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Steven K. Strickland
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April 1, 2014

Mr. Dallas Heltz, Secretary
Arkansas Public Service Commission
P.O. Box 400
1000 Center Street
Little Rock, AR 72201

Re: Docket No. 07-085-TF
In the Matter of the Application of Entergy Arkansas, Inc.
For Approval of Energy Efficiency Programs and Energy
Efficiency Cost Rate Rider

Dear Mr. Heltz:

Please find attached for filing with the Arkansas Public Service Commission, Entergy Arkansas, Inc.'s Energy Efficiency Program Portfolio Annual Report for the 2013 Program Year and the accompanying Program Portfolio Annual Report Excel Workbook. This Annual Report and Workbook are filed pursuant to the provisions of Section 9 of the Commission's Rules for Conservation and Energy Efficiency Programs approved in Docket No. 06-004-R.

If you have any questions or need anything additional concerning this filing, please call me at (501) 377-4457 or Susan Davidson at (501) 377-5720.

Sincerely,

/s/ Steven K. Strickland

SS/sd
Attachments

c: All parties of record w/ attachments

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ENTERGY ARKANSAS, INC.

Arkansas Energy Efficiency Program Portfolio Annual Report

Docket No. 07-085-TF
2013 PROGRAM YEAR

April 1, 2014

APSC FILED Time: 4/1/2014 12:31:55 PM: Recvd 4/1/2014 11:41:33 AM: Docket 07-085-TF-Doc. 443

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1.0 Executive Summary

Since the Arkansas Public Service Commission's ("APSC" or the "Commission") adopted its Rules for Conservation and Energy Efficiency Programs ("C&EE Rules"), Entergy Arkansas, Inc. ("EAI" or the "Company") has developed and offered cost-effective energy efficiency ("EE") programs to all classes of its customers. The 2013 Annual Report provides information on the third, full-program year of EAI's three-year plan of energy efficiency programs approved by the Commission in June 2011. Overall, the Annual Report demonstrates:

- EAI's has successfully increased EE savings through expanded EE programs:
  - EE energy savings of 195,772 MWh of gross (*ex ante*) for the 2013 program year is 3.6 times the 55,058 MWh energy savings for the 2011 program year;[1]
  - EAI achieved savings in 2013 on an adjusted basis of 135% of its Commission's established savings target;[2] and

- Continued growth of the Trade Ally network:
  - This critical element of EE development was virtually non-existent before the C&EE Rules were adopted;
  - The Trade Ally network has grown from about 60 contractors supporting all EAI programs in 2008 to close to 70 in the residential programs and over 170 in the commercial and industrial programs in 2013 through significant training, recruiting, and improved program incentives that help contractors promote the EE measures to customers. As the network has grown, its ability to market EE programs to customers has grown.

The Commission's guidance and direction on EE has enabled and fostered these achievements. However, EAI and other Investor Owned Utilities ("IOUs") must overcome significant challenges to achieve future Commission-established EE goals. These challenges affect the viability of EE programs, which by law must be beneficial to customers and to the utility. These challenges include:

- Retroactive application of deemed savings figures discourages EE expansion, not only for utilities in their program planning and savings projections, but also for vendors and

[1] *See infra* Table 1.1.3 for additional details regarding the figures for this and other program years.
[2] *See infra* Table 1.0.2.

Trade Allies, because of the uncertainty it creates for the savings upon which incentives will be based. For example:

- Significant changes in savings figures recommended by the Cadmus Group, Inc. ("Cadmus"), the independent Evaluation, Measurement, and Verification ("EM&V") consultant engaged by EAI and Southwestern Electric Power Company ("SWEPCO"), could reduce the realization rate to be applied to wall and ceiling insulation provided under EAI's Home Energy Solutions Program by about 40%. EAI will need to change program design, particularly incentive payments for insulation, which will have negative impacts on the contractor's ability to deliver services to customers at 2013 levels. Further, this application of the 40% adjustment suggests that insulation is not as valuable to customers, and program changes to manage cost effectiveness will impact the amount of insulation customers will agree to install in the future.
- For the 2013 program year, retroactive Technical Reference Manual ("TRM") updates continue to negatively affect EAI's energy savings and demand reductions, requiring reductions in program services to customers. Material changes resulting from this retroactive application can be seen particularly in the Lighting and Appliance Program, Home Energy Solutions Program, Multifamily Program, and the Mobile Homes Program.
- For Commercial and Industrial ("C&I") customers, all Custom Program Projects are required to pass cost effectiveness tests prior to acceptance. In 2012, this assessment was conducted prior to the independent evaluations, but that approach resulted in a poor benefit cost analysis. Although EAI and Cadmus developed a process to review custom project information earlier in the EM&V process to better manage the C&I Custom Program's uncertainty, the results of the final EM&V still could not be known with certainty. These final evaluated results produced negative cost effectiveness for certain projects within this program. This will result in reducing the number of projects that qualify for the program and in reducing trade ally participation.

- EAI's low avoided energy cost[3] and other factors continue to drive the benefit cost analysis of the programs lower than originally forecasted in 2011. However, as EAI stated in its 2012 Annual Report, it remains focused on improving the cost

[3] Smith Direct Testimony at 9-10 (April 2, 2012).

effectiveness of its programs despite low avoided cost by identifying and including new cost effective measures, and exploring more cost effective delivery methods. However, four of EAI's programs continue to have negative benefit-cost test results.

- While EAI continues to explore opportunities to coordinate project delivery with natural gas utilities, the allocation of costs between cooperating utilities must be revised. For example, CenterPoint Energy and EAI offer incentives in their residential programs through the Home Energy Affordability Loan ("HEAL") Program, a project of the William J. Clinton Foundation. Yet, when this coordination occurs through the HEAL Program, EAI customers are assessed 100% of the audit costs associated with these efforts, negatively skewing the cost-benefit savings for the joint program.

- Restrictions on budget revisions and delays in Commission approval of interim budget requests have negatively affected EAI's ability to respond rapidly to customer response to programs, either increasing budgets for programs showing a higher than expected level of participation, or cutting back programs that are less successful.

1.1 2013 Program Results and Achievements

For the 2013 program year, EAI achieved 62 MW[4] of evaluated net demand reduction and 203,634 MWh[5] of evaluated net energy savings in 2013.

After independent EM&V adjustments and adjustments resulting from Order No. 17 in Docket No. 10-100-R, EAI's portfolio summary information is shown in the Table 1.0.1 below.

[4] Demand Reduction includes line losses and as calculated by Cadmus.

[5] Energy savings includes line losses as calculated by Cadmus.

Table 1.1.1

Portfolio Summary of 2013 EAI Energy Efficiency Program Results[6]

2013 Portfolio Summary						
Net Energy Savings		Cost			Cost-Benefits	
Demand MW	Energy MWh	Actual Expenses	LCFC	Performance Incentives	TRC Net Benefits	TRC Ratio
57.8	188,468	$ 52,285,262	$ 10,534,980	$3,712,268	$ 67,830	2.11

Incorporating the required adjustments to these savings estimated for the 2013 program year, and then comparing those net figures to EAI's targets (as adjusted to account for the loss of Self Direct ("SD") customers), EAI achieved savings of 135% of its Commission's established savings target, as reflected in Table 1.0.2 below:

Table 1.1.2

Evaluated Savings and Goal Achievement

EAI's Gross Savings (ExAnte)	195,772 MWh[7]
As adjusted by Cadmus and ADM Associates[8] (ExPost)	221,491 MWh
As adjusted for Net-To-Gross ("NTG") and realization rate ("RR") ratios	188,468 MWh
EAI MWh Targets adjusted for SD	139,622 MWh
% of Target Achievement Based on Evaluated Energy Savings	135%

The Commission's initiatives have fostered significant growth in energy efficiency, as reflected in the unadjusted[9] savings that EAI has realized for the program years 2008-2013, which are shown in the Table 1.0.3 below.

[6] Demand and Energy values are prior to inclusion of line losses

[7] Includes average line loss adjustment of 1.0849.

[8] ADM Associates is the independent EM&V consultant engaged by the Joint Utilities to review the Arkansas Weatherization Program ("AWP").

[9] Unadjusted figures provide a good basis for comparing growth of EAI's EE programs because that was the basis upon which the IOUs were required to report their energy efficiency savings prior to the Annual Report for the 2011 Program Year filed April 2012. Note that for the 2012 program year, a significant portion of unadjusted savings were attributed to EAI's Residential Benchmarking Program. Those gross savings were reduced by a realization rate of 16.75%. The Cadmus gross ex ante savings are much larger than program implementers reported.

Table 1.1.3

2008 - 2013 Achieved Energy Savings Unadjusted

		Program Year				
	2008[10]	2009	2010	2011	2012	2013
Gross Energy Savings (MWh)	38,360	48,042	44,251	55,058	130,849	195,772

As EAI has explained in prior annual reports and filings, savings are not the sole measure of growth of EE in Arkansas. Rather, cost-effective EE implementation requires a vendor and contractor network in Arkansas that can support the utilities' programs, and thus, the Commission's initiatives. The sections in this report related to several specific EE programs offered to EAI's customers in the 2013 program year discuss the continued growth of that network, both in quantity and quality of Trade Ally and contractor services. In fact, as a result of this continued growth, EAI had to seek Commission approval to increase the budgets for certain EE programs due to "a significant increase in a number of its EE programs, largely resulting from the programs' capitalizing upon the contractor/vendor network that has been developing in Arkansas since the Commission adopted its C&EE Rules"[11]**.** Ultimately, that request was not approved by the Commission for 2013[12], a result that foreclosed some new contractors from participating in the program. Nevertheless, the remarkable growth of this support network led to Arkansas' being recognized a as leader in EE development in the southeastern United States, as evidenced in the American Council for an Energy-Efficient Economy ("ACEEE") conference in Nashville, Tennessee in 2013.

This most recent recognition is just the latest recognition of the Commission's initiatives and accomplishments. In 2013, EAI was a key panelist specifically at ACEEE, Distributec, and webinars reflecting that EAI is looked upon as a leader within the EE community. The recognition described above, coupled with the evaluation of EAI's third-party EM&V contractor.

[10] 2008 program year energy savings include the last quarter of 2007 program year. The 2007 program year implementation did not start until the last quarter.
[11] Supplemental Testimony of Jeremy Champlin, No. 07-085-TF (August 7, 2013).
[12] Docket No. 07-085-TF, Order No. 88 (October 31, 2013).

The Cadmus Group, Inc. ("Cadmus"), the independent EM&V consultant engaged by EAI and Southwestern Electric Power Company ("SWEPCO"), reflects that EAI is working toward the Commission's overarching goal of having Arkansas' EE programs among the industry's "best in class" programs.

Consistent with prior Commission direction, EAI's efforts to explore opportunities to coordinate with inter-fuel utilities was expanded in 2013, but additional challenges that arose with such efforts are becoming apparent. As reported in 2012, EAI's C&I programs, as well as some programs offered by natural gas utilities, utilize the same implementing consultant, CLEAResult. This has provided the opportunity for C&I customers to receive more comprehensive facility assessments, as well as coordinate program incentives and training benefits. In addition, CenterPoint Energy and EAI continue to work together in their residential programs by offering incentives through the Home Energy Affordability Loan ("HEAL") Program, a project of the William J. Clinton Foundation. Yet, these coordination efforts with CenterPoint highlight one of the purposes of the Weatherization Collaborative established in Docket No. 13-002-U to offer a whole house, weatherization approach for each home[13] and continued guidance on this interaction; EAI customers are assessed with 100% of the audit costs associated with these efforts, skewing the cost benefit savings results for both EAI and CenterPoint. EAI also is promoting the CenterPoint programs on EAI's websites by informing customers while they complete home assessments of CenterPoint's programs. EAI also works with CenterPoint to develop marketing materials that promote both companies' programs with a single mailing or handout for trade shows and contractors. Further, in 2013 the Commission approved the SourceGas Home Energy Solutions Program that was specifically designed to coordinate and work together as a whole house intra-fuel program for EAI and Southwestern Electric Power Company ("SWEPCO"). EAI continues to explore opportunities to partner with intra-fuel utilities to improve whole-house approaches for implementing energy efficiency as part of the Weatherization Collaborative established by the Commission in order to achieve a cost-effective, unified, weatherization approach.

The opportunities for C&I customers to qualify to Self-Direct ("SD") energy efficiency programs continues to present challenges for success of EAI's C&I programs. The number of self-direct customers has increased since the Arkansas Legislature's Act 253 of 2013 became effective. Challenges presented by the SD process include limiting the available market of customers for

[13] Docket No. 13-002-U, Order No. 1 at 45.

EAI's EE programs, with the programs focusing on those customers contributing the largest portion of savings to EAI's portfolio as reflected in the CADMUS report, as well as creating dissatisfaction among Trade Allies who respond to inquiries from SD customers who appear ultimately to have no interest in program participation and are merely seeking evidence to support their SD application. EAI continues to promote the C&I programs, but must also make the customers aware of the SD option and the associated restrictions on the customer's future ability to participate in the EAI programs. This risk typically results in a customer questioning the value of participating in the EAI programs. Accordingly, EAI will continue to monitor SD activity to determine the viability of these C&I programs as the pool of potential participants shrinks. Despite these challenges, EAI has had the most successful year helping industrial and commercial customers reduce their energy usage with cost effective energy efficiency.

While EAI remains focused on offering cost-effective EE programs to its customers, EAI's low avoided energy cost,[14] among other factors, continues to drive the benefit cost analysis of the programs lower than EAI originally forecasted in 2011, similar to what EAI discussed in its Annual Report for the 2012 program year. Accordingly, EAI remains focused on improving the cost effectiveness of its programs during this time of low avoided cost by identifying and including new cost effective measures, and exploring more cost effective delivery methods. Additionally, EAI improved its benefit cost analysis methodology and methods to measure savings, increasing the cost effectiveness of most of its offered programs. However, three of EAI's programs continue to have negative benefit-cost test results. The New Homes Program had poor cost effectiveness in 2013 because of the slow new home construction market. Further, builders have been reluctant to participate due to the cost associated with the higher Energy Star® building standards. EAI will implement prescriptive and Pay for Performance components as a program change starting in 2014 to encourage builders to take small steps toward building more efficient homes in order to move toward meeting Energy Star® Homes standards. This approach will encourage builders already meeting the Energy Star® standards to increase further the efficiency of the new homes they construct.

The Multifamily and the Manufactured Homes programs also did not have a positive benefit cost result. Both of these programs are in hard-to-reach markets, which require more marketing (customer recruitment) cost and direct installation of measures, which in turn increases costs. When these higher customer recruitment costs are coupled with changing TRMs for measures

[14] Smith Direct Testimony at 9-10 (April 2, 2012).

being installed,, it becomes very difficult to find ways to improve cost effectiveness. The TRM changes in the fall of 2013 offset EAI's program adjustments and benefit cost analysis changes intended to make these programs cost effective. EAI will try another year to determine if it can provide cost-effective EE programs to the hard-to-reach markets.

The Residential Benchmarking Pilot Program was the last program not have a positive cost effectiveness. Part of the pilot was to determine what persistent verifiable energy savings and demand reductions could be achieved[15]. These energy savings and demand reductions are the core inputs to determine this programs cost effectiveness. In 2012 and 2013 the TRM protocol J was developed to determine the methodology to verify energy savings and demand reduction. The 2013 achievements have determined that the program is not cost effective. Therefore EAI will continue to explore how the program can be modified to result in positive cost effectiveness in 2014.

1.2 Expanded Discussion of Retroactive Impacts to EE Programs

As discussed in previous annual reports, retroactive adjustment of EE savings from both TRM updates and independent EM&V remains an issue prohibiting further growth of EE in Arkansas. Application of retroactive adjustment is producing Trade Ally frustration, increases in program cost, particularly database and field data collection cost; and reductions in benefit cost results that are not realized until after the programs and associated measures are pursued and implemented. Specifically, retroactive adjustments of 2013 energy savings and demand reduction produced these specific results for EAI:

1) Increased data collection and database cost (with direct financial costs of approximating $265,000 for EAI). In addition to these direct costs, intangible costs associated with diverting manpower from proactive support and development of participant projects to implementing program adjustments and the associated results for those retroactive adjustments. Although these intangible costs are difficult to quantify, the material impact of retroactive adjustments and the uncertainty it creates in planning and reporting for EE programs, particularly in planning for goal attainment.
2) EAI and Cadmus developed a process to help Cadmus begin evaluations earlier in the year to help EAI manage the retroactive adjustment risk better. As a result of this effort

[15] Entergy Arkansas, Inc., 2011-2013 Energy Efficiency Program Plan, Docket No. 07-085-TF, At 72 (March 1, 2011).

and in general, the large C&I custom projects performed better from an evaluated demand reduction and energy savings perspective where they were analyzed using engineering analysis and measurements and verification ("M&V") plans reviewed by the independent evaluators prior to starting the custom projects. Those efforts enabled EAI and the C&I customers to make better decisions with custom projects, and Cadmus had more time to understand the custom project earlier and provide guidance as to how EAI's custom project M&V could improve. While this approach for managing the uncertainty in custom programs was helpful, some specific customer projects did not provide the demand response and energy savings originally anticipated. As a result, EAI will need to adjust the future custom project cost effectiveness threshold (as calculated using the Total Resource Cost ("TRC") to manage the cost effectiveness for this program. As a result, EAI will see a reduction in the number of C&I customers who are able to participate in EAI's 2014 programs, reducing the opportunity for EAI to attain the Commission's energy savings targets.

3) For the 2013 program year, retroactive TRM updates continues to negatively affect EAI's energy savings and demand reductions, a result that requires adjustments that reduce program services to customers. Material changes resulting from this retroactive application can be seen particularly in the Lighting and Appliance Program, Home Energy Solutions Program, Multifamily Program and the Mobile Homes Program.

4) One of the most significant changes EAI has seen in its 2013 program year results is associated with retroactive adjustment proposed by EAI's third party EM&V contractor, Cadmus. As part of its EM&V analysis, Cadmus conducted a billing analysis based upon 2011 and 2012 houses that received incentives from the Home Energy Solutions Program ("HES"). The result of the billing analysis indicated that HES RR would be 61%, meaning that the anticipated savings associated with measures installed under EAI's HES program during that time appeared to achieve only 61% of the anticipated savings based upon analysis of customer bills. Given that the predominate measure in the 2011 through 2012 program years were ceiling and wall insulation (over 90%), Cadmus' analysis gives the impression that wall and ceiling insulation's value as an energy efficiency measure is much less than the value provided within the TRM and of questionable valuable for customers and utilities as a EE measure. The result of Cadmus' analysis was made known only 4 weeks prior to this annual report filing. With only limited time to review and assess Cadmus' analysis, EAI remains concerned

regarding application of that analysis to EAI's 2013 program year results. Some of EAI's concerns include:

(a) Cadmus' findings should be limited to EAI's HES program or applied more broadly to all programs, including the Arkansas Weatherization Program ("AWP"), that achieve savings primarily through wall and ceiling insulation. Should this analysis be considered appropriate by the Commission, then EAI's point of view is that residential insulation is quickly becoming of little to no value for both customers and utilities as part of a cost effective energy savings measure in any energy efficiency program. As ceiling and wall insulation becomes non-cost effective the Unified Weatherization Programs' cost effectiveness may be negatively impacted as well.

(b) Because the 2013 mix of installed measure for EAI's HES program was much different than previous years (2013 insulation was slightly over 30% of the HES measure mix), CADMUS agreed that the RR of 61% should only be applied to insulation. Even with this limited application, Cadmus reviewed the measure energy saving based upon the TRM calculation and confirmed that RR based upon the TRM was close to 1. This result demonstrates that EAI has managed the program implementation and cost effectiveness very well based upon best available information. However, applying this RR to EAI's, and possibly other utilities', programs presents the Commission with an issue as to whether wall and ceiling insulation are cost effective measures for Arkansas.

(c) Changes to the estimated measure savings recommended by Cadmus affects EAI's savings not only 2013 calendar year program but also more than 50% of savings in 2014 as well. While the program remains cost effective, the cost effectiveness is significantly diminished by this retroactive adjustment. EAI presently has no program recommendations for the HES program due to the timing of its receipt of this information and the uncertainties discussed, leaving EAI's planning and implementation at the mercy of these retroactive adjustments.

(d) Immediate direction from the Commission is needed by EAI and other utilities regarding how to estimate EE savings for wall and ceiling insulation today. EAI presently uses the TRM methodology with the current program to estimate energy savings and to offer appropriate customer incentives. The TRM cannot be updated until later this year and only after additional review and analysis of the TRM is completed. This recommendation has come outside of the TRM process, rendering

the TRM results as suspect without any indication of what the resulting energy savings values will be used.

(e) EAI must plan to reduce the uncertainty for both our customers and our owners and to ensure cost-effectiveness of the HES program, recognizing there is virtually no certainty for planning purposes as to the value of this measure. Nevertheless, EAI will begin to explore options for wall and ceiling insulation to continue to be included within EAI's EE program and portfolio measures mix. If EAI concludes this measure cannot be cost-effectively maintained in its portfolio of programs given the significant reduction in the RR (and thus the savings), then that conclusion will hinder EAI's ability to meet the comprehensive checklist factor 3 (major end uses addressed), comprehensiveness checklist factor 4 (comprehensively addressing customer needs), and comprehensive checklist factor 6 (in a cost effective manner) for residential EE programs in future portfolios and could result in EAI's inability to achieve Commission targets in the future.

To better understand EAI's 2013 program year achievements, as well as the growth of EE that the Commission has fostered with its C&EE Rules, a review of the 2102 Annual Report will provide details of the EAI programs achievements, barriers and issues since the start of quick start programs through the year end 2012[16]. The subsequent sections of this summary provide a review of the 2013 results and the projections for 2014, including the opportunities for improving EAI's programs and the Commission's framework generally.

1.3 EAI's 2013 Program Year results and 2014 program changes and goals

With another full year available for implementation of EAI's comprehensive programs from its three-year plan approved by the Commission, EAI achieved a significant increase in the demand and energy savings from prior years. EAI's overall results for program year 2013 are shown in Table 1.1.1 below:

[16] Docket No. 07-085-TF, Entergy Arkansas Energy Efficiency Program Portfolio Annual Report 2012 Program Year April 8, 2103, Executive Summary.

Table 1.3.1

EAI 2013 Results

EAI's Gross Savings	195,772 kWh
As adjusted by Cadmus and ADM Associates (ExPost)	221,491 kWh
As adjusted for NTG and RR ratios[17]	188,468 kWh

Indeed, Cadmus' Evaluation Report recognized EAI's continued growth in its 2013 program year report (provided in Appendix A), stating:

> EAI's energy-efficiency portfolio includes 14 programs offering a comprehensive range of energy-efficiency, demand reduction, and educational options for every customer sector. EAI designed its programs to provide customers with easy program entry points, flexible options for saving energy, and ongoing support for participants who want to pursue deeper energy savings.[18]

Cadmus provided additional details on this point, stating:

> EAI's portfolio of 14 programs provides a comprehensive range of energy-efficiency, demand reduction, and educational options for every customer sector. The portfolio's objectives include:
>
> - Varied programs targeting energy efficiency, demand reduction, and conservation;
> - Options at a technology or whole-building level;
> - A wide range of incentives for installing individual technologies or building upgrades, conserving energy through behavioral modification, maintaining equipment, and/or obtaining energy-efficient educational services (e.g., audits);
> - Solutions for existing and new construction; and
> - Robust contractor and vendor networks to support program delivery.
> - Achieving broad ratepayer benefits as outlined in the APSC C&EE Rules. These benefits include: generating energy, demand, and energy cost savings; improving reliability and energy security; generating environmental and economic benefits; and implementing programs efficiently.
> - Achieving comprehensiveness as described in the APSC's *Comprehensiveness Checklist*.

[17] Energy Savings do not include transmission and distribution line losses.
[18] Cadmus Energy-Efficiency Portfolio Evaluation Report 2013 Program Year at 21.

All of EAI's programs were available in 2013 for retail customers and achieved various levels of success. Of the 16 programs within EAI's portfolio, 12 of those programs met or exceeded planned energy savings: the Efficient Cooling Solutions Program, C&I Custom Program, the City Smart Program, the Small Business Program, the Residential Benchmarking Pilot Reward Program, the Energy Solutions for Multifamily Homes DI Program, the Energy Solutions Program for Manufactured Homes, the Agricultural Energy Solutions program, the residential Direct Load Control Program, the Residential Home Energy Solutions Program, and the Lighting & Appliances Program. One program, the Energy Efficiency Arkansas Program, is an education program that does not provide any energy savings.

The programs that did not achieve the anticipated level of savings were the Arkansas Weatherization Program, the Energy Star® New Homes Program, the Agricultural Irrigation Load Control Program, and the C&I Prescriptive Program. The reasons for these programs' underachievement will be discussed in more detail in each respective program discussion within this document and within the Independent EM&V Contractor Report, Appendix A.

In 2012, the first year of a full evaluation, Cadmus made 188 recommendations for program changes to either enhance program performance or program reporting. EAI was able to incorporate 144 of those recommendations and is still in the process of incorporating 30 of those recommendations in 2013, without incremental cost. Seven of those recommendations are either no longer applicable or ones that EAI considered inappropriate to incorporate. Accordingly, EAI places higher priority on the recommendations in process for completion.

In 2014 Cadmus provided EAI with 14 new recommendations to consider. EAI plans to work with CADMUS to ensure the Company's understanding of these recommendations and then incorporate into future programs based upon the potential positive impact for EAI customers compared to the cost.

In 2013, the Commission has awarded 25 of EAI's customers representing 205 accounts a SD Certificate for the 2013 program year. EAI's energy savings goals, as reported in the 2011 EAI Annual Report, are shown on Table 1.1.2 below, with and without the SD adjustment:

Table 1.3.2

EAI's 2013 Energy Savings Goals

Original 2013 Goal (MWh)	158,119
Adjustment due to SD (MWh)	18,497
New 2013 Goal (MWh)	139,622

Consistent with the treatment of SD customers for 2013, EAI has adjusted its 2014 goals to include the incremental 6 customers representing 72 accounts for which SD certificates have been granted. These incremental customers summed to those existing SD customers results in a total of 28 SD customer representing 277 accounts. Accordingly, for 2014, the overall targets are reduced by 12% as a result of these SD approvals, and all of the incremental SD customers were manufacturing customers. Based upon EAI's assessment and to preserve its ability to meet 2013 C&I Program goals, EAI does not propose to modify the C&I EE program budgets or the energy savings reductions for 2014.[19] The 2014 goals, then, and the associated adjustments are shown in Table 1.1.3:

Table 1.3.3

EAI's 2014 Energy Savings Goals

Original 2014 Goal (MWh)	158,119
Adjustment due to SD (MWh)	19,091
New 2014 Goal (MWh)	139,028

Next year, EAI will consider whether program modifications are needed for 2015 based upon 1) the 2015 SD Program[20] results, 2) the independent evaluation results driving poor benefit cost analysis of C&I Programs, and 3) the outcomes of Docket No. 13-002-U, Order No. 1.

The gross savings for all programs reported in this document were calculated using the TRM Deemed Savings and Protocols as adjusted by the Joint Recommendations of the Independent

[19] EAI will need to continue to monitor SD impacts are known as a result of the new SD Legislation passed and implemented in 2013.

[20] Recent legislation has increased the uncertainties regarding the magnitude of Industrial customers that will chose to SD.

Monitor ("IEM") and the PWC and approved by the Commission[21] or where appropriate, utilized an International Performance Measurement & Verification Protocol ("IPMVP") approved method.

As indicated earlier, EAI's reported net savings reflect the final results of the independent EM&V analysis performed by Cadmus and ADM Associates. Cadmus' EM&V Report for EAI's 2013 results is attached as Appendix A, and ADM Associates' EAI Report is included in the Arkansas Weatherization Program Annual Report.

1.4 Cost benefit results

EAI performed a benefit cost analysis in connection with these results, using the same modeling approaches that were used to evaluate programs in the 2011 Annual Report, including time-of-day analysis.[22] The avoided demand and energy costs were updated using the same market approach discussed in EAI's Annual Report for the 2013 program year.[23] In addition, the 2013 program cost, demand reduction, energy savings, and measure lives were updated to reflect 2013 results.

Low avoided energy cost,[24] among other factors, continues to be a challenge to identifying cost effective programs. However, even with these barriers, overall cost effectiveness was better than for EAI's original portfolio in 2011.[25] Accordingly, EAI has focused on improving the cost effectiveness of its programs during this time of low avoided cost by identifying and including new measures, exploring more cost effective delivery methods, and identifying improvements in benefit-cost analysis methodology and measurement of savings consistent with those methods used by numerous other utilities. EAI's efforts improved the cost effectiveness of many of its offered programs. The C&I Custom Program, Agricultural Irrigation Load Control, and Agriculture Energy Solutions moved from a negative benefit cost in 2012 to a positive benefit cost in 2013.

---

[21] Docket No. 10-100-R, Order No. 17 (September 18, 2012). The 2012 programs were developed on deemed savings that were in place during program plan filing on 2011. The energy savings in 2013 were using the 2012 TRM update for calculation savings throughout 2013 and all measure savings calculations were required to be recalculated after the 2013 TRM update in September 12, 2013.

[22] EAI's benefit-cost analysis method involves a more in-depth analysis of the hours (e.g., on peak v. off peak) in which the expected energy savings likely would be realized.

[23] Docket No. 07-085-TF, Entergy Arkansas, Arkansas Energy Efficiency Program Portfolio Annual Report 2012 Program Year at 95 -96 (April 8, 2103).

[24] Champlin Direct Testimony at 10 (April 8, 2013).

[25] Docket No. 07-085-TF, EAI Exhibit 1 Energy Efficiency Programs Plan For 2011-2013 Program Years at 9.

Programs that did not result in a favorable benefit cost for 2013 include Energy Solutions for Manufactured (Mobile) Homes Program, Residential Benchmarking Pilot Program, Energy Star® New Homes Program, and Manufactured Homes Program. However, these results must be placed into context. Low avoided energy cost continues to drive poor cost effectiveness. Other factors also influence these results. For example, the Energy Star® New Homes Program commenced during some of the lowest economic times for new homes starts and could not deliver savings due to those poor market conditions. The Multifamily and Manufactured Homes Program were significantly impacted by the retroactive adjustment of the TRM V3.0. The Residential Benchmarking Pilot Program cost effectiveness test was also negative. Part of the pilot was to determine what persistent, verifiable energy savings and demand reductions could be achieved[26]. These energy savings and demand reductions are the core inputs to determine this programs cost effectiveness. Now that verification of energy savings and demand reductions through the development of protocol J of the TRM, EAI will focus to determine if the program can be implemented in a cost –effective manner. Consistent with the Commission's approach to taking a long-term view for its EE initiatives, EAI's decision of whether to discontinue a program with a negative benefit assessment is not be based upon results from a single program year. If the program has the potential to become beneficial over time, the program is allowed sufficient time to demonstrate its economic viability.

However, all Custom Program Projects are required to pass cost effectiveness tests prior to acceptance. In 2012, this assessment was conducted prior to the independent evaluations and as reported in the 2012 "Arkansas Energy Efficiency Program Portfolio Annual Report,"[27] that approach resulted in a poor benefit cost analysis. As discussed earlier, EAI and CADMUS developed a process to review custom project information earlier in the EM&V process to better manage the C&I Custom Program's uncertainty. This process had Cadmus review the customer's proposed project in advance, with the opportunity to provide comments and advice on the program's custom M&V plans prior to the customer's making a final decision to pursue the project based upon incentives offered by EAI. If Cadmus' preliminary review determined the project to be an acceptable approach, then TRC benefit cost tests were completed to determine if the custom project would be cost effective. While this process improved the benefit-cost results compared to 2012, the results of the subsequent independent evaluation could not be

[26] Entergy Arkansas, Inc., 2011-2013 Energy Efficiency Program Plan, Docket No. 07-085-TF, At 72 (March 1, 2011).
[27] This report may be found at http://www.apscservices.info/pdf/07/07-085-Tf_383_1.pdf.

known by EAI or the customer because the EM&V is based upon final filed data or customer planned operations changed. These final evaluated results produced negative cost effectiveness for certain projects within this program.

While growing the C&I Custom Program is desirable, the circumstances that arose with the evaluated results of 2012 and again in 2013, require EAI to modify its approach to this program. Even with the preliminary review process implemented in 2013, Cadmus identified several with poor realization rate ratios after their preliminary analysis. Cadmus' field evaluations yielded lower energy savings achievement than were anticipated in the M&V conducted on the front-end.

Therefore, for the 2014 program year, EAI is planning to supplement the preliminary process developed in 2013 to provide additional focus on benefit-cost criteria in an attempt to manage cost effectiveness of this program by further assuring that the preliminary evaluation of results is more consistent with the final evaluated results. However, EAI must note that this more conservative analysis likely will result in fewer cost effective custom projects, and accordingly, this approach will likely reduce the ability of EAI to achieve the planned program savings in the future.

EAI integrated into the Midcontinent Independent Transmission System Operator ("MISO")[28] Regional Transmission Organization ("RTO") in December 2013. EAI took additional time in 2013 to test and adjust its demand response programs in preparation for that move to MISO. EAI successfully registered the Residential Load Control Program, also known as Summer Advantage Program, as a Load Modifying Resource[29] ("LMR") in MISO. EAI also successfully registered the Agricultural Irrigation Load Control Program ("AILC") after much work to determine how to change the AILC interruption schedules to accommodate the MISO curtailment and M&V requirements. The move to MISO will affect the level of demand reduction for demand response programs reported in future years. EAI's focus is on the value of these resources in MISO planning and M&V approaches. The MISO M&V planning involves different

[28] MISO is an essential link in the safe, cost-effective delivery of electric power across all or parts of 15 U.S. states and the Canadian province of Manitoba. As a RTO, MISO assures consumers of unbiased regional grid management and open access to the transmission facilities under MISO's functional supervision.

[29] Definition of LMR is in the MISO Demand Response Business Practice Manual, beginning on page 19 of the PDF file. Manual can be found at:
https://www.misoenergy.org/Library/BusinessPracticesManuals/Pages/BusinessPracticesManuals.aspx

methods on establishing the baselines for curtailments and in general, results in more conservative demand reduction for reporting. The amount of demand reduction based upon past M&V has not changed, only the calculation method.

The costs and benefits of several of EAI's programs, particularly when compared to the benefit cost analysis originally presented in EAI's Three-Year Plan, also have been affected by the application of the new method of applying updated avoided costs and measure life changes in the updated TRM, both positively and negatively. The updated benefit-cost analyses presented in this report depends upon the final evaluated numbers from the independent evaluator, which were not received until weeks before this filing. As a result, EAI had the opportunity to discuss with Cadmus preliminary evaluation results prior to finalizing the final report, but EAI did not have time to consider the benefit-cost results in assessing the portfolio changes addressed throughout this report. Thus, while EAI identifies the programs changes it anticipates for 2014 throughout this report, EAI will continue to evaluate the need for changes to its portfolio so that it can continue to work towards reaching the Commission's savings targets in a cost-effective manner.

1.5 2013 Budgets and Changes

The 2013 program year budget was originally approved on June 30, 2011 by the Commission and updated as part of the 2013 Energy Efficiency Cost Rate Rider ("EECR") update to an overall portfolio cost of $53,032,000.00. In 2013, EAI revised the approved budget within the Commission's budget flexibility guidelines and moved budgeted dollars from under-achieving programs to programs with positive market acceptance. The details of the revised budget are in Table 1.3.1. No program had more than 10% of its budget reduced, and the total portfolio budget remained within the 10% limit.

Table 1.3.1

Revised 2013 Budgets[30]

[30] The APSC approved the ABudget in Order No. 40 in Docket No. 07-085-TF.

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Budget Reconciliation Table

	Program Name	RBudget	Abudget*	Difference	Change	Explanation for the Change
1.	Lighting & Appliances	$ 4,002,702	$ 4,447,447	$ (444,745)	-10%	Moved $444,745 budget dollar from Lighting and Appliances Program to Home Energy Solutions Programs allowed under approved 2013 budget flexibilityrules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
2.	Home Energy Solutions	$ 8,659,482	$ 4,329,741	$ 4,329,741	100%	Moved budget dollars as allowed under approved 2013 budget flexibility . Removed from lighting and Appliances Program $444,745, New Homes Program, $53,123, Residential Load Control Program $341,712, Arkanas Weatherization Program $127,925, CitySmart Program $290,176, Agricultural Energy Solutions Program $64,173 and Agricultrual Irrigation Load Control Program $413,053. The sum of these budget reallocatoins total $1,734,907 resulting in an increased balance of $2,594834. The remaining increased balance did not increase the portfolio budget be more than 10% . Resulting in EAI satying within the budget flexibility rules of no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
3.	Efficient Cooling Solutions	$ 2,767,162	$ 2,406,228	$ 360,934	15%	Increased budget dollars by 360,934 as allowed under approved 2013 budget flexibility . Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
4.	Energy Solutions for Multi-Family	$ 575,128	$ 426,021	$ 149,107	35%	Increased budget dollars by 149,107 as allowed under approved 2013 budget flexibility rules. Moved Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
5.	Energy Solutions for Manufactured Homes	$ 936,575	$ 836,228	$ 100,347	12%	Increased budget dollars by $100,347 as allowed under approved 2013 budget flexibility rules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
6.	Energy Star New Homes	$ 478,107	$ 531,230	$ (53,123)	-10%	Moved $53,123 budget dollars from Energy Star New Homes into Home Energy Solutions as allowed under approved 2013 budget flexibility rules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
7.	Residential Benchmarking Pilot	$ 1,487,462	$ 1,487,462	$ -	0%	
8.	Residential Direct Load Control	$ 3,075,405	$ 3,417,117	$ (341,712)	-10%	Moved $341,712 budget dollars from Residential Load Control Prgram into Home energy Solutions Program as allowed under approved 2013 budget flexibility rules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
9.	Arkansas Weatherization Program	$ 1,151,326	$ 1,279,251	$ (127,925)	-10%	Moved $127925 budget dollars from Arkansas Weatherization Program into the Home Energy Solutions Program as allowed under approved 2013 budget flexibility rules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
10.	Energy Efficiency Arkansas	$ 232,040	$ 232,040	$ -	0%	
11.	C&I Prescriptive	$ 11,660,532	$ 12,956,146	$ (1,295,615)	-10%	Moved $1,295,615 from C&I Perscriptive Program into C&I Custom Program as allowed under approved 2013 budget flexibility rules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
12.	C&I Custom Solutions	$ 14,732,537	$ 11,332,721	$ 3,399,816	30%	Moved $1,295,615 from C&I Persscriptive into C&I Custom as allowed under approved 2013 budget flexibility rules.
13.	Small Business	$ 1,760,575	$ 1,676,738	$ 83,837	5%	Increased by $83,837 budget as allowed under approved 2013 budget flexibility rules. Did not exceed the 10% flexibility at portfolio budget level as provided in Docket 07-085-TF, Order No. 84
14.	City Smart	$ 2,611,588	$ 2,901,764	$ (290,176)	-10%	Moved $290,176 budget dollars from City Smart into Home Energy Solutions as allowed under approved 2013 budget flexibility rules. Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
15.	Agricultural Energy Solutions	$ 577,559	$ 641,732	$ (64,173)	-10%	Moved $64,173 budget dollars from Agricultrual Energy Solutions Programs into Home Energy Solutions Program as allowed under approved 2013 budget flexibilityrules . Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
16.	Agricultural Irrigation Load Control	$ 3,717,478	$ 4,130,531	$ (413,053)	-10%	Moved budget dollars as allowed under approved 2013 budget flexibility . Remove no more than 10% per program and not increase portfolio over 10% Docket 07-085-TF, Order No. 84
	Total Portfolio:	$ 58,425,658	$ 53,032,398	$ 5,393,260	10%	

Anticipated program modifications for the 2014 program year

As was the case for the 2013 program year, EAI is proposing program modifications for the 2014 program year that differs from the original three-year plan approved in June of 2011. The changes are driven predominately by market experience, but also reflect input from independent EM&V consultants. The changes include the following:

Program	Incremental Dollar Change	Comment
Home Energy Solutions	None	With the significant change in the evaluated energy savings based upon billing analysis, EAI will begin moving away from ceiling and wall insulation as significant measure within this program. EAI is hopeful but not confident that 2014 program targets can be met with this change.
Agricultural Irrigation Load Control	None	EAI has identified new technology that can provide all the functions of the legacy equipment but with the potential for increased reliability and reduced cost. EAI is planning to test this new technology to verify it can be integrated into the operation of the legacy technology so that the legacy equipment can perform through its useful life. No increase in program cost is anticipated for this test.
C&I Energy Solutions	None	Based upon the last 2 years of independent EM&V experience, EAI will change the TRC criteria to improve the management of cost effectiveness of this program. The hurdle for a custom project will become higher, thus more difficult for customer's custom projects to be included in this program. The expected impacts are that some projects that have been installed in the past within this program will likely not be in the future, thus reducing the opportunity to meet program energy savings achievement.
Energy Star® New Homes	None	EAI will modify this program to also include incentives for prescriptive measures in an attempt to increase builder participation in a very difficult new homes market.

EAI developed its database[31] in 2012-and enhanced in 2013 with collaborative meetings that included independent evaluators, program implementers, database providers, and members of EAI's EE staff, and Information Technology Department. The EAI database was available in

[31] Arkansas Technical Reference Manual, Volume 1, Version 2: EM&V Protocols, PROTOCOL A: Program Tracking and Database Development.

2013 and used to inform the independent evaluator of *post–ante* energy savings and demand reductions. As commonly seen with any database that requires significant updates and changes associated with retroactive adjustments to be implemented in short time frames, some errors were reported by the independent evaluator. However, fewer database concerns were identified within the 2014 evaluator review period , and EAI anticipates more improvement as it continues to work to improve its database reporting.

Consistent with prior Commission direction, EAI's efforts to explore opportunities to coordinate with intra-fuel utilities was expanded upon in 2012 and continued in 2013. The coordination is occurring on residential, large commercial, and industrial programs between EAI and overlapping natural gas customers. As examples, EAI's C&I Programs, as well as some programs offered by EAI's gas utility counterparts, utilize the same implementing consultant, CLEAResult. This has provided the opportunity for C&I customers to receive more comprehensive facility assessments, as well as coordinate program incentives and training benefits. Two hundred fifteen Commercial and Industrial projects received the benefit of coordination between EAI and natural gas utility programs in 2013. Within the Home Energy Solutions Program, EAI and CenterPoint have been working together through the Clinton Foundation Home Energy Affordability Loan ("HEAL") program since 2011. In 2013, EAI and SourceGas' worked together on a Home Energy Solutions Program after the SourceGas program was approved in September 2013. One hundred fifty-eight homes received coordinated services between EAI and SourceGas in 2013 even with the late approval of SourceGas program.

As noted previously, the residential programs continue to work together by offering incentives through the HEAL Program. In 2013, SourceGas obtained APSC approval to offer a Home Energy Solutions Program that was specifically design to coordinate with EAI's and SWEPCO's residential programs. EAI continues to extend opportunities to intra-fuel utilities to improve whole-house approaches for improving energy efficiency.

Another point of coordination is the Direct Install ("DI") offerings, in which EAI and the partnering gas utilities have co-branded marketing pieces for outreach of DI opportunities to large and small C&I customers. EAI Promotes both gas and electric energy efficiency opportunities as applicable. Many customers have received DI offerings from both gas and electric utilities at the

same site. EAI and gas utilities have partnered for training events and have worked to include marketing materials from the intra-fuel utility programs during site visits.

In addition to the changes listed above, EAI proposes to continue expanded programs as approved for 2014,[32] subject to EAI's ongoing evaluation of the need for changes discussed previously.

EAI filed an Integrated Resource Plan ("IRP") in 2012, wherein EAI assessed the viability of several long-term planning options, including one that focused upon continued expansion and pursuit of cost effective and achievable energy efficiency in Arkansas. The IRP forecast projected that, by 2023, EAI would achieve 700 MW of cumulative peak demand reduction and 1,788,584 cumulative MWh of energy savings, with an estimated $750 million in accumulative expenditures required to achieve those results. The 2012 IRP demonstrated that the demand side management scenario evaluated favorably against other potential options under most of the scenario assumptions modeled.

The barriers to successful achievement of the energy efficiency targets within the IRP, in large part, are driven by the uncertainties that are beyond EAI's control. These include continued customer acceptance, timing and magnitude of an economic recovery in Arkansas, continued Trade Ally participation, especially as programs are changing so frequently due to retroactive adjustments and regulatory program design changes; regulatory and state policy changes, and retroactive EM&V and TRM changes. To illustrate the customer acceptance impacts, consider the recently passed legislation designed to simplify the SD process in response to many customers' desire to control the costs and decisions regarding EE implementation. Examples of additional uncertainties include changes in energy efficiency policy. For example, multiple orders in Docket No. 13-002-U include proposals that create significant uncertainties for programs beyond 2014, such as avoided cost methodology changes, program design changes as a result of unified weatherization, unified commercial and industrial programs, program impacts associated with reduced budget flexibility, approval for increased program budgets required to expand the programs, Trade Ally and contractor networks reactions to Commission changes in policy ,and timely expansion approval as demonstrated in EAI's 2013 program expansion request and the continued uncertainty associated with independent EM&V results and their effects. Other uncertainties affect program planning and efforts to achieve cost

[32] Order No. 88 at 10.

effectiveness, including the current low level of the avoided cost and the retroactive application of EM&V revisions.

The following three tables are from the tabular report workbook tables as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

- "EE Portfolio Summary by Program" from workbook table 2, Table 1.5.2 below
- "EE Portfolio Summary by Cost Type" from workbook table 3, Table 1.5.3 below
- "Company Statistics" from workbook table 4, Table 1.5.4 below

Table 1.5.2

EE Portfolio Summary by Program

EE Portfolio Cost by Program					
			2013		% of Budget
Program Name	Target Sector	Program Type	Budget ($)	Actual ($)	
Efficient Cooling Solutions	Residential	Measure/Technology Focus	2,767,162	2,758,468	100%
Energy Solutions for Manufactured Homes	Residential	Market Specific/Hard to Reach	936,575	935,574	100%
Energy Solutions for Multi-Family	Residential	Market Specific/Hard to Reach	575,128	573,725	100%
Energy Star New Homes	Residential	New Construction	478,107	398,544	83%
Home Energy Solutions	Residential	Whole Home	8,659,482	8,493,070	98%
Lighting & Appliances	Residential	Consumer Product Rebate	4,002,702	3,133,611	78%
Residential Benchmarking Pilot	Residential	Behavior/Education	1,487,462	1,528,523	103%
Residential Direct Load Control	Residential	Demand Response	3,075,405	3,312,919	108%
C&I Custom Solutions	Commercial & Industrial	Custom	14,732,537	14,525,835	99%
C&I Prescriptive	Commercial & Industrial	Prescriptive/Standard Offer	11,660,532	8,005,269	69%
City Smart	Commercial & Industrial	Market Specific/Hard to Reach	2,611,588	2,675,130	102%
Small Business	Small Business/C&I	Market Specific/Hard to Reach	1,760,575	1,784,952	101%
Agricultural Energy Solutions	Agriculture	Prescriptive/Standard Offer	577,559	491,796	85%
Agricultural Irrigation Load Control	Agriculture	Demand Response	3,717,478	3,137,809	84%
Arkansas Weatherization Program	Residential	Whole Home	1,151,326	298,394	26%
Energy Efficiency Arkansas	Residential	Other	232,040	231,644	100%
Hide	-	-	-	-	-
Regulatory	-	-	-	-	-
		Total	**58,425,658**	**52,285,262**	**89%**

Table 1.5.3

EE Portfolio Summary by Cost Type

EE Portfolio Summary by Cost Type				
EE Program Cost Summary	**2013 Total Cost**			
Cost Type	**% of Total**	**Budget ($)**	**Actual ($)**	**% of Total**
Planning / Design	0%	271,029	3,390	0%
Marketing & Delivery	35%	20,658,383	19,047,624	36%
Incentives / Direct Install Costs	58%	33,929,606	29,116,373	56%
EM&V	3%	1,750,651	2,116,185	4%
Administration	3%	1,815,989	2,001,690	4%
Regulatory	0%	-	-	0%
	100%	**58,425,658**	**52,285,262**	100%

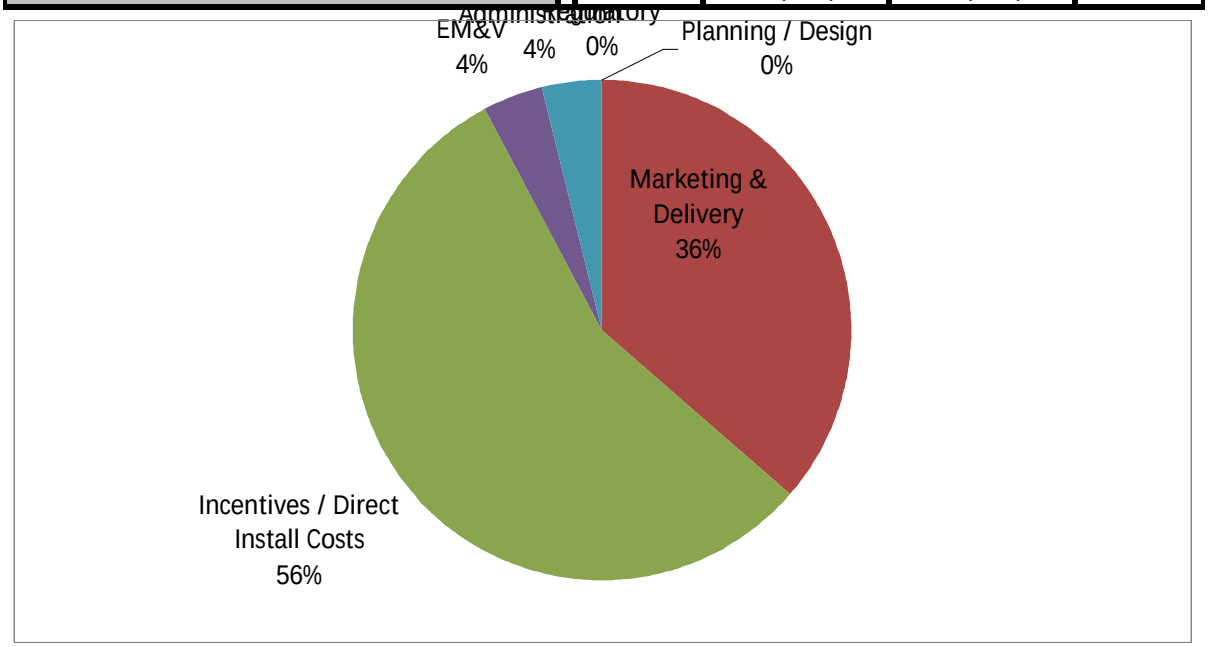
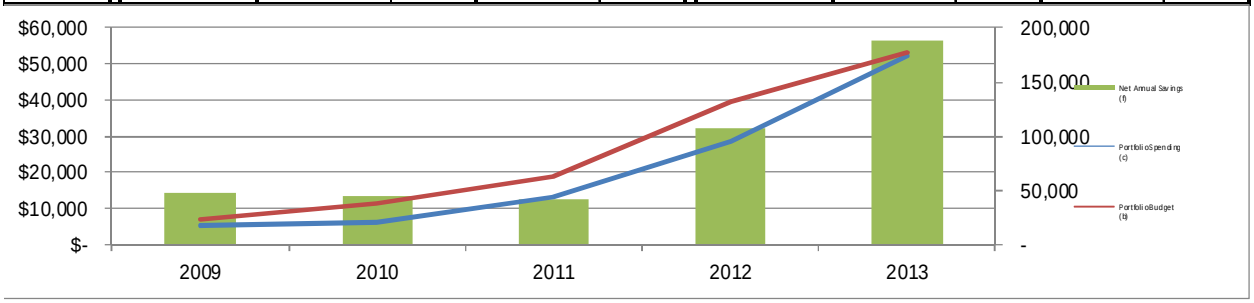


Table 1.5.4

Company Statistics

Company Statistics											
Program Year	Revenue and Expenses					Energy				
		Budget		Actual			Plan		Evaluated	
	Total Revenue (a) ($000's)	Portfolio Budget (b) ($000's)	% of Revenue (%=b/a)	Portfolio Spending (c) ($000's)	% of Revenue (%=b/a)	Total Annual Energy Sales (d) (MWh)	Net Annual Savings (e) (MWh)	% of Energy Sales (%=b/a)	Net Annual Savings (f) (MWh)	% of Energy Sales (%=b/a)
2009	$ 1,698,078	$ 7,231	0.4%	$ 5,269	0.3%	19,926,173	27,844	0.1%	48,042	0.2%
2010	$ 1,645,303	$ 11,431	0.7%	$ 6,373	0.4%	22,002,962	31,994	0.1%	44,251	0.2%
2011	$ 1,630,857	$ 18,685	1.1%	$ 13,414	0.8%	21,583,497	56,260	0.3%	41,958	0.2%
2012	$ 1,681,502	$ 39,609	2.4%	$ 28,515	1.7%	21,086,843	111,145	0.5%	107,627	0.5%
2013	$ 1,678,683	$ 53,032	3.2%	$ 52,285	3.1%	20,859,130	165,469	0.8%	188,468	0.9%



2.0 Portfolio Programs

2.1 Home Energy Solutions Program

2.1.1 Program Description:

The Home Energy Solutions ("HES") Program helps residential customers understand the benefits of energy efficiency and also implements energy efficiency improvements in their homes. Customers can call a toll-free number to reach an energy efficiency solutions representative, who directs the customer to the best energy efficiency solution based on the customer's need. Under the program, customers are provided guidance on low-cost, easily implemented home energy efficiency measures. Additionally, customers who are ready to take action by investing in energy efficiency improvements are offered in-home energy evaluations.

The program provides cash incentives to offset a portion of the costs of measures implemented within six months of being issued coupons. In addition, the program provides a list of participating contractors who promote installation of high efficiency equipment and services and can perform work in support of the program within the required timeframe.

Design elements of the HES Program include incentives to offset some to all of the cost of an energy evaluation provided by Home Energy Consultants ("HECs"). Two types of Home Energy Evaluations are available: a Tier 1 Survey, which includes a walk through, a recommendations report and direct installs, and a Tier 2 Assessment, which includes diagnostic testing of the structure and the duct system, a recommendation report and direct installs. Direct install measures (*e.g.*, CFL lighting) are offered at no charge to the customer.

Program incentives have been structured to promote the installation of multiple measures by customers, and bonus incentives have been added for:

- Installing air conditioners or heat pumps that have an air handler with an electronically-commutated motor
- Combining duct sealing with new air conditioner or heat pump installations
- Combining air sealing with ceiling insulation installations

- Achieving overall project savings in excess of 15% or 30%

For HECs, there is a bonus incentive if the customer installs two or more measures identified during a Tier 2 Assessment. Installation contractors receive a bonus incentive equal to 25% of the incentive coupon amount turned in for testing intensive measures (duct sealing, air sealing or wall insulation).

2.1.2 Program Highlights:

The HES Program achieved 245% of its gross annual energy savings goal of 5,013,750 kWh. The total energy savings achieved would power approximately 1,050 homes for one year.

The program has become more diverse and comprehensive regarding the types of measures being installed. In 2012, ceiling insulation continued to be the predominant measure in this program, but in 2013 duct sealing and air sealing participation exceeded the number of ceiling insulation installations. Customers that installed more than one measure increased from 9% in 2011 to 26% in 2012 and then to 87% in 2013. In 2012, testing-intensive measures such as duct sealing, air sealing, and wall insulation comprised 14% of projects, doubling 2011's 7% rate. In 2013, this increased to 73%.

While participation increased significantly, the program did not reach its participant objective. In 2013, the contractor network became more engaged in installing multiple measures thus resulting in more energy savings per home and using the customer incentives with fewer participants. In August 2013, EAI requested additional funding to expand the HES program to continue to encourage the growth of the contractor work and customer incentives in order to increase participation. The request was denied.[33]

Feedback on the program from customers and local participating contractors has been positive. As measured by the satisfaction survey during Quality Assurance verifications and the annual contractors satisfaction survey. In 2013, the independent evaluators also performed customer and contractor surveys. Both surveys demonstrate good satisfaction with this program.

[33] Docket No. 07-085-TF, Order No. 88 at 10.

Independent evaluation reports that:

- Nearly all 2013 HES participants were either very satisfied (73%) or somewhat satisfied (24%) with their program experience.
- Customers were much more likely to recommend the program to a friend, family member, or colleague in 2013 (97%) than in 2012 (84%).

Trade Allies were very satisfied with the HES Program. All of the interviewed Trade Allies expressed satisfaction with the program and reported that program participation increased their business volume. New, out-of-state Trade Allies said they would not have operated in Arkansas if the HES Program was not offered. These companies reported hiring and training local crews as a direct result of program demand. Additionally, Trade Allies noted it was beneficial to be able to offer the program to their customers.

- One local Trade Ally specifically reported that his customers have provided a lot of good feedback on the program and some have even "shared success of 30% to 50% energy savings" in their homes thanks to the program.
- An out-of-state contractor commented that the program "helped grow [his] business…" and that he "hired local crews."
- Another out-of-state contractor noted that his firm had "hired one [employee] locally and [he] plans to hire more."

The Trade Allies agreed that the program implementer provided satisfactory support. Specifically, Trade Allies mentioned that the implementation staff was quick to respond and resolve any project issues.

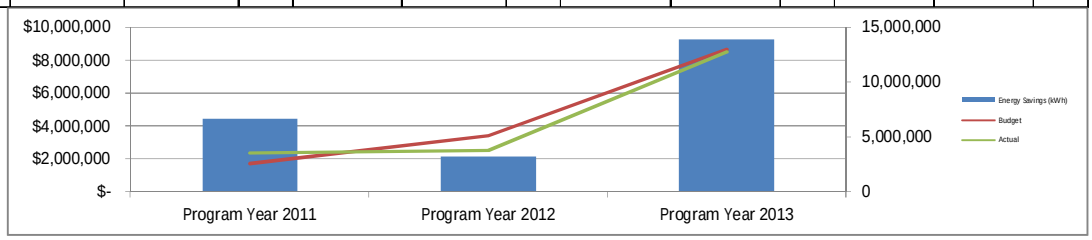
2.1.3 Program Budget, Savings & Participants:

Table 2.1.3 is the program budget, annual energy savings and participants from workbook table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.1.3

Home Energy Solutions Program Budget, Energy Savings & Participants

Home Energy Solutions												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 1,702,176	$ 2,363,899	139%	1,604,000	6,685,137	417%	900	3,477	386%	1,440	3,771	262%
Program Year 2012	$ 3,391,778	$ 2,527,754	75%	3,209,000	3,248,354	101%	1,800	1,475	82%	2,880	2,882	100%
Program Year 2013	**$ 8,659,482**	**$ 8,493,070**	**98%**	**4,011,000**	**13,935,561**	**347%**	**2,300**	**5,231**	**227%**	**3,600**	**6,431**	**179%**



Program Events & Training:

The HES Program provided a wide variety of training sessions to educate program contractors on program requirements, measure installation best practices, use of diagnostic equipment, measure installation techniques, and combustion safety testing, among others. In addition, the program requires BPI and RESNET certification. Many of the contractors received their certifications from Pulaski Technical College.

Program Savings:

The 2013 Home Energy Solutions Program gross annual energy savings goal was 5,013,750 kWh. The 2013 program saved 12,306,637 kWh and a gross amount of 12,306,637 kWh. After evaluation the program achieved a net savings of 13,935,566 kWh before line losses.

The 2013 Home Energy Solutions Program demand savings goal was 2,875 kW. The program achieved a gross demand savings of 4,414 kW for 2013, and after evaluation the demand savings was 5,230 kW before line losses.

2.1.4 Description of Participants

Participant: Anyone with a valid Entergy account number who lives in a single-family or multifamily unit of four units or fewer. The home must be a minimum of one year old and have a central heat and air conditioning (AC) unit. Participants (6,431) are counted on a per account basis.

2.1.5 Program Challenges & Opportunities:

The efficiency of qualified contractors has improved noticeably since 2012. The current 40 certified contractors installed 2.25 measures per customer in 2013 versus 48 contractors that installed 1.2 measures in 2012.

In late 2011, when the HES Program launched, the program adjusted the incentive levels for some measures in order to encourage more widespread adoption. Initially, incentives were not offered to contractors, but were added later to help offset the amount of time for proper program testing procedures. For the 2012 program year, incentives were added to partially offset a customer's cost of the energy evaluation, depending on their level of participation. Additionally in 2012, tiered bonuses were offered for the installation of two or more measures that would achieve 15% or 30% savings. These same incentives were offered through 2013. The additional incentives have made it possible for contractors that can efficiently install the measures to offer most program measures at little or no cost to the customer. This has resulted in higher participation levels.

The program will continue to recruit and train participating contractors as needed to meet future year energy saving goals.

Changes to the TRM that affected the HES Program were for the direct install measures; faucet aerators – negative impacts, and positive impacted measures included showerheads and advanced power strips. The overall net impact on savings was minimally positive. TRM changes required making changes and updates to program documents, marketing collateral,

coupons, calculators, processing tools and recorded savings in databases. TRM analysis and interpretation also required a significant amount of time.

EM&V Billing analysis completed for this annual report will result in program design changes if uncertainties mentioned in the introduction section of this report are proven accurate. The 61% RR adjustment for the ceiling and wall insulations measure would likely reduce program cost effectiveness, impact customer incentive levels or program design to include ceiling and wall insulation and likely result in Trade Ally/contractor concerns.

2.1.6 Planned or Proposed Changes to Program & Budget:

EAI applied for and received approval from the APSC for an expansion of the HES Program goals in 2014. This expansion will result in an increase of the program's expected energy savings to 17,765,179 kWh and the program's expected demand reduction to 6,807 kW This represents an increase of 345% over the original 2013 energy savings goal. However, with the recent development of the RR for ceiling and wall insulation, EAI does not believe these energy efficiency or demand reduction goals are achievable. At this time as due to reasons discussed earlier, EAI cannot predict outcomes of this expansion.

There were few changes made to the HES Program from 2012 to 2013 that will carry over into 2014 not discussed in previous reports. Those approved changes include:

1. Contractor Certifications: As of January 1, 2013, all participating contractors will be required to have at least a Building Performance Institute (BPI)-Building Analyst or Residential Energy Services Network (RESNET) Home Energy Rater certification. For insulation contractors that do not offer any other measures, two more certifications are acceptable alternatives: successful completion of the Air Sealing and Attic Preparation class offered by Pulaski Technical College or the Building Science Principles certification offered by BPI.
2. The energy efficiency measure changes are located in the schedule below:

Schedule 2.1.6

Energy Efficiency Measure Changes

Existing Measure			Removed from 2013 Program
Wall Insulation Direct Install (All Measures) Electronically-Commutated Motors Ceiling Insulation Duct Sealing Air Sealing HVAC (DX) HVAC (Heat Pump) (Air source and Ground source)			Commissioning of HVAC retrofit was removed due to the lack of any associated savings for the measure.

3. EAI will [or has] incorporate(d) Cadmus' process evaluation recommendations to program manuals, enhance data collection protocols and continue active outreach and training of contractors without requiring an increase in program funding.

4. EAI will consider program design modifications given the evaluator's billings analysis outcomes.

5. The 2013 HES tracking data contained several errors that required a laborious process to locate missing or incorrect values and prepare the data for analysis. Cadmus reported that update Tracking procedures to ensure that complete and accurate data are collected as necessary for program evaluations. EAI is committed to providing good data and, while work will continue in this effort, the retroactive TRM deemed savings adjustments must be completed within tight schedules, which increases costs and the likelihood of more errors.

2.2 CoolSaver℠ Program

2.2.1 Program Description:

The CoolSaver℠ Program increases energy efficiency by overcoming market barriers that prevent residential and commercial customers from receiving high performance A/C and heat pump system tune-ups. Energy savings are achieved by identifying A/C and heat pump system inefficiencies during the tune-up evaluation, and then correcting the inefficiencies.

The program overcomes market barriers by providing cash incentives to customers to motivate system corrections. The program also overcomes barriers by providing contractor incentives in the form of training on best practices, discounts on diagnostic tools, and incentives to conduct the high-performance system tune-ups.

CoolSaver℠ uses measurement and verification of Arkansas HVAC systems to determine savings rather than TRM deemed savings.

2.2.2 Program Highlights:

- The CoolSaver℠ AC Tune-up Program increased program participation dramatically in 2013. The program demand reduction goal was 1.8 MW and achieved 4.73 MW (gross) and 4.7 MW (net). The program had an energy savings goal of 4,150 MWh and achieved 10,629,095.8 MWh (gross) and 11,420,542.9 MWh as evaluated. The program provided incentives for 8,749 tune-ups in 2013, a 280% increase over the previous year. Program savings for 2013 alone exceeded the savings achieved in all previous years combined (since 2009).
- The program expanded geographic coverage of the contractor network in 2013, and more than tripled the number of participating contractors (from 30 to 105). Supply houses were recruited as Trade Allies to help spread the word to the contractor base and to host recruiting meetings to help contractors learn about the program.
- Project Summary Report were provided to contractors and commercial customers showing the cumulative savings of a multiple tune-up project. Final test-out status of individual AC's was also shown, which helps customers identify the systems most in need of replacement.

- The program operated as it did in the latter portion of 2012, using the "modeled" tune-up approach supported by the evaluator for the huge majority of the tune-ups conducted. The modeled tune-up program design complies with the IPMVP (International Performance Measurement and Verification Protocol). It means that the test-in step is not required to document the existing (pre) condition of the equipment because the savings are based on the historical record of achieved M&V savings which result from performing all incentivized measures during the tune-up. For participating units which could not be brought into compliance with the modeled requirements (some components could not be cleaned) due to prohibitive expense or physical impossibilities, the M&V approach was used. This means that pre and post efficiency and capacity was documented. There were 113 M&V tune-ups performed in 2013, and 8,636 modeled tune-ups. The incentive structure was modified from 2012 to the following in 2013:
    - $175 toward completion of a CoolSaver℠ tune-up on units 5 tons and smaller;
    - $200 toward completion of a CoolSaver℠ tune-up on units 6 tons and larger, up to and including 25 tons;
    - $300 toward replacement of an existing central AC or heat pump with an Energy Star®-Qualified unit of 15.0 SEER / 12.0 EER / 8.2 HSPF or greater for small business customers only; and
    - The $300 Commissioning incentive for the above replacements was discontinued, as well as the contractor Commissioning incentive, because they did not result in additional savings per measure.
- All program documents (including contractor manual, program manual, fact sheets, and other marketing collateral) were updated to reflect any and all program changes.

Independent evaluation reports that:

- Sector-specific (Residential and Commercial) Marketing materials were prepared and available to contractors at the start of the 2013 season. The Program's Implementation staff met individually with participating contractors to present new materials and determine which pieces contractors preferred to use. The Program assisted contractors' marketing efforts by providing preferred promotional pieces.
- Contractor training was substantially revised to incorporate more sales content and techniques. The Program's Implementation staff held face-to-face meetings with senior staff and marketing decision-makers within participating firms to help ensure successful business model transformation and marketing efforts.

- The Program worked diligently to cross-promote CoolSaver[SM] with other EAI programs and participants.
- CoolSaver[SM] achieved high satisfaction scores from participating customers. Over 96% of customers were either very satisfied or somewhat satisfied with both their tune-up and with the program overall.

2.2.3 Program Budget, Savings & Participants:

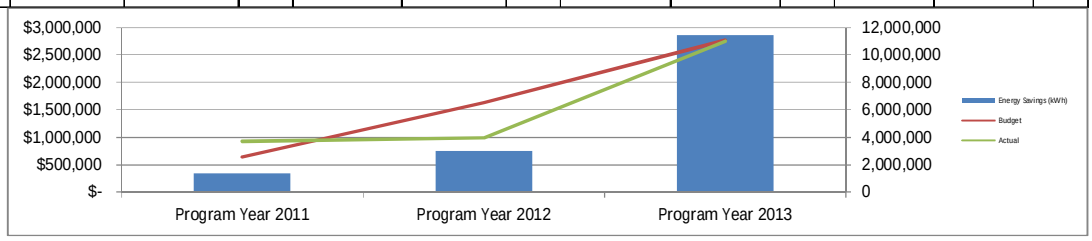
Table 2.2.3 is the program budget, annual energy savings and participants from workbook table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.2.3

CoolSaver[SM] Program Budget, Energy Savings & Participants

Efficient Cooling Solutions

	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	**Budget**	**Actual**	**%**	**Plan**	**Evaluated**	**%**	**Plan**	**Evaluated**	**%**	**Plan**	**Actual**	**%**
Program Year 2011	$ 646,336	$ 929,119	144%	1,383,000	1,400,520	101%	600	899	150%	3,354	3,007	90%
Program Year 2012	$ 1,641,215	$ 983,508	60%	2,767,000	3,042,245	110%	1,200	1,458	122%	6,707	3,101	46%
Program Year 2013	**$ 2,767,162**	**$ 2,758,468**	**100%**	**4,150,000**	**11,420,543**	**275%**	**1,800**	**4,673**	**260%**	**10,061**	**8,751**	**87%**



Program Events & Training:

The CoolSaver[SM] Program performed over 80 contractor training sessions on a variety of subjects, including program participation requirements, best practices in the performance of energy efficiency measures, and data collection techniques to fulfill the program's EM&V requirements. The Quality Technician training is a requirement for all program technicians; this training instructs the technician on performing a proper AC tune-up, proper use of the required toolkit, data entry and submission of completed tune-up activity in order to meet program standards.

Four of the Arkansas Two-Year Colleges which offer HVAC training have implemented CoolSaver^{SM} training into their programs by training their prospective technicians in the use of CoolSaver^{SM}-required tools and data collection procedures. These colleges are ASU-Searcy, National Parks Community College, North Arkansas College, and U of A Community College-Hope. In addition, these colleges have made their classroom and lab facilities available for training and mentoring events attended by local participating CoolSaver^{SM} contractors. The Trane dealer sales offices in Little Rock has also been supportive of the program by providing facilities for training events. Training events by month were:

Market Transformation Status

Variable	Contractors	Contractor Trainings
Jan	19	3
Feb	22	13
Mar	15	10
Apr	29	34
May	31	10
Jun	27	2
Jul	27	18
Aug	29	13
Sep	29	10
Oct	28	4
Nov	0	0
Dec	0	0

Program Savings:

- The 2013 annual energy savings goal was 4,150,000 kWh. The program saved 10,629,095.8 kWh (gross). The Net Savings were 11,420,542.9 kWh based on a net-to-gross ratio of 1.03.
- The 2013 demand savings goal was 1,800 kW. The program saved 4,730.095 kW (gross) and 4,672.667 kW (net).
- During the beginning of Program Year 2013, savings were calculated consistent with Cadmus' methodology used to calculate savings for the 2012 programs. During the latter portion of 2013, Cadmus recommended a new methodology based on the program history

of M&V-documented system improvements. After discussions and vetting with the Arkansas Independent Evaluation Monitor, this new methodology was applied to calculate the 2013 program savings. The program results are included in the program summary.

2.2.4 Description of Participants

A participant in CoolSaver^{SM} is defined as an individual air conditioner or heat pump system that is either (a) tuned-up to program requirements, or (b) replaced with a high-efficiency system meeting the program requirements for the replacement incentive.

2.2.5 Program Challenges & Opportunities:

- Starting the year using the modeled tune-up approach and modified incentive structure contributed significantly to the success of recruiting contractors as well as customers (due to the contractors' pricing of services). Supply houses were recruited as Trade Allies to assist in informing contractors across the state about the program. A concentrated contractor recruitment effort in Q1 and Q2 resulted in a significant increase in both contractors and Qualified Technicians. Both of these categories more than tripled the 2012 levels.
- In 2013, many more participating contractors refined their business models to create a CoolSaver^{SM} Department that dedicated more technicians to the program. This action is in large part due to increased marketing collateral, as well as increased outreach, sales and business training, and mentoring activities by program implementation staff.
- The program exceeded its original goals and incentive budget before the end of the tune-up season, and additional funds were identified by EAI to allow the program to continue to offer incentives until the end of acceptable weather for the completion of tune-ups.
- As in past years, contractors reported a shortage of technicians they can dedicate to performing program tune-ups. This continues to be a potential barrier to their consistent participation, especially during the hottest part of the season.
- Education of consumers to understand the difference between a common "market tune-up" or "maintenance agreement" and the additional savings and service provided through a

CoolSaver^{SM} Tune-up is a continuing challenge. The program will continue to rely on participating contractors to educate customers.

CoolSaver^{SM} is a sophisticated AC evaluation and improvement model, and was met with some initial resistance by the local market. However, the superior outcomes of this model, both in AC performance and customer satisfaction, is being successfully communicated to the market, resulting in increased participation in 2013. In certain geographic areas, there was enough local program activity to create a buzz among customers and non-participating contractors than in previous years, which helped to tip the market toward CoolSaver^{SM} participation for both sectors.

For both AC unit retrofits and replace-on-burnout units in this program, the demand reduction and energy savings are derived as described in the latest version of the TRM. The program does not include specific M&V for the retrofit applications. Rather, the replacement savings are claimed on burnout only and are not be based on existing equipment, performance, or age. Retrofits are recommended by field technicians when existing systems cannot be brought back to acceptable operating conditions based on CoolSaver^{SM} training.

This program will continue to maintain, identify and train HVAC technicians to the program's standards in order to grow the program as planned.

Retroactive adjustments have little impact on this program because it does not rely upon TRM modifications.

2.2.6 Planned or Proposed Changes to Program & Budget

Due to anticipated over-subscription, EAI filed to expand the program budgets for 2013 and 2014. Jeremy Champlin, EAI Project Manager, submitted testimony supporting and clarifying the need for the program expansion:

> EAI will increase the 2014 CoolSaver^{SM} Program budget by an additional $727,000. Table 6 below summarizes the budget, demand reduction and energy savings impact associated with the requested increase.

Table 6

CoolSaver^{SM} Program

Budget and Estimated Demand Reductions/Energy Savings with Expansion

	Demand Reduction MW	Energy Savings MWh	Program Budget
Current Budget	1.8	4,150	$ 2,406,000
Proposed Budget	3.9	9,100	$ 3,133,000
Requested Increase	2.1	4,950	$ 727,000

EAI's request for additional funds for the CoolSaver^{SM} Program stems, again, from the program's success in recruiting new participating contractors.[34] The Commission approved the 2014 budget increase and denied the 2013 budget increase.[35]

Evaluator recommendations for CoolSaver^{SM} included the following:

- Review the dual-circuit system incentive for the next program cycle.
- In the next program cycle, revise the participation targets to reflect actual savings per project and track participation by market segment.
- Collect additional qualitative data and perform M&V in 2014.

EAI plans to discuss each recommendation in more depth with the independent evaluator, determine the cost of recommended changes and benefit to the CoolSaver^{SM} Program, Trade Allies, and customers and make reasonable, cost-effective adjustments within program budget limitations.

[34] Champlin Supplemental Testimony at 3 (August 7, 2013).
[35] Docket No. 07-085-TF, Order No. 88 at 10.

2.3 Small Business Program

2.3.1 Program Description:

The Small Business Program is offered to commercial customers with less than 100 kW of peak demand. Certified participating contractors (Trade Allies) provide facility assessments and direct discounts to customers installing qualifying energy efficient equipment. These discounts are passed directly to the customer on the contractor invoice. Trade Allies are paid from the incentive budget after reporting and quality assurance/ quality control is completed.

The Small Business Program offers a mix of prescriptive measures, including lighting retrofits, lighting controls, exterior lighting, refrigeration, window film, and direct install measures.

2.3.2 Program Highlights:

Independent evaluation reports that although the program design remained unchanged in 2013, the program made several changes to support the program's progress. Implementation staff and utility staff reported several factors that contributed to the program's success in 2013:

- Hiring a Trade Ally coordinator, whose recruitment efforts led to the addition of 52 new Trade Allies;
- Hiring a program coordinator to manage the flow of administrative processes; and
- Increasing direct install efforts.

An expanded Trade Ally network and direct install efforts contributed significantly to the success of the program in 2013. This Trade Ally network consists of program trained and certified contractors that conduct energy efficiency assessments and complete energy efficiency projects through the program.

Thirty different Trade Allies in the network completed over 200 non-direct install projects in 2013. See Schedule 2.3.2.1 below.

Schedule 2.3.2.1

Trade Ally	Annual Savings (kWh)	Generated Incentives	Project Count
Trade Ally *	842,789.21	$157,489.26	24
Trade Ally 2	753,176.12	$132,588.12	46
Trade Ally 3	544,924.60	$114,878.03	8
Trade Ally 4	253,404.10	$ 49,408.01	5
Trade Ally 5	214,009.33	$ 39,859.13	34
Trade Ally 6	212,920.50	$ 37,908.60	11
Trade Ally 7	211,778.13	$ 43,304.42	11
Trade Ally 8	175,072.29	$ 57,478.42	21
Trade Ally 9	171,683.19	$ 36,053.47	4
Trade Ally 10	134,724.29	$ 25,518.61	4
Trade Ally 11	97,960.10	$ 19,559.57	9
Trade Ally 12	80,820.19	$ 16,972.24	1
Trade Ally 13	71,474.42	$ 13,712.24	5
Trade Ally 14	62,270.64	$ 13,076.83	1
Trade Ally 15	57,409.63	$ 12,056.02	1
Trade Ally 16	50,156.44	$ 10,532.85	2
Trade Ally 17	45,874.94	$ 9,633.73	2
Trade Ally 18	38,604.91	$ 8,107.03	3
Trade Ally 19	30,219.63	$ 4,565.01	2
Trade Ally 20	28,047.11	$ 5,889.89	1
Trade Ally 21	27,878.49	$ 4,371.11	2
Trade Ally 22	24,985.16	$ 5,246.89	2
Trade Ally 23	20,718.09	$ 4,350.81	2
Trade Ally 24	19,896.43	$ 4,106.25	1
Trade Ally 25	18,353.36	$ 3,854.21	1
Trade Ally 26	16,523.94	$ 2,256.91	1
Trade Ally 27	15,621.45	$ 2,980.66	6
Trade Ally 28	13,946.93	$ 2,781.00	1
Trade Ally 29	12,631.00	$ 2,652.51	1
Trade Ally 30	7,498.48	$ 774.00	1
TOTALS	**4,255,373.08**	**$841,965.80**	**213**

This table represents gross kWh energy savings for non-direct install projects

EAI is continuing efforts to expand current measures, identify new measures, and increase Trade Ally participation under the newly expanded program in 2014. Other 2013 highlights include:

- The Small Business Program achieved 7,506,086. kWh in energy savings, which is 332% of the 2013 kWh gross savings goal, leading to a program expansion in 2014. The program's overall NTG savings was 103%.

- Direct installation of low-flow faucet aerators, pre-rinse spray valves, vending misers, and the addition of compact fluorescent lamps (CFLs) provided more opportunities to increase offerings and reach more businesses through lighting assessment leads for Trade Allies.
- Efforts to increase refrigeration efficiencies have been successful by including Electronically Commutated Motor (ECM) retrofits and Anti-Sweat Heater Controls;
- Coordinating EAI and natural gas utilities proved important for providing mutual and holistic benefits to program participants. The Small Business Program had 85 collaborative projects in 2013.

Independent evaluation reports:

- Program participation helped trade allies increase sales and improve customer satisfaction;
- Trade Allies reported that program participation helped them realize a variety of benefits, including:
  - "Open doors with customers and provide an added value";
  - Shorten the payback and increase the return-on-investment (ROI) on lighting projects;
  - "Expand our market in Arkansas";
  - "Provide a more cost-effective way for customers to participate and save energy."

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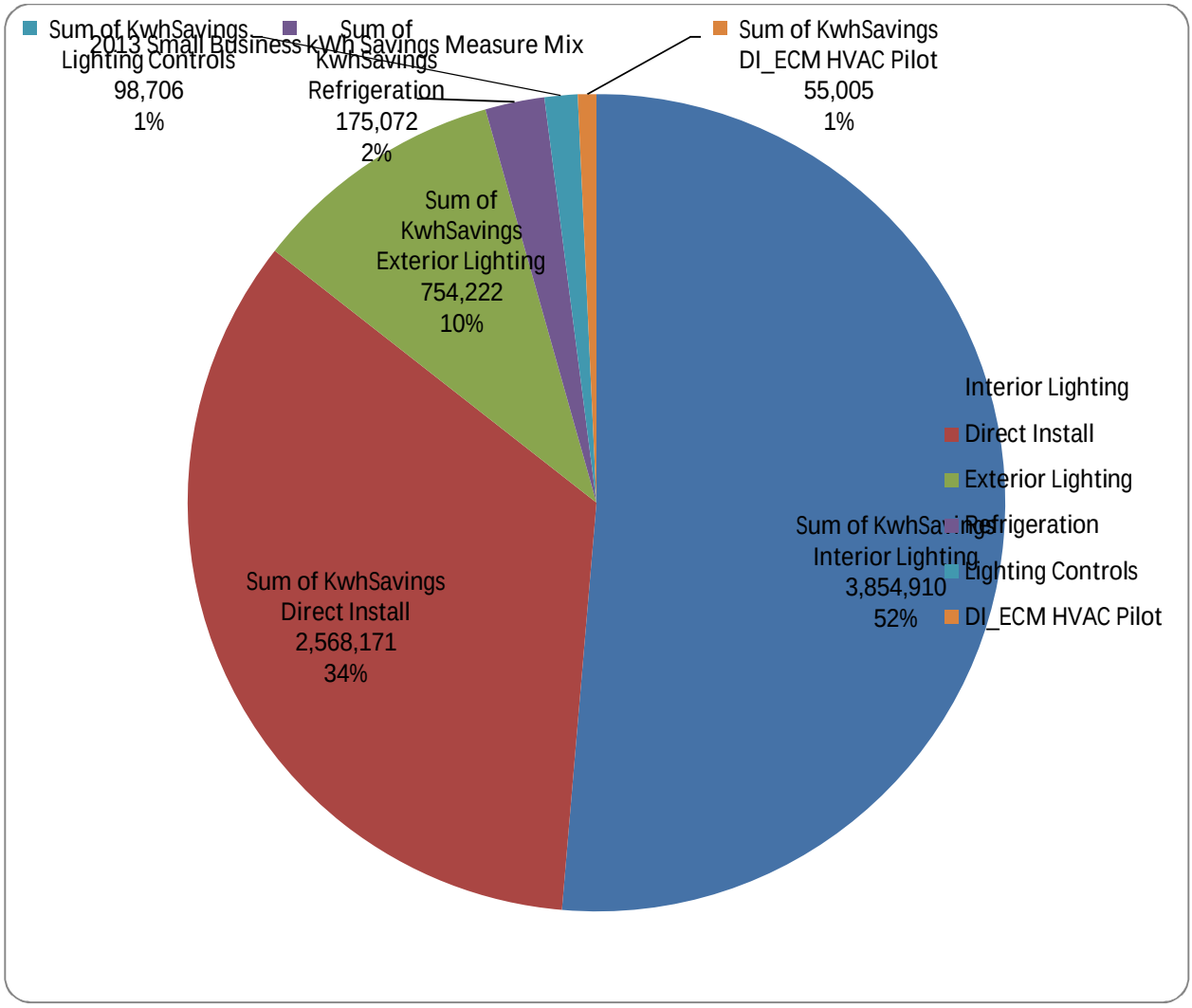
Schedule 2.3.2.2

Number of Retrofit, as Opposed to Replace-on-Burnout Projects

	Interior Lighting	Interior Lighting Controls	Exterior Lighting	Refrigeration	Direct Install Aerators	Direct Install CFL	Direct Install PRSV	Direct Install VM	Direct Install ECM
Retrofit	191	2	79	19	572	82	33	113	9
R.O.B.	-	-	-	-	-	-	-	-	-
N.C.	-	-	-	-	-	-	-	-	-



This chart represents the gross annual kWh energy savings measure mix

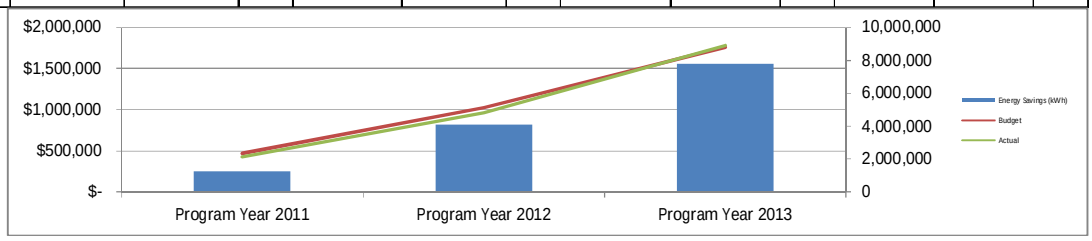
2.3.3 Program Budget, Savings & Participants:

Table 2.3.3 shows the program budget, annual energy savings, and number of participants from workbook Table 5, as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.3.3

Small Business Program Budget, Energy Savings & Participants

Small Business												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 466,920	$ 427,534	92%	603,000	1,259,460	209%	200	328	164%	442	51	12%
Program Year 2012	$ 1,030,625	$ 965,850	94%	1,207,000	4,089,338	339%	400	871	218%	883	449	51%
Program Year 2013	**$ 1,760,575**	**$ 1,784,952**	**101%**	**1,810,000**	**7,787,545**	**430%**	**600**	**1,488**	**248%**	**1,325**	**857**	**65%**



Program Events & Training:

The Small Business Program conducted 112 recruitment and training events in the 2013 Program Year. The training events included instructions on program participation, Trade Ally enrollment for training on field inspections, and program best practices/processes. See the Annual Report Workbook for training details.

Providing adequate and effective training is essential to the success of the Trade Allies in the Small Business Program. In addition, it is important to provide Trade Allies with proper ongoing support and efficient processing of incentives. The "Entergy Energy-Efficiency Portfolio Evaluation Report 2013 Program Year by CADMUS validated some of the Trade Allies experiences in the Small Business Program as it pertains to program training and process:

> *Trade Allies noted that simple program paperwork, incentive processing, and incentive levels enabled them to move forward quickly once customers expressed interest in pursuing a project. The following Trade Ally verbatim responses indicate aspects of the program that worked well for them:*

- *The training was great.*
- *The [application] system in place is a good one.*
- *CLEAResult processes data in a timely manner so that the customer sees the incentive estimate. It helps them move forward quickly.*
- *It gives us an opportunity to have a warm introduction to customers because customers are more receptive to the program offer than a cold call.*
- *The rebate amounts are very good.*

Program Savings:

The 2013 gross annual energy savings goal for the Small Business Program was 2,262,500 kWh. The program achieved an annual gross energy savings of 7,506,086 kWh, which is 332% of the gross goal; after evaluation the program savings reflected a net amount of 7,787,545 kWh.

The 2013 gross annual demand savings target for the Small Business Program was 750 kW. The program achieved a gross annual demand savings of 1,562 kW, which is 208% of the gross target; after evaluation the program achieved a net demand savings amount of 1,488 kW.

2.3.4 Description of Participants

A program participant is defined as any EAI commercial customer with less than 100 kW of peak demand that receives electric service from EAI. Participants are counted by tax ID number, and each participant can include multiple account numbers, projects, and measures.

2.3.5 Program Challenges & Opportunities:

Trade Ally participation and engagement is vital to the continued success of the Small Business Program. There has been some success in identifying and recruiting qualified Trade Allies in certain regions of the state. However, efforts are ongoing to provide the appropriate level of Trade Ally engagement and coverage across the state. The program is actively recruiting and training additional Trade Allies from various other regions in the state. The program expansion for 2014 has increased savings targets that will provide an opportunity to grow the program team. A full-time program specialist was brought on to address this challenge for achieving the increased savings.

With incentive levels remaining the same, the challenge is to provide more measure offerings to the small business market sector while being cost effective and comprehensive. The development of more measures will be important to continued success in 2014. This challenge will be met through focusing of staff resources to provide more development for new measures.

Direct installation has again proven to be a great success in the Small Business Program for 2013. The program was able to add CFLs to the direct install offerings and efforts are continued through direct outreach to provide these services.

Retroactive EM&V & TRM Impacts Discussion

Retroactive TRM adjustments to the Small Business Program created substantial challenges. The retroactive adjustments required shifting program staff from current job duties and functions to modifying all affected historical calculations for the measures in this program instead of supporting or developing participant projects negatively impacted program production In addition, the retroactive adjustments resulted in additional personnel costs to support both efforts during the busiest time of the program year and in negative impacts on attaining goal near the end of the year at a time that allowed little opportunity for additional program outreach.

2.3.6 Planned or Proposed Changes to Program & Budget:

In 2014, the program will be operating under a program expansion approved by Commission in 2013[36]. This expansion will increase the savings goal and the incentive budget. The new savings goal is 9,997,895 kWh, and the incentive budget is $1,549,450.00. The incentive levels will remain the same because the program has been successful in implementing savings goals and working within the incentive budgets.

[36] Order No. 88 at 10.

Schedule 2.3.6

Energy Efficiency Measures Changes

Existing Measure	Added to 2014 Program	Removed from 2014 Program
Interior Lighting (Retrofit)	N/A	N/A
Interior Lighting (Controls)		
Exterior Lighting (Retrofit)		
Window Film		
Direct Install (Aerators, PRSVs, Vending Misers, CFLs)		
Refrigeration		
Kitchen Upgrades		
Ceiling Insulation (Converted Residences)		
Duct Sealing (Converted Residences)		

The independent evaluator reported the 2013 Small Business tracking data contained several errors that required a laborious process to locate missing or incorrect values and prepare the data for analysis. The evaluator's recommendations are to update tracking procedures to ensure that complete and accurate data are collected as necessary for program evaluations. EAI is committed to providing good data and will continue to make process improvements. However, the retroactive TRM deemed savings adjustments must be completed under a very tight schedules that introduces the risk of higher costs and more errors.

2.4 CitySmart[SM] Program

2.4.1 Program Description:

The CitySmart[SM] Program provides technical assistance, energy planning recommendations, and financial incentives to local public entities (cities, counties and public/private schools/colleges) for the installation of energy efficiency measures that save energy. The program helps local public/private entities operate their buildings more efficiently by explaining the technical and financial benefits of investing in energy efficiency, developing a plan to make energy efficiency improvements, and providing support in completing projects.

After upgrades are completed and verified, the program provides cash incentives for projects that save energy. The projects submitted under the CitySmart[SM] Program can be single measure projects through a Trade Ally or comprehensive projects, including multiple complex measures requiring M&V.

The program provides technical assistance, manages program incentive funds, verifies that the savings claimed through the program are accurate and appropriate, and uses appropriate M&V methods to prove savings (where necessary). , Energy Benchmarking and Energy Master Planning are provided for participants specified within the program.

2.4.2 Program Highlights:

- The CitySmart[SM] Program achieved 16,835,419.46 kWh in energy savings, which is 130% of the 2013 gross kWh savings goal, and an overall NTG of 94.37%;
- Eighty-nine buildings were benchmarked using EPA's Portfolio Manager Tool;
- The program conducted four Energy Master Planning Workshops;
- Waste Water Treatment Plant assessments were conducted at four different locations; and
- PC power management was tested as a pilot measure in 2012, and one project was completed as M&V. In 2013, PC power management was included in the TRM 3.0 update as a prescriptive measure and achieved over 9 million kWh in energy savings.

Independent Evaluator reports:

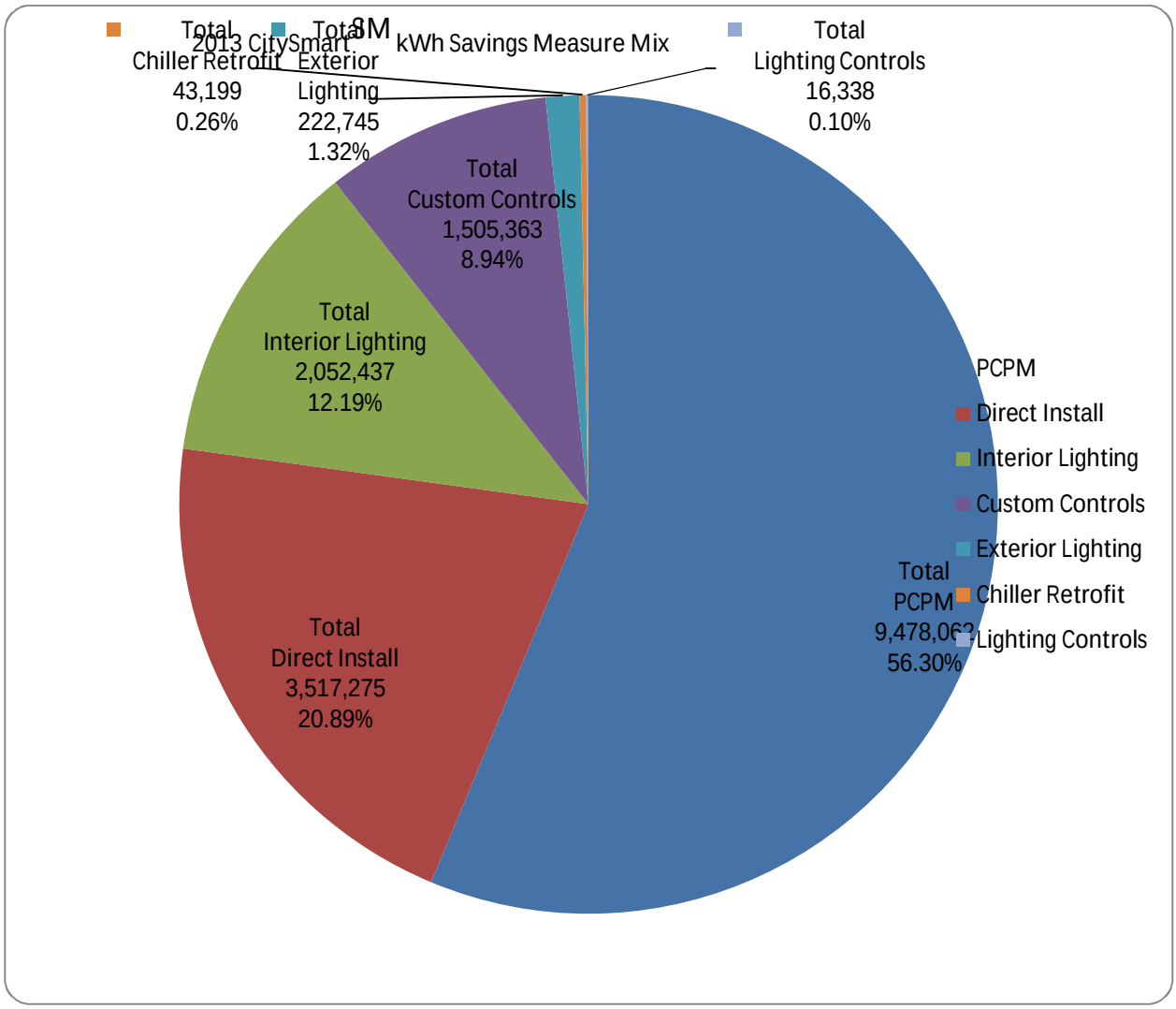
- Projects represent a wider range of installed measures in 2013 compared to 2012. In 2012, lighting represented approximately 66% of CitySmart^{SM} Program savings. One evaluation recommendation was that program and implementation staff diversify the program measure mix and encourage more comprehensive projects.
- Program and implementation staff reported that customers expressed more interest in non-lighting measures in 2013 than they had in 2012. The staff attributes some of this increased interest to the Arkansas TRM's addition of PC power management, which means the program staff can provide incentives for this tool. In 2013, EAI offered a generous incentive that allowed customers to install the measure with almost no capital outlay and, because many school and government buildings have a large number of computers at each facility, PC power management was the most installed measure in 2013.
- Program and implementation staff also encouraged past participants to pursue additional measures. Program staff stated, "If you've got a good customer there's always more that can be done." Staff encouraged past customers to consider an energy master planning session or to conduct benchmarking to identify additional energy-saving opportunities. As a result, many prior customers participated in the program again in 2013 to install measures in addition to lighting and direct installation measures.

- EAI coordinated its program implementation with natural gas utilities to provide mutual benefits to program participants. The CitySmart^{SM} Program had 39 collaborative projects in 2013.

Schedule 2.4.2

Number of Retrofit, as Opposed to Replace-on-Burnout Projects

	Interior Lighting	Interior Lighting Controls	Exterior Lighting	Chillers	PC Power Mgmt.	Direct Install Aerators	Direct Install VM	Direct Install CFL	Direct Install PRSV
Retrofit	26	1	8	3	16	289	194	8	3
R.O.B.	-	-	-	-	-	-	-	-	-
N.C.	-	-	-	-	-	-	-	-	-



This chart represents the gross annual kWh energy savings measure mix

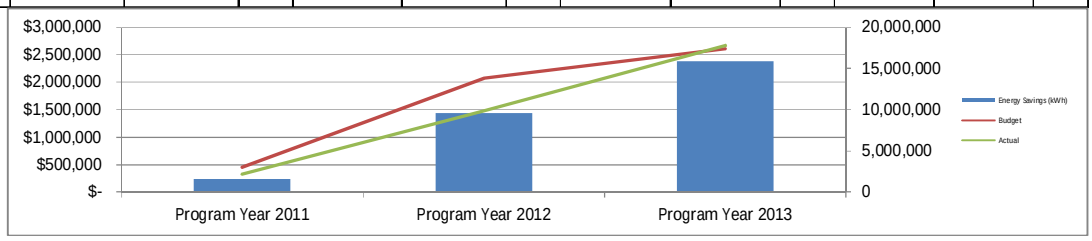
2.4.3 Program Budget, Savings & Participants:

Table 2.4.3 is the program budget, annual energy savings and number of participants from workbook table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.4.3

CitySmart[SM] Program Budget, Energy Savings & Participants

City Smart												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 453,225	$ 327,117	72%	1,725,000	1,568,473	91%	200	377	189%	27	12	44%
Program Year 2012	$ 2,082,153	$ 1,471,138	71%	6,901,000	9,611,846	139%	900	1,644	183%	106	524	494%
Program Year 2013	**$ 2,611,588**	**$ 2,675,130**	**102%**	**10,352,000**	**15,888,237**	**153%**	**1,400**	**1,611**	**115%**	**159**	**717**	**451%**



Program Events & Training:

In 2013, the CitySmart[SM] Program conducted Energy Master Planning Workshops for four customers and benchmarked 89 buildings. Energy Master Planning Workshops addressed energy management issues and obstacles and questions common to schools, cities and counties. In addition, these workshops presented energy performance benchmarking analysis to assist public entities in benchmarking their facility performance against other similar facilities.

Program staff also conducted 14 different presentations across various locations (for example, Rotary/Kiwanis Clubs and chamber of commerce meetings). Program presentations were made and information booths were set up at several key events (for example, the Arkansas Municipal League Annual Conference, University of Arkansas Sustainability Summit, and planning district meetings).

See more training details in the Annual Workbook Report.

Program Savings:

- The 2013 gross annual energy savings goal for the CitySmart^{SM} Program was 12,940,000 kWh. The program achieved an annual gross energy savings of 16,835,419 kWh, representing 130% of the gross kWh goal; after evaluation the program savings were netted to 15,888,236 kWh.
- The 2013 gross annual demand savings target for the CitySmart^{SM} Program was 1,750 kW. The program achieved a gross annual demand savings of 1,761 kW, equal to 101% of the gross target; after evaluation the program reflected a net demand savings of 1,610 kW.

2.4.4 Description of Participants

A participant is defined as any EAI customer that is a local public and/or private entity customer (for example, k-12 schools, higher education institutions, and municipalities) that receives retail electric service from EAI. Participants are counted by tax ID number, and each participant can include multiple account numbers, projects, and measures.

2.4.5 Program Challenges & Opportunities:

The Program Year 2013 offered many opportunities and challenges. Customers in this market segment were challenged by the economic climate, and found it difficult to fund projects. EAI worked with customers to identify short-term solutions, such as PC power management and lighting solutions, and long-term solutions, including HVAC controls and waste water treatment plant upgrades, in order to gain rapid returns and savings that will continue. The Company also educated customers on other financial options, such as:

- Lease Agreements that offered low-rate (often tax exempt) funding which allows financing of capital equipment over longer periods of time (10+ years) by utilizing "operating cost" dollars;
- Bond Issues through a taxpayer (public) approved mechanism that funds capital improvements over time at low rates (approvals can take substantial time); and
- Performance Contracting through a: guaranteed or shared savings agreement with a performance contractor that funds capital improvements over a period of time using energy and/or operational savings.

Developing more custom energy efficiency projects for this program is important to continued success in 2014. Plans are currently underway to identify additional custom energy efficiency projects for 2014 and beyond. Program staff is encouraging existing Trade Allies that offer M&V solutions, and recruiting new Trade Allies, to recruit more customers to implement M&V opportunities.

Retroactive EM&V & TRM Adjustment Impacts

Retroactive TRM adjustments to the CitySmart^{SM} Program created substantial challenges. The retroactive adjustments required EAI to pull program staff from their current jobs and functions to modify all affected historical calculations for the measures in this program, instead of supporting or developing participant projects, which negatively impacted program production. The retroactive adjustments caused EAI to incur additional personnel costs to support both efforts during the busiest time of the program year and had some impact on planning for goal attainment near the end of the year. The retroactive adjustments occurred late in the program year which allowed little opportunity for additional program outreach.

2.4.6 Planned or Proposed Changes to Program & Budget:

In 2014, the CitySmart^{SM} Program will continue to operate under the same structure and budget. PC power management will continue to be offered as a measure and has been approved and accepted in TRM 3.0 as a prescriptive measure.

Schedule 2.4.6

Energy Efficiency Measures Changes

Existing Measure	Added to 2014 Program	Removed from 2014 Program
Interior Lighting (Retrofit) Interior Lighting (Controls) Exterior Lighting (Retrofit) Window Film Direct Install (Aerators, PRSVs, Vending Misers, CFLs) Refrigeration Kitchen Upgrades HVAC Controls New Construction (Lighting & HVAC) VFDs (Retrofit) HVAC (Retrofit) Chiller (Retrofit) PC Power Management WWTP Pump (Retrofit) WWTP Fans/Blower (Retrofit)	N/A	N/A

The independent evaluator recommended EAI develop ways to enhance and reward Trade Ally marketing efforts given public procurement processes. EAI will discuss this recommendation in more depth with the independent evaluator to determine the cost of implementing the recommended changes and the potential benefit to the CitySmart^{SM} Program, Trade Allies and customers. EAI will make reasonable, cost-effective adjustments within program budget limitations.

2.5 Commercial and Industrial Custom Program

2.5.1 Program Description

The 2013 Commercial & Industrial (C&I) Custom Program provided technical assistance and financial incentives for large, complex, and/or comprehensive energy efficiency measures to the target customers. This program allowed commercial and industrial customers to maximize the energy efficiency of their facilities by upgrading energy consuming equipment and improving energy management practices.

There is no defined calculation methodology for custom measures in this program; therefore, standard Measurement and Verification methodologies are used to quantify savings. Prescriptive measures can also be included as a part of the projects in this program, and these measures do not require M&V. As in the Prescriptive Program, the prescriptive measures use savings calculation methodologies as outlined in the current version of the TRM. In addition to financial incentives, the program offers technical assistance to participants and Trade Allies in the form of facility assessments, information on viable technologies, savings estimates, support in evaluating financial metrics, assistance in completing program documentation, and measurement and verification of savings for custom measures completed in the program.

The changes made in incentive rates for the 2013 C&I Prescriptive Program carry forward to the 2014 C&I Custom Program.[37] Projects submitted to this program must include at least one custom measure and must pass a cost-effectiveness test, which is a TRC test performed by EAI staff. Changes to the Prescriptive Program, as outlined in that section of this Annual Report, carried forward for Prescriptive Program measures captured as a part of a Custom Program project in 2013.

The C&I Custom Program relies on direct outreach for market penetration, including relying on Trade Allies to represent the program to their customers. Trade Allies are contractors or distributors in the state who are educated about the program and use the technical assistance and incentives to enhance their business offerings. The Trade Ally coordinator position on the program implementation team was adjusted in 2013 to provide more regular outreach, communication, and training for Trade Allies.

[37] Approved in Docket 13-002-U, Order No. 88.

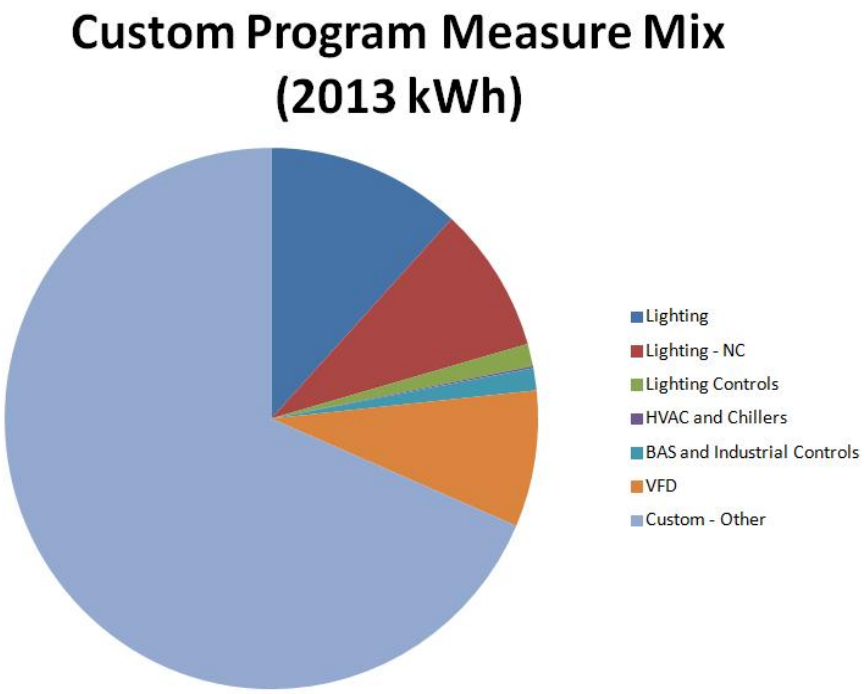
In addition to Trade Allies, additional program staff members were put in place on the implementation team to achieve better market outreach. Dedicated account managers were put in place early in the 2013 program year to provide outreach and education for program participants. These outreach efforts are in addition to the market penetration methods which continued from the 2012 programs, which include placement of program data on the EAI website, Trade Ally outreach, presentations at public/professional organizations, outreach with EAI customer service staff, and direct outreach via program staff.

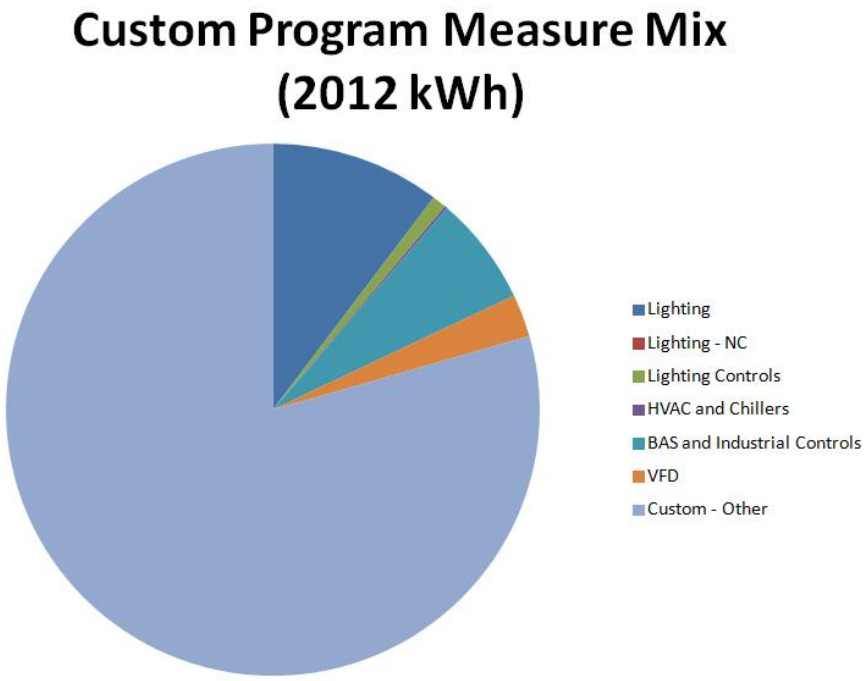
Feasibility study co-funding was offered for C&I customers in the 2013 program year. This co-funding allowed some costs of energy efficiency studies to be offset by program incentives, making studies for more complex projects affordable. These studies were targeted to develop comprehensive solutions, identifying projects that might not otherwise because the initial cost to investigate and quantify the energy savings potential was a barrier to customer participation.

2.5.2 Program Highlights

- The 2013 C& I Custom Program achieved 218% of the program energy savings goal and 154% of the program demand savings goal (based on gross reported savings).
- The 2013 C&I Custom program savings results showed an increase of 160% in energy savings and 172% in demand savings over the 2012 program year results.
- Coordination of EE programs between EAI and gas utility programs provided benefits to program participants. The C&I Custom Program had 6 collaborative projects in 2013.
- Market Transformation metrics:
    - Trade Allies are not aligned with a single C&I Program, but the C& I Program suite now has 142 Trade Allies participating, an increase of 122% over 2012.
    - The C&I Prescriptive and Custom Programs provided 11,742 outreach efforts to potential participants by phone calls and program events or by providing program information, which is an increase of 93% over 2012. Five hundred forty-five participants in the program completed projects and received incentives, which is an increase of 244% from the 2012 Program Year.
    - The measure mix in 2013 showed that custom measures still are responsible for more than 60% of the total program energy savings, but there was a growth in other

measures over the savings reported in 2012. A comparison of the gross energy savings (kWh) measure mix for 2012 and 2013 follows.





The 2013 C&I Custom Program continues to drive successful complex and comprehensive projects. The incentive structure allows for tiered incentives and assists customers in completing energy efficiency projects that might not have happened without the increased incentives. The feasibility study co-funding continues to be an avenue that Trade Allies use to evaluate facilities and develop complex projects and, as in 2012, these consisted mostly of compressed air projects.

An analysis of the projects captured in 2013 showed that the custom incentives offset approximately 65% of the incurred cost (by measure) and offset 64% of the total program measure costs for installed projects in the program.

EAI and CADMUS implemented a proactive process to review custom M&V plans which helped CADMUS to engage in EM&V in more real time, to obtain M&V planning in more real time, and to provide advice and acknowledgement that the M&V plan was appropriate. This new process also enabled EAI to better manage EM&V uncertainties, retroactive adjustments, and cost effectiveness of projects and program.

The independent evaluator reported:

- The C&I Custom Program benefitted from changes made to the C&I Prescriptive Program;
- Projects represent a wider range of installed measures in 2013; and
- Customers continue to face a variety of challenges when pursuing energy-efficiency upgrades.

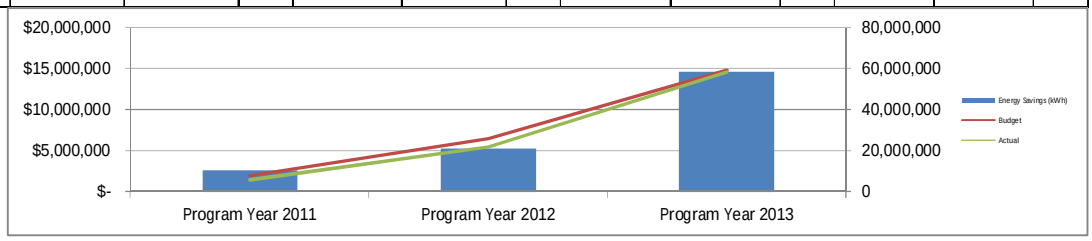
2.5.3 Program Budget, Savings & Participants:

Table 2.5.3 presents the program budget, annual energy savings, and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.5.3

C&I Custom Solutions Program Budget, Savings & Participants

C&I Custom Solutions												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 2,001,082	$ 1,427,566	71%	5,176,000	10,275,701	199%	900	2,348	261%	66	21	32%
Program Year 2012	$ 6,448,725	$ 5,403,317	84%	15,528,000	20,830,917	134%	2,600	2,422	93%	199	31	16%
Program Year 2013	**$ 14,732,537**	**$ 14,525,835**	**99%**	**31,056,000**	**58,279,669**	**188%**	**5,200**	**6,489**	**125%**	**398**	**107**	**27%**



Program Savings

- The 2013 annual energy savings goal for the C&I Custom Program was 31,056,000 kWh. The program achieved gross annual energy savings of 67,565,380 kWh (after TRM 3.0 updates). The net energy savings for this program after evaluation was 58,279,668 kWh, based on an overall NTG of 86.26%.
- The 2013 demand savings goal for the C&I Custom Program was 5,200 kW. The program achieved gross annual demand savings of 7,994 kW (after TRM 3.0 updates). The net demand savings for this program after evaluation was 6,489 kW, based on an overall NTG of 81.17%.

2.5.4 Description of Participants

A participant is defined as any non-residential EAI customer that has enrolled in the energy efficiency programs who will exert best efforts to approve, fund, and install projects during the Program year. Participants who perform projects that include only prescriptive measures are not eligible for the Custom Program. Participants are counted by tax ID number, and each participant can include multiple account numbers, projects, and measures.

2.5.5 Program Challenges & Opportunities

As with the 2012 programs, the economic climate continues to present challenges where facilities cannot afford to fund, have limited funding availability, or have more stringent capital investment criteria to justify funding for projects. Also, similar to the 2012 Program Year, the C&I sector tends to hold funding until the end of the fiscal year, creating a substantial increase in program participation in the last quarter of the program year.

Reorganization of the EAI customer service group during the latter part of 2013 is resulting in program outreach issues. These EAI personnel were pivotal in leveraging relationships to drive program interaction with managed accounts. EAI is in the process of developing the plan to minimize the reorganization impacts and determine how the programs will interact with the revised customer service team.

The Customer SD Option continues to present challenges for program success as more large customers choose to opt out of the program. Program staff are now communicating the self-direct status of EAI account holders to Trade Allies when asked, along with making each customer aware of the SD option prior to receiving program incentives. This approach has reduced the number of customer service issues that result from incentive discussions with opt-out accounts.

The latest data from EAI staff shows the total energy usage of the customer base declined by 12% due to the self-direct option, but the Commercial and Industrial energy base eliminated from the EAI programs due to SD certification has increased to 19%. Program staff members continue to work with EAI to promote the Commercial and Industrial programs, while attempting to make the customers aware of the SD option and its limitations if a customer wants to participate in the EAI programs.

In spite of the challenges to this program, the success rate of projects that closed after receiving program assistance has increased from 35% in 2012 to approximately 50% in 2013. Given that the primary change to the program was the addition of dedicated outreach staff to the implementation team, this indicates that the added outreach efforts have had a positive impact on program participation.

Managing the cost effectiveness of the C&I Custom Program was challenging in 2012 due to the retroactive EM&V adjustments and continued to be problematic in 2013, despite efforts to engage EM&V contractors early in the customer project process.

2.5.6 Program Planned or Proposed Changes to Program & Budget

The Large C&I Custom Program will be merged with the C&I Prescriptive program in 2014.[38] This will allow a more consistent approach to the large C&I sector and will add tiered incentives for projects that include only Prescriptive Program measures. The tiered incentives should increase participation where customers can leverage higher incentive rates and complete more comprehensive projects where only Prescriptive Program measures are installed. Another expected benefit of the consolidation is that it will simplify the program messaging to the marketplace and reduce confusion for participants and Trade Allies.

Feasibility studies will continue to be offered in the Large C&I Program and may include prescriptive only projects under special circumstances, but are primarily intended for complex, engineered studies as would have been encountered in the Custom Program. The incentive compensation for feasibility studies has increased to cover 50% of the study cost at the time of submission and the other 50% when the project closes, provided the project is estimated to achieve over 250,000 kWh. This incentive increase is intended to cover all of the feasibility study costs, up during the 2013 Program Year. This change is in response to a recommendation from the independent evaluator in the 2012 Annual Report to increase feasibility study co-funding due to limited participant interest. It is expected that this change will make the feasibility study co-funding more attractive to participants and energy professionals who offer these services and will create a more diverse interest in the co-funding.

The total incentive budget for the combined Large C&I Program will increase (as explained in the filing to the APSC) to accommodate the expected growth of incentives. This growth in incentive expenditure is expected to come from projects using prescriptive tiered incentives, as well as the increased prescriptive incentive rates carrying forward from 2013.

[38] Commission approved in Docket No. 13-002-U, Order No. 88.

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Retroactive EM&V adjustments to the C&I Custom Program caused some challenges, mainly because M&V for custom projects is difficult to apply. Some custom projects experienced significant negative adjustments due to EM&V, and EAI plans to make the benefit-cost criteria more stringent to manage cost effectiveness of the program.

The independent evaluator recommended the following changes:

- Adjust the qualifications for compressed air leak repairs;
- Provide more QC to ensure effective commissioning and system operation;
- Conduct metering for two weeks;
- Use M&V data appropriately;
- Develop ways to enhance and reward trade ally marketing efforts;
- Set appropriate measure lives by adopting a measure life of 8 to 10 years for operations and maintenance projects that only repair or refurbish existing equipment;
- Conduct a persistence study on industrial operation and maintenance measures; and
- Investigate more effective air flow estimates.

EAI will discuss these recommendations in more depth with the independent evaluator to determine the cost of recommended changes and benefit to the Custom Program, Trade Allies and customers. EAI will make reasonable, cost effective adjustments within program budget limitations.

2.6 Commercial and Industrial Prescriptive Program

2.6.1 Program Description

The 2013 Commercial & Industrial (C&I) Prescriptive Program provides technical assistance and financial incentives for common energy efficiency measures that are commercially available in the marketplace and that produce energy savings which can be determine with TRM Deemed Savings. The measures in this program utilize pre-defined calculation methodologies as outlined in the current version of the TRM and do not require measurement or verification for the calculation of savings or project incentives. In addition to financial incentives, the program offers technical assistance to participants and Trade Allies in the form of facility assessments, information on viable technologies, savings estimates, support in evaluating financial metrics, and assistance in completing program documentation. In 2014 this program will be combined with the C&I Custom Program as approved by the Commission.[39]

The C&I Prescriptive Program relies on direct outreach for market penetration, including relying on Trade Allies to represent the program to their customers. Trade Allies are contractors or distributors in the state who are educated about the program and who use the program's technical assistance and incentives to enhance their business offerings.

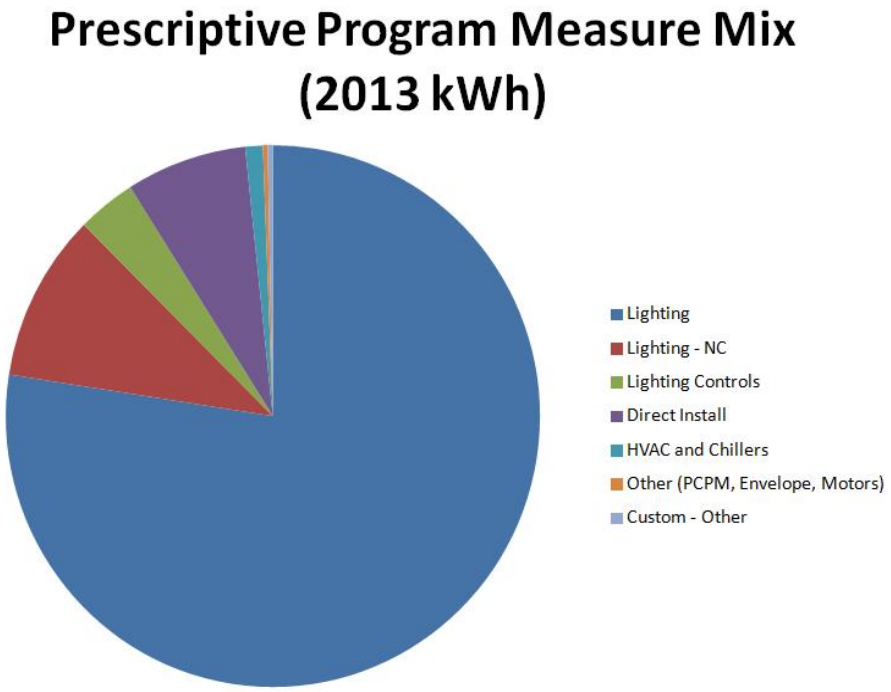
In addition to Trade Allies, additional program staff members were put in place on the implementation team to achieve better market outreach. Dedicated account managers were put in place early in the 2013 Program Year to provide outreach and education for program participants. These outreach efforts are in addition to the market penetration methods which continued from the 2012 programs. These outreach efforts still include placement of program data on the EAI website, Trade Ally outreach, presentations at public/professional organizations, outreach with EAI customer service staff, and direct outreach via program staff.

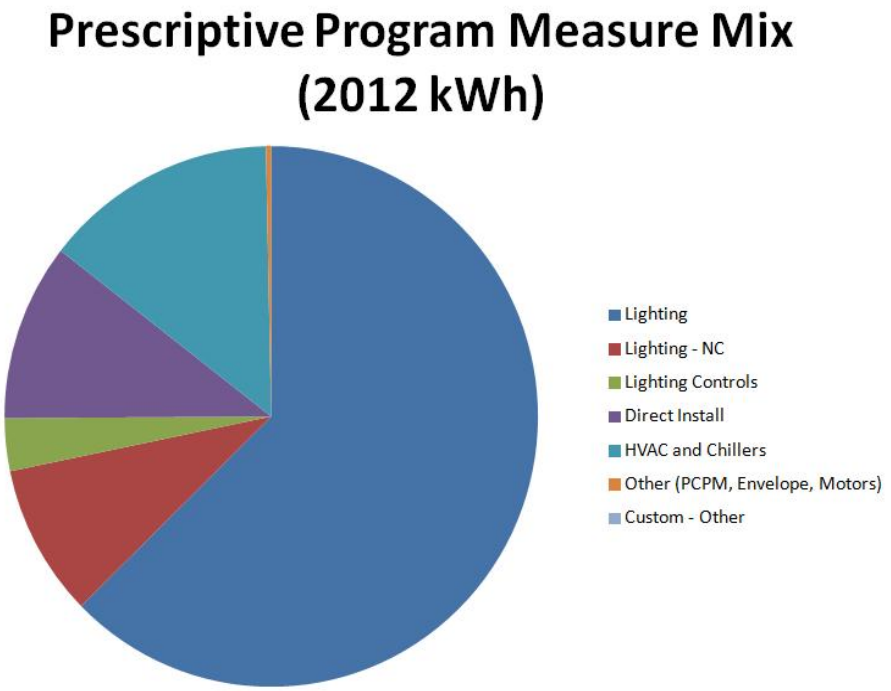
2.6.2 Program Highlights

- The 2013 C&I Prescriptive Program energy savings results showed an increase of 99% in and 91% over the 2012 program year (based on gross reported savings).

[39] Docket No. 13-002-U, Docket No. 88.

- EAI coordinate program implementation with natural gas utility programs to provide benefits to program participants. The C &I Prescriptive Program had 85 coordinated projects in 2013.
- Market Transformation metrics:
  - Trade Allies are not aligned with a single C&I Program, but the C&I Program suite now has 142 Trade Allies participating, an increase of 122% over 2012.
  - The C&I Prescriptive and Custom Programs provided 11,742 outreach efforts to potential participants by phone calls and program events or by providing program information, which is an increase of 93% over 2012.
  - Five hundred forty-five participants in the program completed projects and received incentives, which is an increase of 244% from the 2012 Program Year.
  - The measure mix in 2013 included approximately 75% lighting retrofits and approximately 12% lighting new construction and lighting controls. Although the total percentage of lighting increased as a percentage of program energy savings, the total energy savings from measures that are not lighting retrofits also increased. In addition, the HVAC and Chillers measures saw a substantial reduction in contribution to the programs, which is primarily due to a change in energy savings calculations. A comparison of the gross energy savings (kWh) measure mix for 2012 and 2013 follows.





The increased incentive level offered in the 2013 C&I Prescriptive program was successful in obtaining expanded program participation.

- The 2013 C&I Prescriptive Program increased the incentive rate from the $0.09 per kWh incentive rate in 2012 to $0.15 per kWh. The maximum incentive per project (75% of incremental cost, except for direct installation) and the total incentive per participant (no more than 50% of the program incentive budget) remained the same in 2013. This change was driven by EM&V comments in the 2012 Annual Report that suggested an incentive increase might be appropriate.
- Program implementation staff also worked with the program evaluators to add Prescriptive Program measures. Anti-sweat heater controls were added in late 2012 and reached the market in 2013. Kitchen hood ventilation controls were added in 2013 as well. The inclusion of these measures also is prompting discussion with Trade Allies on additional measures, including refrigeration systems.

Independent Evaluators Report:

> In 2013, EAI made only one change to the program, increasing the incentive from $0.09 per kWh to $0.15 per kWh in order to drive program participation. However, because of the synergies between the C&I Custom and C&I Prescriptive programs, program staff proposed and received approval from the APSC to combine the two programs in 2014. Under the new combined program structure, customers will be able to receive increased incentives for bundling prescriptive-only projects; in 2013, a project had to include at least one custom measure to qualify for the tiered incentive structure.

An analysis of the projects captured in the 2013 C&I Prescriptive Program (omitting direct installations) showed that the Prescriptive Program incentives offset approximately 54% of the incurred cost (by measure) and offset 46% of the total measure costs for installed projects in the program. This is an increase over the range of 30% to 35% seen in the 2012 Program Year. The success rate of projects that closed after receiving program assistance has also increased slightly from 40% in 2012 to 47% in 2013, indicating that incentive increases and additional outreach efforts are helping the programs gain momentum.

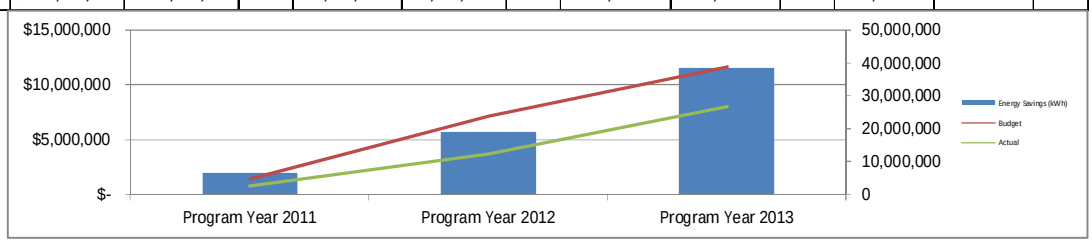
2.6.3 Program Budget, Savings & Participants:

Table 2.6.3 presents the program budget, annual energy savings, and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.6.3

C&I Prescriptive Program Budget, Savings & Participants

C&I Prescriptive												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 1,410,957	$ 749,314	53%	8,400,000	6,634,605	79%	2,000	900	45%	114	13	11%
Program Year 2012	$ 7,186,077	$ 3,714,246	52%	45,360,000	19,028,322	42%	10,600	3,011	28%	618	298	48%
Program Year 2013	**$ 11,660,532**	**$ 8,005,269**	**69%**	**75,569,000**	**38,471,904**	**51%**	**17,700**	**5,965**	**34%**	**1,030**	**734**	**71%**



Program Savings

- The 2013 annual energy savings goal for the C&I Prescriptive Program was 75,569,000 kWh. The program achieved 40,631,603 gross kWh in annual energy savings (after TRM 3.0 updates). The net energy savings for this program after evaluation was 38,471,903 kWh, based on an overall NTG of 94.68% .
- The 2013 demand savings goal for the C&I Prescriptive Program was 17,700 kW. The program achieved gross annual demand savings of 6,442 kW (after TRM 3.0 updates). The net demand savings for this program after evaluation was 5,964 kW, based on an overall NTG of 92.60%.

2.6.4 Description of Participants:

A participant in the C&I Prescriptive Program is defined as any non-residential EAI customer that has enrolled in the energy efficiency programs who will exert best efforts to approve, fund, and install projects during the program year. Participants are counted by tax ID number, and each participant can include multiple account numbers, projects, and measures.

2.6.5 Program Challenges & Opportunities

The increased incentive level offered in the 2013 C&I Prescriptive Program was resulted in expanded program participation. Economic conditions continued to limit participant funding availability or to impose more stringent capital investment criteria to justify expenditures, but the 2013 programs saw substantial growth over the 2012 program year.

Reorganization of the EAI customer service group during the latter part of 2013 is resulting in program outreach issues. These EAI personnel were pivotal in leveraging relationships to drive program interaction with managed accounts. EAI is in the process of developing the plan to minimize the reorganization impacts and determine how the programs will interact with the revised customer service team.

The Customer SD Option continues to present challenges for program success as more large customers have chosen to opt out of the program over the past year. The latest data from EAI staff show that the total energy of the customer base has declined by 12% due to the SD Option, but that the Commercial and Industrial energy base eliminated from the EAI programs due to SD certification has increased to 19%. Program staff members continue to work with EAI to promote the Commercial and Industrial programs, while attempting to make customers aware of the SD option and its limitations if a customer wants to participate in the EAI programs. Program staff members are also communicating the self-direct status of EAI account holders to Trade Allies when asked about specific accounts. This approach has reduced the number of customer service issues that result from incentive discussions with opt out account holders.

Retroactive TRM adjustments to the C&I Prescriptive Program caused substantial challenges, requiring EAI to reallocate engineering personnel to modifying all affected historical calculations for the measures in this program instead of supporting or developing participant projects. The

retroactive adjustments also caused EAI to incur additional personnel costs to support both efforts during the busiest time of the program year. The retroactive adjustments occurred late in the program year which allowed little opportunity for additional program outreach if required.

2.6.6 Program Planned or Proposed Changes to Program & Budget

The C&I Prescriptive Program will be merged with the C&I Custom Program in 2014. This will allow a more consistent approach to the large C&I sector and will add tiered incentives for projects that include only Prescriptive Program measures. The tiered incentives should increase participation where customers can leverage higher incentive rates and complete more comprehensive projects where only Prescriptive Program measures are installed. Another expected benefit of the consolidation is that it will simplify the program messaging to the marketplace and reduce confusion for participants and Trade Allies.

Feasibility studies will continue to be offered in the “combined” Large C&I Program and may include prescriptive only projects under special circumstances but are primarily intended for complex, engineered studies as would have been encountered in the Custom Program. The incentive compensation for feasibility studies of projects estimated to achieve 250,000 kWh or greater has increased to cover 50% of the study cost at the time of submission and the other 50% when the project is completed The incentive increase is intended to cover all feasibility study costs, during the 2014 program year.

The total incentive budget for the combined Large C&I Program will increase (as stated in the filing to the APSC) to accommodate the expected growth in incentives. This growth in incentive expenditure is expected to come from projects using prescriptive tiered incentives as well as the increased prescriptive incentive rates carrying forward from 2013.

The Evaluation Team included recommendations to revise the TRM and to improve the data tracking system. EAI is committed to providing good data and will continue to make process improvements. However, the retroactive TRM deemed savings adjustments must be completed under a very tight schedule that introduces the risk of higher costs and more errors.

2.7 Residential Lighting and Appliances Program

2.7.1 Program Description:

The Residential Lighting and Appliances Program is an energy efficiency program designed to educate and influence EAI residential customers to purchase and use ENERGY STAR® qualified lighting, appliances, and advanced power strips in their homes. In June 2011, the APSC approved EAI three-year energy efficiency plan for the 2011-2013 program years. The first and second years were used to establish and expand the participating retailer/manufacturer networks, introduce new measures into the program, and raise awareness of the program and energy-efficient technologies in general. In 2013, the program continued work in all of these areas.

Working with participating manufacturers and retailers, the program provided residential customers with instant savings on qualified products at the point of sale and via mail-in rebates. Eligible products included advanced power strips, ENERGY STAR® qualified Compact Fluorescent Light bulbs, Light-Emitting Diode bulbs ("LEDs"), light fixtures, and room air conditioners. Rebates also were available for ENERGY STAR® qualified refrigerators.

Lastly, the program gave retailers and manufacturers tools promote the energy- and cost-saving benefits of such products to their customers. The continued strength of this program reflects high customer and trade ally satisfaction as well as EAI's success in expanding the program through a diverse marketing and outreach strategy.

2.7.2 Program Highlights:

- Using only 64% of its overall budget, the program achieved gross annual energy savings of 36,040,501 kWh and evaluated annual energy savings of 29,525,658 kWh, which is 124% of its energy savings goal. The program also achieved 8,196 kW of gross demand savings, and 5,714 kW of evaluated demand savings, which is 181% of the program's demand savings goals.
- The program exceeded its participation goal by 55%, achieving 1,404,805 verified measures delivered.

- The program further expanded the selection of available measures and the participating retailer/manufacturer network. In 2013, the markdown program was active in 167 individual retail locations. Details are listed below in the Program Challenges & Opportunities section.
- The program continued to raise overall awareness with retail sales associates in participating locations. In 2013, the program team conducted 313 separate training sessions with sales associates.
- In 2013, the selection of LED bulbs in the program was expanded to include three new bulbs.
- To increase program awareness, the program conducted multiple outreach events such as participation at trade and home shows and demonstrations at Earth Day and retailer events. A redesign of the program website made the customer benefits of the program clearer and more enticing to site visitors. Details are listed below in the Program Events and Training section.
- The number and location of participating retail stores were adjusted to reduce leakage impacts. Details are listed in the Program Challenges & Opportunities section.
- The program successfully incorporated a retroactive savings calculation methodology when the new TRM was published in September 2013. The retroactive adjustment resulted in an after-the-fact reduction of the program's annual energy savings by 11,767,734 kWh (or 25% of the program's gross reported savings). This was the result of applying a new, lower Interactive Effects Factor (IEFe for energy savings and IEFd for demand savings) to residential lighting measures, as stipulated by the new version of the TRM (TRM v3.0). This factor was first included in the TRM in 2012 (TRM v2.0), and was at that time higher at 1.05 for IEFe and 1.10 for IEFd. In version 3.0, IEFe was reduced to 0.79 for scenarios when the heating fuel type is unknown (as it is for the majority of this program's savings), and IEFd was increased to 1.53, with an added penalty of -.011 for gas heating. The application of the new TRM formulas to lighting and other measures not only significantly impacted energy savings results at the end of the year, when there was not sufficient time to make programmatic changes, but also proved disruptive to staffing and resource plans due to the limited time and specific expertise necessary to modify calculators and IT processing tools, and to re-translate and re-upload approximately 300 individual reports to the EAI database.

- Between the months of August and November 2013, 56 locations were removed from the program to mitigate leakage identified in the 2012 annual report in those locations to manage retroactive adjustments and adjustment's impacts to cost effectiveness.

In 2013, the program diversified its Trade Ally network, adding three manufacturers and three retailers for a total of 11 large and small retailers across various retail channels. With the addition of these three manufacturers -- Cree, Energy Mad, and Globe -- the program was able to accomplish three goals: 1) introduce low-cost LED bulbs to the program, 2) run a promotion with the on-shelf provider for Walgreen's, ensuring participation in the program by all of Walgreen's locations in EAI's service territory, and 3) maintain the dollar retail channel[40] despite the loss of Family Dollar as a participant (see more on this is in the Program Challenges & Opportunities section). The three new retailers added to the program in 2013 were Dollar Tree, Metro Appliances and More, and Sears. Retailers participating for a second year include Walmart, Home Depot, Lowe's, Kroger, Sam's Club, Big Lots, Batteries Plus Bulbs, and Walgreen's. With the additions of a new dollar retailer and a small, independent retailer, the program further diversified Trade Ally participation, which inevitably leads to a greater diversity of customer participation, as well, as each channel addresses a unique demographic of residential customers.

The independent evaluator reports:

- The continued strength of this program reflects high customer and trade ally satisfaction as well as EAI's success expanding the program through a diverse marketing and outreach strategy.
- The introduction of new marketing tactics, such as new program material designs, short-term promotions, and direct mail pieces for non-CFL measures, helped broaden the program's reach.
- Many of these events were the result of collaborations with community allies, such as the Searcy Energy Smart initiative.

[40] Dollar Retailer refers to any dollar store, example Dollar General, Fred's, Dollar Tree, Family Dollar, etc.

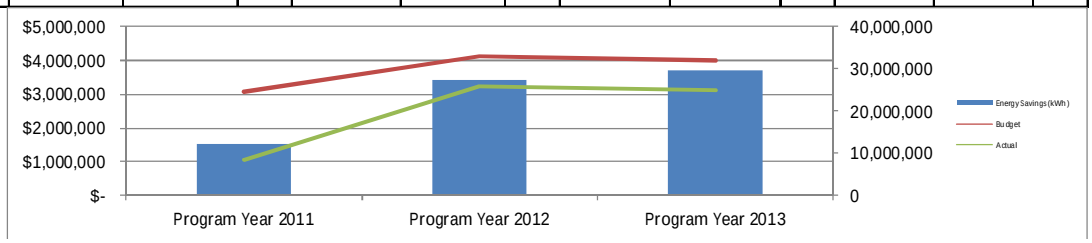
2.7.3 Program Budget, Savings & Participants:

Table 2.7.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.7.3:

Residential Lighting and Appliances Program Budget, Energy Savings & Participants

Lighting & Appliances												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 3,084,722	$ 1,058,032	34%	21,010,000	12,142,849	58%	2,700	1,361	50%	646,984	693,255	107%
Program Year 2012	$ 4,141,739	$ 3,231,819	78%	24,789,000	27,344,941	110%	3,250	3,185	98%	808,730	111,500	14%
Program Year 2013	**$ 4,002,702**	**$ 3,133,611**	**78%**	**25,818,000**	**29,525,658**	**114%**	**3,400**	**5,714**	**168%**	**905,778**	**1,404,805**	**155%**



Program Events & Training:

The Residential Lighting and Appliances Program team led 313 training sessions for sales associates in participating retail locations, which focused on program participation and processes to support seamless implementation throughout the year. To ensure quality and further reinforce program requirements, the program team also conducted inspections of participating retail locations, totaling 1,546 throughout the course of the year. Due to store location reductions in order to manage leakage, store inspections and trainings dropped by an average of 44% See more training details in the Annual Workbook Report.

Separately, the program continued to conduct outreach events to deliver energy efficient products and educational materials to constituents. Customized print collateral and marketing materials were developed for these efforts, using messaging that was found to be effective in 2012 at raising awareness and inspiring action. Some of these materials were updated to collect information that could potentially lead to participation in other programs, a best practice strategy recommended in 2012.

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Program Savings:

- The Residential Lighting and Appliances Program annual energy savings goal for 2013 was 25,818,000 kWh. The program achieved gross savings of 36,040,501 kWh, or 139% of the program's annual energy savings goal. The Residential Lighting and Appliances Program annual demand reduction goal for 2013 was 3,430 kW. The program achieved gross savings of 8,196 kW, or 188% of the program's annual demand reduction goal.

2.7.4. Description of Participants:

Participants include a diversified group of manufacturers, retail stores, and EAI customers who purchase the discounted EE measures. For purposes of counting participants, the quantity of units subsidized for each EE measure is used. For example, the filed estimate of participation for the program in 2013 (see table below) is 905,778. In 2013, a total of 1,398,791 light bulbs, 234 refrigerators, 5,230 room air conditioners, and 550 advanced power strips were subsidized through the program for a total of 1,404,805 participants.

2.7.5 Program Challenges & Opportunities:

In the second year of the Residential Lighting and Appliances Program, an expanded list of measures were offered through a more diversified network of participating retail locations throughout the service territory. Additionally, community outreach events, largely facilitated by involvement and frequent communications with EAI Customer Account Managers, afforded the program team the opportunity to interface directly with residential customers.

Cadmus analyzed program leakage in June 2012 for the participating retailers' 239 individual locations across 65 cities in EAI's service territory. Cadmus identified that between the months of August and November, 56 locations (out of a total 167 locations, or 34%) had more than 20% leakage, meaning more than 20% of the EE measure purchases were not EAI customers. EAI took steps to mitigate impacts of leakage in the program by removing the 56 retailers from upstream CFL promotions, which resulted in an evaluated leakage value of 28.8% for 2013, a

decrease of 3.8% from the evaluated leakage rate in 2012. While CFL promotions were no longer available to customers at these retailers, discounts on LED bulbs, light fixtures and refrigerators continued to be available. In 2014, the program team will look for opportunities to offer promotions in these areas which offer the possibility for customer verification. While this may initially reduce the volume of participation in these areas, it is anticipated that the savings garnered from these types of promotions will be closer to final evaluated savings figures.

Working with large and small businesses, such as Heifer International and community organizations like Arkansas Hunger Alliance, UAMS, and the Arkansas Department of Human Services, provided the opportunity for direct interaction with residential customers. Similarly, outreach events held in store locations with retailer partners such as Lowe's and Home Depot allowed for direct, personal interaction with shoppers. Such interaction allowed the program team to provide education and, in some cases, free energy efficiency measures, and to collect customer information. These outreach events were, however, very resource and cost intensive, which limited the program team's ability to implement the program using this methodology on a larger scale.

While most of the program's Trade Allies see the value that utility partnerships bring in the form of lower prices, energy savings, beneficial efficiency education and product knowledge for customers, other financial considerations come into play when deciding whether to participate in utility programs. Some retailers do not realize a financial benefit to their business from participation. This is because utility discounts may appear as a reduction in top line sales due to the reduced sales price of incented items, and despite utility reimbursements, this loss is not corrected in internal accounting reports. In these cases, the retailer may decide not to participate in utility programs, or will not appropriate resources to manage utility programs, leading to delays in reporting, reporting inaccuracies, and often, payment delays. Family Dollar is an example of a retailer that voluntarily discontinued participation in the program in 2013 following habitual delays in reporting. These and other challenges (such as sales data sharing) are the focus of a group of retailers participating in a national Retail Action Council ("RAC"). The activities and outcomes of the RAC are closely monitored by EAI and CLEAResult, as adoption of the best practices guidelines distributed by the group, provide an opportunity for the program to distinguish itself as best-in-class.

Targeted direct mail correspondence, combined with print collateral pieces given out during outreach events, drove increased awareness in the program. Likewise, larger discounts on certain products for a limited time drove increased participation in certain locations. The program team was able to address product shortage issues experienced in 2012 during limited time promotions by training sales associates on inventory management. This was not an issue in 2013.

Retroactive changes in the methodology for calculating savings for products, which resulted from an updated version of the technical reference manual, proved disruptive to program implementation and reporting. The retroactive change also made planning and forecasting, an essential part of a program that relies on retailer participation, more challenging**.** The retroactive change also impacted savings reported for the program. Despite these challenges, the program team was able to recalculate and manually reload 256 individual savings reports to the shared database at the end of the year. This followed a significant alignment effort to ensure matching calculations, file formats, and layouts.

2.7.6 Program Planned or Proposed Changes to Program & Budget:

In 2014, EAI will continue to explore new cost-effective measures, and expansion of non-lighting measures already in the program, and continue those direct outreach methods which proved successful in 2013. Additionally, in 2013, and as a result of the leakage adjustments in 2012, closer scrutiny of participating locations' proximity to service territory boundaries resulted in a reduced number of participating locations across the service territory. In 2014, EAI will continue to explore alternative implementation methodologies in those locations which experienced a reduced number of participating retail locations.

In 2014, the program will continue to utilize successful data management processes, ensuring reported savings and evaluated savings are closely matched. This also will facilitate successful program planning for EAI.

Schedule 2.7.6: Energy Efficiency Measures Changes

Existing Measure	Added to 2013 Program	Removed from 2013 Program
CFL Spiral bulbs CFL Specialty bulbs CF Fixtures Advanced Power Strips Room A/Cs LEDs Refrigerators	 Expanded selection of LED bulbs	CF Ceiling Fan light kits

The Independent evaluator recommendations for this program are data related and particularly related to TRM updates. EAI is committed to providing good data and will continue to make process improvements. However, the retroactive TRM deemed savings adjustments must be completed under a very tight schedule that introduces the risk of higher costly and more errors.

2.8 Agricultural Irrigation Load Control

2.8.1 Program Description

EAI's Agricultural Irrigation Load Control Program ("AILC") is designed in accordance with the conservation and energy efficiency benefits and objectives set forth in the C&EE Rules. The Program Year 2013 is the fourth year of the AILC Program Plan originally approved by the Commission's Order No. 6 in Docket 08-072-TF issued March 10, 2010. On June 30, 2011 the Commission issued Order 39 in Docket 07-85-TF extending the AILC Program approval for an additional fourth year through 2013 and closing Docket No. 08-072-TF, thereby transferring the program into the purview of Docket No. 07-085-TF as part of EAI's EE Plan and EE portfolio of programs.

The AILC Program provides incentives in the form of billing credits for eligible customers in return for allowing EAI to interrupt their irrigation pumps up to three hours during peak times of the day for the summer months of June, July, and August. The AILC Program is implemented by EAI through a combination of in-house resources along with third party vendors. EAI owns and maintains the equipment, and provides overall administration services for the program. Third party vendors are used to supply the meters and control equipment, communications equipment, cellular service, equipment installation, equipment maintenance, creation of required software components, and marketing. EAI pays incentives to the participants in the form of billing credits during the program year. The 2013 billing credits were calculated at $4.16 per kW up to a maximum of 30% of the monthly electric bill. In addition to billing credits the participants receive other benefits such as real-time notifications of the program interruptions and internet access to manage their accounts and remotely operate their participating wells.

Challenged by under-enrollments in 2011 and 2012, the 2013 AILC Program plan adjusted upwards the approved recruitment target from 300 new enrolled well locations to 700. The plan estimated these 700 accounts would represent 32 MW of new contracted load,[41] which would equal approximately 16 MW of new interruptible load.[42] The 2013 plan projected EAI would

[41] "Contracted Load" refers to the total of the maximum load registered at the location over the last three years.

[42] "Interruptible Load" refers to the average of the actual available load during curtailment time periods. Since on average ½ of the wells are not pumping at any given time during the season, historical data shows this load is approximately ½ of the contracted load.

reach a four-year cumulative total of 1,800 participating accounts with 72 MW of contracted load and 36 MW of interruptible load. The AILC Program did not meet its 2013 plan participation target and only added 275 new accounts. After experiencing 50 opt-outs, the program saw a net of 225 new accounts. This brings the cumulative enrollment since inception to 1,438 wells. Of these 1438 locations, only 995 accounts were active for the 2013 season. The contracted load for these 995 accounts was 34.5 MW. Of the 995 active accounts enrolled in the program, a maximum of 854 meters were scheduled for interruptions with an independently verified interrupted load average[43] of 7.6 MW, which compares with independently verified interrupted load average of 6.02 MW in the 2012 program year. The maximum metered interrupted load[44] in 2013 was 11.47 MW, as compared to 9.1 MW in 2012.

The 2013 Program Year experienced an unseasonable and extended cold winter with snow falling in the Arkansas delta as late as May. Additionally a wet, cool and late spring delayed planting season for many farmers. This long cool season delayed or all together eliminated the need for some irrigation wells in 2013.

2.8.2 Program Highlights

- In Program Year 2013, EAI implemented new software and processes to minimize failed curtailments. However, during 2013 test curtailments and throughout the interruption season, other software deficiencies were discovered. One deficiency delayed and shortened the July 17 curtailment event, but the defects did not cause the interruption to fail. The source of the problem relates to the number of meters. As the number of meters has expanded, the software pre-process times have become longer, now requiring a two-hour process window to schedule curtailments.
- In Program Year 2013 the number of curtailments events continued to be reduced in order to minimize the impact on the farmers in order to retain participation. Of the 65 days available for curtailment, EAI limited the curtailment events to nine days. Four of these nine days were only used to test the equipment.

[43] "Independently Verified Interrupted Load" refers to the average calculated by CADMUS for the program year of the demand savings for all curtailment events. On average the program savings achieve a realization rate. These savings are estimated at the point of use and thus do not include line losses.
[44] "Maximum Metered Interrupted Load" refers to the cumulative raw meter data recorded by EAI ½ hour prior to a curtailment event.

- In Program Year 2013, EAI developed features that allowed it to identify participants who routinely bypassed the control switch by turning their service off with the main disconnect switch above the meter. This action effectively disabled the meter and load controller. A switch tag notification was created and deployed to alleviate this occurrence, which was causing as much as a 20% failure rate in curtailments.
- In Program Year 2013, process improvements and improved data collection helped in creating a list of customers receiving billing credits from the program while equipment issues prevented the accounts from curtailments. These accounts were notified of corrective actions and informed the credits would not continue until equipment issues were resolved and their load is curtailable.
- EAI registered 5.2 MWs of demand response as a Load Modifying Resource in MISO for 2014.
- The independent evaluator reported that the AILC Program surpassed its demand reduction goal of 7.99 MW by 3%.

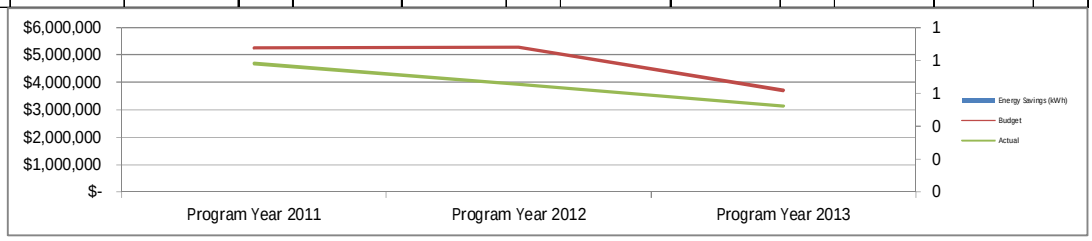
2.8.3 Program Budget, Savings & Participants

Table 2.8.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.8.3

AILC Program Budget, Energy Savings & Participants

Agricultural Irrigation Load Control												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 5,263,492	$ 4,686,563	89%	0	0	-	19,100	9,472	50%	1,100	928	84%
Program Year 2012	$ 5,268,164	$ 3,925,228	75%	0	0	-	12,200	6,020	49%	1,800	1,033	57%
Program Year 2013	**$ 3,717,478**	**$ 3,137,809**	**84%**	**0**	**0**	**-**	**8,000**	**7,576**	**95%**	**400**	**198**	**50%**



Program Events & Training:

In February, March and April 2013, the AILC Program conducted mass media buys in radio, internet banner ads and newspaper to market the remote control ability feature of the AILC equipment. Customer training videos and PowerPoint presentations also were upgraded at the AILC website.

Training for the AILC Program involved a compressed but substantial level of internal training for enrollment, installation, and operations and maintenance:

- In March 2013, 19 Customer Service Representatives attended three separate sessions of classroom instruction course on the Agricultural Irrigation Load Control Program and account enrollments. These specialists on the AILC Program encouraged enrollment through the well activation season.
- April 15, 2013 seven Installation crew members received 8 hours of classroom installation training from EAI meter operations.
- During the months February through June 2013, EAI staff presented the AILC Program to and held question and answer sessions at several Arkansas delta county Farm Bureau meetings.

Program Savings:

There were no deemed savings in this program because it is a load control program. On the last day of the 2013 season, a maximum of 874 accounts were scheduled for interruptions with 87% (757) successfully reporting curtailments. On July 17, 2013 (EAI's third highest peak usage day for 2013) a maximum actual metered interrupted load of 7.3 MW was successfully curtailed. This compares with 9.1 MW of actual interrupted load in the 2012 Program Year. All results are verified by an independent third party who used actual 15 minute interval data from each account with equipment installed to interrupt.

2.8.4 Description of Participants

A participant is an EAI agricultural irrigation pumping account that is receiving program incentives.

2.8.5 Program Challenges & Opportunities

The 2013 experience reinforced EAI's appreciation for the need of improved management systems for operation monitoring, including outage response. The season's experience also exposed the need for automation of the account data entry and account maintenance. It also revealed the possibility of market saturation in certain rural counties. Some of these challenges were:

- Program Goal attainment - The program met only 32% of its demand reduction goals and fell short of participation goals by almost 50%. To meet the condensed and aggressive revised recruitment goals, EAI started an aggressive marketing program early in 2013. The mass media, face to face events and product demonstrations all focused on three focal points:
    - Remote control capabilities for the farmer;
    - Equipment reliability and ease of use; and
    - Program incentives.

A survey conducted after the curtailment season revealed 87% (66 out of 76) of non-participants were familiar with the program but not enroll. These results can be interpreted as either the program has reached its market saturation or the program must be modified to entice participation. In 2013 EAI requested the APSC to approve a modification of the program's billing credit rider under the expectation that a simplified rider and billing credits would lead to increased participation as part of the rate case and the rider change was approved. Furthermore, EAI decided the program should target counties with a history of low program participation.

- Operational Issue #1 System Load - In 2013 the program experienced an unusually cool and wet summer, which caused farmers to delayed or altogether cancel planting for many crops. This reduced the load for agricultural pumping and resulted in fewer opportunities to curtailment irrigation pumps during the summer months. EAI called for nine interruptions with four events lasting less than three hours for software testing and equipment enhancements.
- Equipment Issues #1 - In 2013 EAI augmented the effort to complete all maintenance calls and new service requests prior to the end of the curtailment season, thereby eliminating carry-over service calls. At the completion of this effort, a number of accounts were determined not to be capable of having AILC Program equipment installed due to customer equipment deficiencies or lack of access to the customer's equipment. The program has supported enabling billing credits when the customer enrolls and has not penalized the customer while waiting for equipment. The identified account owners were notified by mail of the site/equipment deficiencies and informed of the de-enrollment of these un-curtailable locations.
- Equipment Issues #2 – Equipment and software enhancements completed in 2012 assisted in identifying in 2013 well locations where the pumps' main disconnect switch above the metering equipment was open. This action disconnects the metering and load control devices and prevents load interruption. In 2013, switch tag notices were created and used to mitigate these occurrences and to inform the participants of the effects. The switch tag conveyed a firm yet cordial message instructing the participant to either stop the use of this Company controlled switch or voluntarily opt-out of the program.
- Equipment Issues #3 – The manufacturer of the Load Control Devices used to disconnect the load has informed EAI it will no longer build the device and will outsource fabrication that will result in a higher cost, which is yet to be determined.

- Software Issue #1 – Software logic used to verify meter load status continued to yield inconclusive results. Connection/disconnection failures were reported where none existed.
- Software Issue #2 – Automation software developed to integrate current customer information for enrollment, equipment installation, and management reporting failed to reconcile all inconsistencies between enrollment data, EAI customer support software, EAI field support software, and metering support software.
- Operational Issue #2 MISO Requirements – In 2014, MISO will require a four hour interruption in order for interruptible load to qualify as a Load Modifying Resource. Current program design only allows up to a three hour interruption. In order to meet the four-hour window, the available interruptible load will need to be split into staggered curtailments. Current curtailment software does not allow for this configuration. Software will need development.

Program Outlook for Continuation, Expansion, Reduction or Termination:

In 2014, the billing credit rider will be simplified as a result of a tariff modification approved in EAI's base rate case. Implementation of these modifications simplifies the credits by removing the 30% cap limit and making the credit apply to metered load as opposed to billing load. EAI plans to implement the 2014 AILC Program at the approved budget level of $4.131 million[45]. In 2014, a new load control device will be tested at limited locations. The new load control devices are more durable and compact and include state-of-the-art communications, metering, and curtailment technology. The new devices are operated through specialized, proprietary curtailment software which meets or exceeds current software capabilities. The 2014 plan is to utilize existing legacy equipment through its useful life by retrofitting the equipment with the new devices. If the new devices test out successfully in 2014, EAI will explore possible cost savings opportunities for the program in future years by combining, reducing or eliminating select operational activities and associated costs. The testing is planned to be accomplished with no increased cost, reduction in service to the participating customer, or acquisition of new accounts into the program.

[45] 2013 Budget prior to EAI Rbudget in 2013 as provided by Commission approved budget flexibility.

2.8.6 Program Planned or Proposed Changes to Program & Budget

Taking into account 2013, and previous program experiences the AILC Program plans to modify several processes for the 2014 program year as follows:

- Integrate and test improved technology and equipment in 2014. There is no additional cost for this activity which has the potential of reducing future program costs.
- Develop improvements to the curtailment software to implement staggered events to comply with the MISO four hour requirements. The cost is already included in the 2014 budget.
- Continue to promote the benefits of the program, which enable participants to remotely turn on and turn off well switches from smartphones and computers. Feedback from participants and noon-participants indicate that this is a welcome and needed enhancement.
- Capitalize on sponsored agricultural events and opportunities to inform farmers through partnerships with Farm Bureau county offices. Activities include placement of materials, presentations at monthly meetings, and participation in fairs and events of importance to farmers. The cost is already included in the 2014 budget.
- Increase marketing outreach through the targeted use of bill inserts, and more frequent mailings. Focus the mailing and outbound telemarketing on prospective farmers that are not currently participating in the program and that are located in the under-represented counties. The cost is already included in the 2014 budget.

The Evaluation Team did not identify specific recommendations for the AILC Program in 2013.

2.9 Energy Efficient Arkansas ("EEA")

- The EEA Program's objective is to cost-effectively deliver relevant, consistent, and fuel neutral information and training that causes people to consume less energy through energy efficiency and conservation measures. By leveraging the knowledge, experience, and skills of the Arkansas Energy Office and the combined resources of the undersigned utilities, the EEA Program will be able to deliver that information and training in the most cost-effective manner as required for statewide energy efficiency.

- For more information about this program please see the EEA report as filed by the Arkansas Energy Office on April 1, 2013 in Docket No. 07-083-TF.

2.10 Arkansas Weatherization Program

- The Arkansas Weatherization Program ("AWP") is a joint statewide program that leverages the low-income community action agencies as program implementers and administrators to provide weatherization and energy efficiency improvements to severely inefficient homes throughout the state of Arkansas.

- For more information about this program please see the AWP report as filed by the Arkansas Community Action Agency Association on April 1, 2014 in Docket No. 07-079-TF.

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2.11 New Homes Program

2.11.1 Program Description:

The New Homes Program is designed to increase the supply of qualified home builders that are motivated to design, build, and independently verify energy-efficient homes (both High Performance and ENERGY STAR® certified) in the EAI service territory. The program accomplishes this objective by providing incentives to local home builders who complete and submit certification of the construction of qualified energy-efficient new homes in the EAI service territory. The Program also helps establish and create demand for new, energy-efficient homes in Arkansas. This objective is accomplished by encouraging and supporting a network of well informed and educated residential construction professionals who understand the benefits of building and selling energy-efficient homes. The program serves EAI residential customers who purchase (and repurchase) these homes, as well as generating consumer awareness of energy, cost, and comfort improvements associated with energy-efficient homes.

The integrated residential new construction outreach and recruitment initiative includes home builders, Home Energy Rating System Raters, and HVAC companies. The core message to the home builder is that in a market where true product differentiation provides competitive advantage, the New Homes Program will enable participants to demonstrate technical distinction, as well as take advantage of recognizable energy efficiency branding. HERS Raters and HVAC companies also are encouraged to participate via approved home builders to retain their current client base, as well as expand it with new home builders. Two main eligibility requirements must be met in order to participate in the program: (a) the newly constructed home must be verified as having EAI electric service, and (b) the home must meet current program guidelines.

2.11.2 Program Highlights:

The New Homes Program 2013 highlights include:

- The program saved 75,423.00 gross kWh in 2013. With an 85.01% realization rate and a net-to-gross ratio of 0.72, this results in 46,166.40 kWh net savings. The net savings are equivalent to 31.8 metric tons of carbon dioxide, or carbon dioxide emissions from

burning 34,180 pounds of coal, or the amount of carbon sequestered by 816 tree seedlings grown for 10 years.[46]

- Twenty-four New Homes Rebates were processed (four Tier 2 High Performance Homes, and 20 Tier 3 ENERGY STAR® homes) and $22,400 of incentives paid.[47]
- The program
    - Conducted builder recruitment meetings at Home Builder Associations and HERS Rater offices;
    - Conducted sales training session to educate builders on how to better sell energy efficient homes;
    - Sent email blasts to 350 home builders and targeted outreach for specific meetings;
    - Developed the Turner and Sons Construction Case Study to cross promote success stories; and
    - Developed a pay-for-performance program modification to increase participation and rebates in 2014.

2.11.3 Program Budget, Savings and Participants

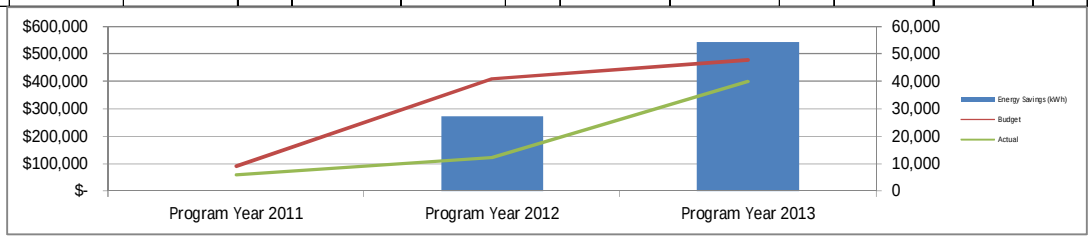
Table 2.11.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

[46] Carbon emission equivalents determined using the Greenhouse Gas Equivalencies Calculator developed by the United States Environmental Protection Agency.
[47] High Performance homes meet ENERGY STAR® V2.5 guidelines, whereas ENERGY STAR® certified homes meet current V3.0 guidelines.

Table 2.11.3

Energy Star® New Homes Program Budget, Savings & Participants

Energy Star New Homes												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 90,000	$ 60,988	68%	0	0	-	0	0	-	0	0	-
Program Year 2012	$ 408,801	$ 121,847	30%	723,000	27,383	4%	200	8	4%	300	15	5%
Program Year 2013	**$ 478,107**	**$ 398,544**	**83%**	**1,084,000**	**54,305**	**5%**	**300**	**17**	**6%**	**450**	**24**	**5%**



2.11.4 Description of Participants:

The program's participants include HERS Raters, HVAC Companies, and home builders primarily constructing new, single family homes in EAI service territory. For purposes of counting program participants in the annual report, a participant is a new home with an EAI active account number and has received program incentives.

2.11.5 Challenges and Opportunities

The fundamental challenge of increasing the availability of newly constructed single-family residences is overcoming a misperception by many home builders that few potential homebuyers are willing to pay a reasonable, price premium for energy-efficient homes. To be successful, home builders must accept this belief and, in return, potential homebuyers need to be able to easily identify these energy-efficient homes. Thus, the program strategy aims to provide EAI customers with an accessible and easily identifiable choice when it comes to shopping for new residential homes.

Production home builders often drive the energy-efficient new homes market. However, the residential home building sector in Arkansas was hit particularly hard by the recent economic

downturn. In 2013, ICF analyzed the EAI temporary meter lists, which is an indication of new home construction. The analysis indicated that temporary meter requests from May through September 2013 increased by 4% compared to the period January through May 2013, which indicates the new home market maybe beginning to come back in EAI's service territory however, has not made had any real growth for program to be as successful as designed . The program paid incentives for 24 homes in 2013. Based on this, 16% of temporary meter requests were likely submitted to the program for incentives.

Effect of ADFA Homes on EAI Program

In recognition of the large number of homes built with Arkansas Development Finance Authority ("ADFA") funding, EAI and ICF developed a savings rebate tier for those homes that were 15% of the ADFA building guidelines. In 2013, 181 homes that pursued ADFA funding were submitted for inclusion in the EAI New Homes Program. Of these 181 homes, 178 homes either did not exceed the baseline adequately or the builder determined the costs to pursue 15% above the ADFA baseline could not be justified. Three homes qualified for the custom tier, with a 15% improvement over the user defined reference home developed for ADFA homes.

Builder	# of Homes	Reason	Result
Builder 1	3	Meets custom tier but not ENERGY STAR® due to ADFA	Applying for Custom Tier
Builder 2	3	Doesn't exceed ADFA baseline by 15%	Not eligible
Builder 4	41	The homes are receiving alternative funding from ADFA and the extended baseline to qualify for EAI incentives are too costly to justify additional expense.	Not eligible
Builder 5	100	Doesn't exceed ADFA baseline by 15%	in progress trying to meet custom tier requirements
Builder 6	34	Doesn't exceed ADFA baseline by 15%	Not eligible (constructed 4th quarter 2012)

This limited volume of new residential construction negatively impacted the ability to achieve program savings goals. Only 20 ENERGY STAR® New Homes were built in the EAI service area in 2013 because the costs associated with meeting current ENERGY STAR® guidelines were viewed as too great as reported by home builders within the EAI service territory.

2.11.6 Planned or Proposed Changes to Program & Budget:

The 2013 New Homes Program opened on January 1, 2013 with three unique incentive levels:

- Tier 1: $300 for each Special Rate home. This rebate applies to developments and projects that receive special funding with above code requirements. These homes are reviewed and approved on a case by case basis.
- Tier 2: $600 for each High Performance home, based on ENERGY STAR® Version 2.5 guidelines.
- Tier 3: $1,000 for each ENERGY STAR® certified home, based on current ENERGY STAR® guidelines.

In response to the low 2013 participation levels, EAI developed the a pay for performance modification for the 2014 Program Year. This new design adopts a broader New Homes incentive structure that provides incentives to home builders based upon the total projected energy savings achieved above the current 2004 Arkansas Energy Code (2003 IECC). This modification still requires builders to have an independent HERS Rater model and test the home, but the incentive amount would be based upon projected energy savings rather than the HERS Index (which includes gas savings). The table below provides information on the new Program options and incentives:

Table 2.11.6a: 2014 Whole House Path Incentive Structure

Whole-House Path

$/kWh incentive	Minimum 5% of whole-home savings required	$0.40
10% Savings Bonus	10%	$200
15% Savings Bonus	15%	$250
20% Savings Bonus	20%	$300
30% Savings Bonus	30%	$350
Bonus Incentive for ENERGY STAR Certification		*$100*
Maximum Incentive Per Home (including bonuses)		*$1,500*

Whole-House Approach

$/kWh incentive	Minimum 5% of whole-home savings required	$0.40
No bonus until 10%	0%	$0
10% Savings Bonus	10%	$200
15% Savings Bonus	15%	$250
20% Savings Bonus	20%	$300
30% Savings Bonus	30%	$350
Bonus Incentive for ENERGY STAR Certification		*$100*
Maximum Incentive Per Home (including bonuses)		*$1,500*

In addition to this modification, the 2014 New Homes Program also will adopt a prescriptive component that provides incentives to home builders to install more efficient air conditioners, heat pumps, windows, and lighting. This component of the 2014 New Homes Program will not require an independent HERS Rater to model and test the home. All prescriptive verifications will be conducted by program staff. The table below provides information on the new program options and incentives:

Table 2.11.6b: 2014 Prescriptive Path Incentive Structure

Prescriptive Path*

ENERGY STAR HVAC Equipment	$0.25 per sqft of CFA
ENERGY STAR HVAC Equipment SEER 16+	$0.35 per sqft of CFA
ENERGY STAR Windows & Doors	$1 per sqft of windows/doors
ENERGY STAR Lighting Package (80% lighting)	$50 per home
**(must install 2 components to qualify)*	

Prescriptive Approach

ENERGY STAR HVAC Equipment	$0.25 per sqft of CFA
ENERGY STAR HVAC Equipment SEER 16+	$0.35 per sqft of CFA
ENERGY STAR Windows & Doors	$1 per sqft of windows/doors
ENERGY STAR Lighting Package (80% lighting)	$50 per home

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The independent evaluator recommended revisiting the program design and incentive levels to attract new builders. EAI will consider this recommendation and consider if incentives levels can be changed at program funding levels in a cost-effective manner**.**

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2.12 Multifamily Homes Program

2.12.1 Program Description:

The Multifamily Homes Program provides direct installation of cost-effective energy efficiency measures in the tenant's units and a common area energy survey for multifamily properties throughout the EAI service territory. The program was designed to benefit owners and residents of multifamily dwellings in EAI's service territory through increased energy efficiency in their homes and at their properties. The program accomplished its filed energy saving goals by providing measures such as CFL bulbs, high efficiency showerheads, and faucet aerators. These products were directly installed by a trained ICF team with the assistance and permission of the property manager. These direct installation measures were provided at no cost to either the property managers or the tenants. After the team completed the product installations, each tenant received educational information about the products installed. A property-wide measure summary report is mailed to the property manager after the installation is completed This report provides an overview of the measures installed and the estimated energy efficiency savings of those measures.

After the installation is complete, a Building Performance Institute certified technician conducts an energy survey on the common areas of the property and conducts quality control verifications on the units. A report of energy efficiency recommendations and suggestions for participation in other Entergy Solutions energy efficiency programs is mailed to the property manager.

EAI increased awareness of energy efficiency by educating tenants and property managers about the benefits of having energy saving measures installed on their properties. This is accomplished with tenant leave-behind cards, the property measures summary report, and the property common area survey and report.

2.12.2 Program Highlights:

The 2013 program:

- Saved 765,415.41 gross kWh in 2013. With a 97.66% realization rate and a net-to-gross ratio of 0.95, this resulted in 713,412.91 kWh net energy savings. The net savings are equivalent to 492 metric tons of carbon dioxide, or 6.5 tanker trucks worth of gasoline, or the amount of carbon sequestered by 403 acres of U.S. forest in one year.[48]
- Completed installations in 1,962 total multifamily units at 73 properties.
- Created awareness among multifamily property owners, managers and residents with an Area Agency on Aging press release.
- AC Tune-Up Program Developed:
    - Introduced a Multifamily A/C Tune-Up Program as a new measure.
    - Trained an HVAC contractor in 2013 to complete tune ups for installations beginning in 2014.
    - Established a pipeline for the A/C tune-ups in 2014.
- Insulation Rebate Program Developed:
    - Introduced the Multifamily Insulation Rebate as a new measure.
    - Began outreach to eligible properties and contractors to participate in 2014.
- The Multifamily Program implementation staff successfully installed measures at 11 properties in Arkansas' southeastern corner, which represented roughly 10% of all 2013 participating properties.

Cadmus recognized improved program coverage in geographic areas throughout the state in 2013 after the Evaluation Team identified untapped program potential in Southern Arkansas in 2012. In addition, Cadmus survey results indicated the majority of participants were very satisfied with the direct install measures as well as with EAI as an electric service provider. Cadmus also reported that program staff completed all of the 2012 program recommendations during the 2013 program year (8 of the 9 recommendations were completed and 1 was no longer relevant).

[48] Carbon emission equivalents determined using the Greenhouse Gas Equivalencies Calculator developed by the United States Environmental Protection Agency.

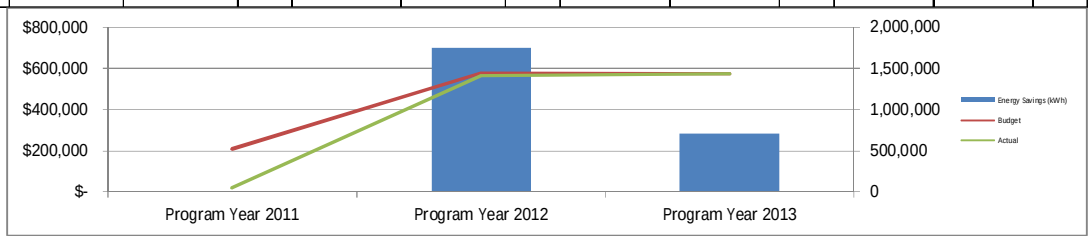
2.12.3 Program Budget, Savings and Participants

Table 2.12.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.12.3

Multifamily Homes Program Budget, Savings & Participants

Energy Solutions for Multi-Family												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 209,505	$ 22,097	11%	273,000	0	0%	100	0	0%	245	0	0%
Program Year 2012	$ 578,474	$ 567,348	98%	364,000	1,753,019	482%	100	205	205%	326	3,075	943%
Program Year 2013	**$ 575,128**	**$ 573,725**	**100%**	**455,000**	**713,413**	**157%**	**100**	**95**	**95%**	**408**	**1,962**	**481%**



2.12.4 Description of Participants

Multifamily properties composed of five or more units located within the EAI electric service territory are eligible as participants in the EAI Multifamily Homes Program. Properties under a residential, multifamily, or commercial rate code all qualify for this program. There are no maximum limits on the size of a building or number of qualifying buildings in a single complex. Funds are limited and services are available in select geographic areas on a first-come, first-served basis.

2.12.5 Challenges and Opportunities

The program's success in 2012 left a robust and eager pipeline of multifamily participants for 2013. Participating property managers provided the program positive feedback. A formal

survey is being developed in 2014 to send to participating property managers to better monitor customer feedback.

The addition of the pilot programs for AC tune-ups and insulation rebates will provide opportunities for increased energy efficiency for selected properties in 2014. The pilot programs also will enhance the interaction of programs implemented through EAI's implementation contractors.

Currently, after the measure installations are completed, each tenant receives educational information about the measures installed. In 2014, the program will expand the educational opportunity for both tenants and property managers by offering a presentation on energy efficiency at each multifamily complex willing to participate.

Retroactive EM&V and TRM Adjustments Impacts

The modifications in energy efficiency savings calculations from TRM 2.0 to TRM 3.0 negatively impacted the savings for the Multifamily Homes Program. The gross program savings achieved in 2013 according to TRM 2.0 were 961,864.4619 kWh, 20% more than the gross savings reported according to TRM 3.0, which was 765,415.41 kWh. This TRM adjustment had the most significant impact in driving the program cost effectiveness negative in 2013.

2.12.6 Planned or Proposed Changes to Program & Budget

There are no proposed changes to the budget, but the following program changes are planned for 2014:

- Introduce new measures: multifamily A/C Tune Ups and insulation rebates and will complete the installations in 2014.
- Send a formal survey to participating multifamily property managers to better assess customer feedback.
- Develop educational presentations on energy efficiency to present to tenants at participating multifamily properties.

The independent evaluator recommends that the implementer prioritize verifying the measures installed for the 2014 program year. EAI will review this recommendation to

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determine whether the extra cost can be accomplished within program funding levels and in a cost-effective manner. Cost-effectiveness continues to be problematic with this program; therefore, EAI will continue to explore options to improve cost effectiveness.

2.13 Manufactured Homes Program

2.13.1 Program Description:

The Manufactured Homes Program was designed to improve energy efficiency and benefit the owners and residents of manufactured homes and parks in EAI's service territory. The program accomplished its filed energy saving goals by providing direct installation measures such as CFL bulbs and high-efficiency, low-flow showerheads and kitchen and bathroom aerators to targeted manufactured homes. These direct installation measures were provided at no cost to either the park owners or its residents. In addition, through this program EAI lowered the educational barrier to energy efficiency by educating tenants and owners about the benefits of installing energy saving measures on their properties. Tenants present during the installation received an energy assessment and received personalized tips on how to improve their home's energy efficiency. At the end of the process, they were asked to fill out a customer satisfaction survey. Residents also were informed of other EAI energy efficiency programs. A measures summary report is mailed to the customer after the installation providing an overview of the measures installed in the home with estimated savings.

2.13.2 Program Highlights:

- 703,362.5682 gross kWh of electricity saved in 2013. With a 96.45% realization rate and a net-to-gross ratio of 0.92, this results in 626,613.23 kWh net savings. The net savings are equivalent to 432 metric tons of carbon dioxide, or the carbon dioxide emissions from 1,004 consumed barrels of oil, or the amount of carbon sequestered by 354 acres of U.S. forest in one year.[49]
- Completed installations in 1,015 total manufactured home units.
- Increased program participation by hiring bilingual staff to reach out to Hispanic residents.
- Received positive feedback from customers on the program through the formal customer survey and through direct quotes. Over 98% of participants were satisfied or very satisfied with the program.

[49] Carbon emission equivalents determined using the Greenhouse Gas Equivalencies Calculator developed by the United States Environmental Protection Agency.

- Educated customers about other energy efficiency measures that they could implement and other EAI EE programs available to them. Cadmus confirmed in its evaluation that the installers carry other residential EAI program brochures and make in-person recommendations during site visits when appropriate.
- Used bill inserts, mail-outs, and referrals to reduce canvassing time and increase participation.
- Cadmus survey results indicated the majority of participants were very satisfied with the direct installation measures and with the program overall, giving a "very satisfied" or "somewhat satisfied" rating in every category.
- Cadmus reported that program staff completed all 9 of the 2012 program recommendations during the 2013 Program Year.

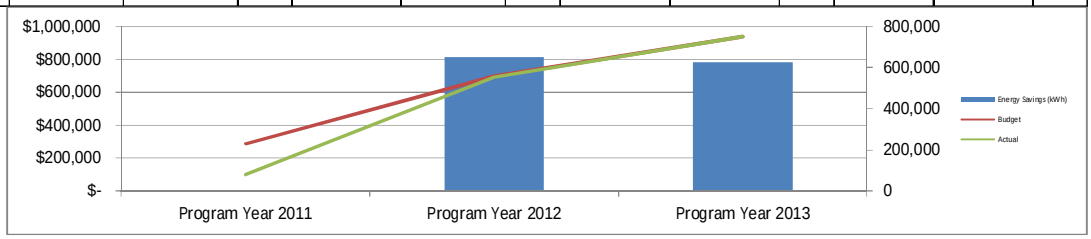
2.13.3 Program Budget, Savings and Participants

Table 2.13.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.13.3

Energy Solutions for Manufactured Homes Program Budget, Savings & Participants

Energy Solutions for Manufactured Homes												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 289,508	$ 100,644	35%	214,000	0	0%	200	0	0%	606	0	0%
Program Year 2012	$ 698,290	$ 690,623	99%	427,000	650,756	152%	300	76	25%	1,213	840	69%
Program Year 2013	**$ 936,575**	**$ 935,574**	**100%**	**641,000**	**626,613**	**98%**	**500**	**79**	**16%**	**1,819**	**1,015**	**56%**



2.13.4 Description of Participants

Manufactured homes taking residential service from EAI qualify for fuel appropriate measures in this program. These homes are typically located within a park or complex, and there are no maximum limits to the size of a park or complex.

2.13.5 Challenges and Opportunities

The greatest challenge with this program has been generating leads. Canvassing mobile home parks door-to-door is the primary means for obtaining program participants. In 2012, the program developed outreach materials, such as informational flyers and promotional door hangers, to assist canvassing efforts. In 2013 additional measures, such as bill inserts and direct mailers, helped increase leads and reduce time spent recruiting customers. These recruitment methods will continue in 2014 with the addition of a Refer-a-Friend campaign to reach more customers. This campaign will provide an incentive to program participants who refer other eligible customers that actively participate in the program. The program also will use promotional yard signs in 2014 to increase participation, consumer recognition, and credibility while performing installations in a manufactured home park.

A large percentage of the residents living in manufactured housing in Arkansas are Hispanic. Program participation increased by hiring bilingual staff for canvassing and installs. Additionally, all program literature includes information in both English and Spanish. In 2013, the program purchased 30 minutes of radio time for a live interview, thirty 60- second program spots, and 10 live mentions on , La Pantera, the Little Rock Hispanic radio station, to promote the program to Spanish speaking customers. Maintaining bilingual staff and promotional materials in 2014 are essential for a successful program.

Retroactive EM&V and TRM Adjustment Impacts

The modifications in energy efficiency savings calculations from TRM 2.0 to TRM 3.0 negatively impacted the savings for the Manufactured Homes Program. The gross program energy savings achieved in 2013 according to TRM 2.0 were 819,626.1928 kWh, 14% more than the gross energy savings reported according to TRM 3.0, which was 703,362.5682 kWh. This

retroactive change in TRM values significantly and negatively impacted the cost effectiveness of the program in 2013.

2.13.6 Planned or Proposed Changes to Program & Budget

There are no proposed changes to the budget. The program will introduce new outreach methods to increase program participation in 2014, including implementing the yard signs and the Refer-a-Friend campaign, with a quarterly prize drawing for those customers who refer a friend that participates in the direct installation program.

The independent evaluator recommended that the implementer prioritize verifying the measures installed for the 2014 program year. EAI will review if the extra cost can be accomplished within program funding levels and in a cost-effective manner.

This program continues to result in poor cost effectiveness. EAI will continue to explore options in 2014 to move this program to positive cost-effectiveness.

2.14 Residential Benchmarking Pilot Program

2.14.1 Program Description:

To achieve EAI residential energy savings and customer experience goals, the Residential Benchmarking Pilot Program is designed to influence a customer's energy usage through societal pressures.

The Residential Benchmarking Pilot Program is a turnkey behavioral program that includes high-impact home energy reports, an online rewards portal, and integrated multi-channel marketing services. The home energy reports use proven behavioral science techniques to promote continuous improvement in energy efficiency among target recipients.

These reports are complemented by the online rewards portal, an advanced web-based application that provides personalized energy-saving recommendations based on the customer's unique energy profile. The online rewards portal tracks energy-saving measures taken by a customer and presents the energy-savings over time. Customers earn rewards points based on the amount of energy saved each billing period. The reward points can then be redeemed for gift cards at popular national and local retailers. Enrolled program participants receive a monthly email summarizing their rewards points earned in the last billing period, and directing them to the online portal for personalized energy-saving tips.

2.14.2 Program Highlights:

The Residential Benchmarking Pilot Program achieved 9,380,303.10 kWh net savings in 2013. The net savings are equivalent to 6,466 metric tons of carbon dioxide, or the carbon dioxide emissions from 889 homes' electricity use for one year, or the amount of carbon sequestered by 5,300 acres of U.S. forest in one year.[50]

In 2013, a quarterly home energy report was sent to a treatment group of 100,000 targeted households, providing year-over-year home energy use analysis, customized energy saving tips, and encouraging the household to join the online program.

[50] Carbon emission equivalents determined using the Greenhouse Gas Equivalencies Calculator developed by the U.S. Environmental Protection Agency.

By year-end 2013, 15,633 residential EAI customers had opted-in to the online portal. The online portal drives persistent energy savings by employing behavior change techniques that incent customers to install technology-based measures with deemed lifetime savings. The approach to customer engagement revolves around three key areas:

1. Earn points for reducing energy use – Customers can earn rewards points each month based on year-over-year energy savings. Monthly usage is calendar-normalized and weather-adjusted in order to provide a relevant year-over-year comparison. Points can be redeemed for gift cards at national and local retailers. Most popular rewards include Walmart, Amazon.com, Target, Chili's, Gander Mountain, iTunes and Groupon gift cards.
2. Show how much energy can be saved by taking an action – Energy saving recommendations are tailored based on energy use analytics, customer demographics and customer home profile characteristics.
3. Show how much energy is saved after taking an action – The impact of the recommendations is tracked over time, which encourages customers to take more actions in the future.

The Residential Benchmarking Pilot Program has the ability to cross-promote other EAI energy efficiency programs, including both electric and gas initiatives. The online portal has the ability to spotlight and promote high-impact programs and link directly to related sites for a seamless customer experience. A key focus in 2014 will be to cross-promote other EAI programs to targeted users via the online portal.

The online portal was upgraded in August 2013. The primary enhancements were improved navigation, more targeted energy saving recommendations, expanded rewards, and an improved user experience. Since the online portal upgrade, there have been over 25,000 visits to the website. Visitors are viewing an average of 4.7 pages per visit and spending an average of 5.9 minutes on the site per visit.

Enrolled EAI customers reported taking more than 180,000 energy savings actions in 2013, including washing larger loads of dishes, replacing home lighting with CFLs, and using a ceiling fan instead of air conditioning.

Protocol J[51] requires EAI to maintain a control group for every year in which program impacts are evaluated and every few years after the program has been running for several years. The program design continues to include a control group to enable savings observations over time. Cadmus stated in its 2013 EAI Evaluation Report: "[T]he first cursory observation of savings persisting is evident in the fact that energy savings continue to outpace goals. The treatment appears to be having the desired effect of encouraging behavior changes that result in energy savings in aggregate."

The home energy reports promote a variety of no-cost, low-cost, and technology-based measures. Once an EAI residential customer has implemented behavior change, proven technology measures, and/or energy efficient home improvements, he/she will continue to benefit from these savings measures. The home energy reports serve as an important introductory education tool to spark customer thinking and participation by helping customers realize that they can save through comparison awareness. Once a customer knows the savings potential and understands where to learn more, get help, earn rewards, connect easily to utility rebate programs, and receive compelling promotions the printed version of the benchmark, the report becomes less important.

To minimize the free-ridership associated with incentive programs, the Entergy Solutions Rewards Program is designed to incent based on actual energy savings so participants earn rewards for actually taking the actions that create lasting energy savings. Participation in the program creates awareness and connection, creating a higher likelihood for the users to save energy in the future.

Based on the 2013 EAI Evaluation Report by Cadmus, customers who more actively engaged with the program have significantly higher awareness of EAI's energy-efficiency programs. Based on a customer survey administered by Cadmus, 59% of online program participants recalled receiving energy-saving information from EAI, compared to 40% of passive users.

Based upon the CADMUS report, more than 95% of home energy report recipients were satisfied with and found value from the program-related information they received

[51] Arkansas Public Service Commission, "Arkansas TRM: Protocol J: Behavior-Based Program Evaluation Protocol." 2012.

Nearly three-quarters (74%) of online participants took an average of five energy-saving actions in their home during 2013. Unprompted, respondents most often mentioned replacing light bulbs with CFLs or LEDs. Online program participants were more aware of actions they could take to improve the efficiency of their homes, and their behavior reflected that awareness.

The program is a pilot to address five questions.

- What are the verifiable energy savings and demand reductions that this program achieves for EAI's residential customers?
- How do these energy savings persist over time, with and without the continued delivery of the energy benchmarking reports?
- What are the free-ridership and spill-over effects of this program?
- Could this program be utilized for all of EAI's customers in a future program years?

The following discussion are responses to the pilot questions.

What are the verifiable energy savings and demand reductions that this program achieves for EAI's residential customers? The program achieved net energy savings of 9,380,303 kWh in 2013. The program produced measurable and verifiable energy savings through educating, incentivizing and rewarding consumers to take simple and practical home improvement steps and conservation actions based on proven energy efficiency measures with known energy reduction values. Entergy Solutions Rewards Program participants can pledge to take specific energy efficient actions to reduce their energy consumption. Actual energy consumption is tracked based on utility billing data, and a correlation can be derived between self-reported customer behavior and actual energy savings. The program achieved 6.37 MW of demand reduction (294% of the goal) in 2013.

Table 2.14.6 Rewards Program Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	6,328	9,380	**148%**
Demand Savings (MW)*	2.17	6.37	**294%**

**These values represent evaluated net savings and reflect the application of an 8.49% line loss factor.*

How do these energy savings persist over time, with and without the continued delivery of

the energy benchmarking reports? The 2013 EAI Evaluation Report from Cadmus reported that "the first cursory observation of savings persisting is evident in the fact that energy savings continue to outpace goals. The treatment appears to be having the desired effect of encouraging behavior changes that result in energy savings in aggregate." EAI residential customers not only took behavioral actions to save energy, but they also installed technology-based measures with deemed lifetime savings, such as installing programmable thermostats and low-flow showerheads. The installation of such measures will begin to help the program's persistent energy savings to increase beyond one year as currently provided through the TRM and independent evaluation.

What are the free-ridership and spill-over effects of this program? The Entergy Solutions Rewards Program is designed to minimize the free-ridership associated with incentive programs, by providing incentives for actual energy savings, so participants earn rewards for actually taking the actions that create lasting energy savings. Participation in the program creates awareness and connection, creating a higher likelihood for customers to save energy in the future. Enrolled customers reported have reported taking more than 180,000 energy savings actions, including washing larger loads of dishes, replacing home lighting with CFLs, and using a ceiling fan instead of air conditioning.

Could this program be utilized for all of EAI's customers in a future program years? While the program marketing is currently targeted to a treatment group of 100,000 households, the program is open to all EAI residential households. In future years, the marketing can be expanded to a larger segment of EAI's customers, and the program can progress from a pilot to a fully-executed program that can be utilized by all of EAI's customers. This is a proven, but not cost-effective program that is simple and easy to use for all residential customer groups, making it a relevant energy-saving program for all segments of residential customers. Because this program is partially based on a software technology product that is already installed and fully scalable, expanding the program across EAI's residential customers is affordable and seamless. When all residential customers have the option to participate, energy savings will increase and traditionally hard to reach utility customers will now have new options for participation. Energy savings recommendations and rewards offers can be targeted to customer segments based on demographics, household profiles and usage/consumption behavior. Over 15,600 EAI residential customers have opted-in to the online program.

Finally, Cadmus' 2013 Evaluation Report stated, "As the Rewards program has demonstrated success in achieving savings, the Team supports efforts to continue implementing the pilot as a full program with the current program design, either within the current program planning cycle or beginning with the 2016-2018 program cycle."

Even with most of the questions being confirmed in the program has not yet achieved cost-effectiveness and cannot be recommended to move from a pilot status.

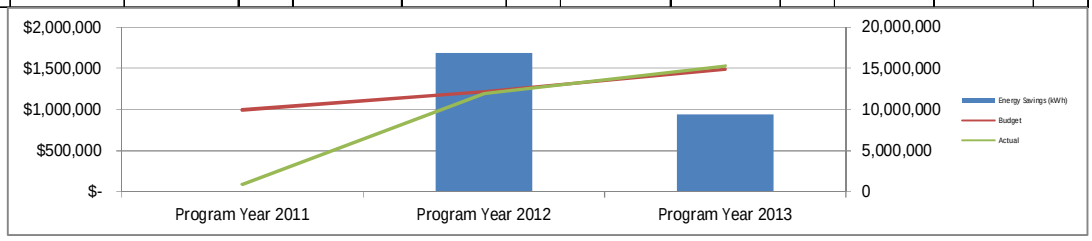
2.14.3 Program Budget, Savings, and Participants:

Table 2.14.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.14.3

Residential Benchmarking Pilot Program Budget, Savings & Participants

Residential Benchmarking Pilot												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 996,000	$ 96,087	10%	12,656,000	0	0%	4,300	0	0%	50,000	0	0%
Program Year 2012	$ 1,217,224	$ 1,192,405	98%	6,328,000	16,840,944	266%	5,500	0	0%	100,000	382,966	383%
Program Year 2013	**$ 1,487,462**	**$ 1,528,523**	**103%**	**6,328,000**	**9,380,303**	**148%**	**2,200**	**6,374**	**290%**	**100,000**	**100,000**	**100%**



2.14.4 Description of Participants

Treatment and control group participants were selected for the Residential Benchmarking Pilot from the larger EAI residential population. One hundred fifty thousand users were selected to be part of the program, and were randomly assigned to the treatment group (100,000 users) or the control group (50,000 users). Residential Benchmarking Pilot participants fall into three categories:

- Online Participants: EAI residential customers who have opted in to the online portal. Online users may have been part of the original 100,000 treatment group, or may have been from the larger EAI population. Online participants receive monthly energy saving tips emails after enrolling in the program.
- Offline Participants: EAI residential customers who are from the 100,000 treatment group and have not opted in to the online portal. These offline participants received quarterly direct mail home energy reports, along with other program marketing and savings messages in 2013.
- Control Group: EAI customers who have the same account and usage characteristics as the original 100,000 treatment group. Members of the control group do not receive any program marketing, home energy reports, or program-related savings messages.

For purposes of reporting number of participants within the annual report, a participant is the sum of EAI customer accounts that are in the online and offline participants**.**

2.14.5 Program Challenges & Opportunities:

The Residential Benchmarking Pilot Program is an innovative program that reaches out to customers on a personal level. This type of communication and marketing can provide excellent exposure for EAI's EE programs. The web portal portion of this program will provide an opportunity for EAI to sell and cross promote not only its own EE programs, but also those programs of other utilities in the cooperative. A key focus in 2014 will be to cross-promote other EAI programs to targeted users via the online portal.

The Residential Benchmarking Pilot Program will continue to employ 2013 marketing techniques to increase online program sign-ups in 2014. Marketing efforts may include direct

marketing (direct mail and/or bill stuffers), email, phone calls, digital banner advertising, and social media advertising. These marketing techniques are designed to reach customers in a sequenced manner that reinforces a consistent message through various media channels, and contributes to the overall effectiveness of the campaign. Customer responses to each marketing program are monitored and measured to gauge the impact of slight variations in the presentation format of each program. Modifications are made in real time to optimize program and campaign performance, helping ensure EAI's energy savings goals are met. For example, after a lukewarm response to the first direct mail marketing campaign (which included both savings tips and promoted signing-up for the online program), subsequent marketing campaigns were modified to either focus on savings tips or focus on increasing online enrollments. The simplified messaging proved to be much more effective, as measured by significantly higher response rates.

The Residential Benchmarking Pilot Program services were interrupted from October 2012 through March 2013, due to ownership changes of the vendor and a subsequent due diligence of EAI to ensure IT and customer confidential data security. This change in ownership impacted the ability to receive customer data and load the data into the web portal. Inability to launch the program's marketing campaigns negatively impacted enrollment and program savings in 2013.

A focus in 2014 will be to optimize the online participant enrollment process. Currently, users are required to provide their EAI utility account number when enrolling in the online program. Some users do not complete the enrollment process because they do not have their EAI utility account number readily available. Efforts will be made in 2014 to simplify the account verification process.

The original treatment group of 100,000 EAI residential users has experienced some attrition since the program launched in 2012 due to closed or moved accounts. In 2014, both the treatment and control group will be replenished with approximately 10,000 new EAI customers who meet the program criteria (for example, lived at their residence for a minimum of 13 months). The treatment group and control group will be homogenous in composition.

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2.14.6 Planned or Proposed Changes to Program & Budget:

The Residential Benchmarking Pilot Program marked its first complete year during 2013. The program focus in 2014 will be to maximize energy savings among online and offline participants, creating a highly-engaged online customer base that is actively committed to their energy pledge and utilizing the online tools and resources to manage their household energy usage. The program will continue to focus on driving persistence of energy savings in 2014 by promoting a mix of no-cost, low-cost, and technology-based measures, which drive lifetime energy savings. No-cost, low-cost, and technology-based measures will be promoted via the online portal, monthly engagement emails, and home energy reports.

2.15 Residential Direct Load Control

2.15.1 Program Description:

The Summer Advantage Program is designed to reduce peak electricity demand at the point of use in EAI's service territory. A Digital Control Unit (DCU) that is installed on or near the customer's outside air conditioning or heat pump unit allows for cycling of the outside unit during peak electricity demand periods reducing electricity usage. The inside fan is allowed to operate normally to circulate cool air while the outside unit is cycled off.

Customers have a choice between 50% cycling and 75% cycling. Customer Incentives based on customers choice of 50% cycling or 75% cycling. All Summer Advantage participants will receive two incentive payments: an installation incentive and an annual incentive. Customers who are selected for the Measurement and Verification program will receive an additional installation incentive and annual incentive.

- Installation incentive. Upon successful installation of the DCU, the customer receives an installation incentive based on participation rate; those at the 50% participation rate receive $25 and those at the 75% participation rate receive $40.

- Annual incentive. The annual incentive is offered to Summer Advantage customers as recognition for their participation in the program throughout the year. The annual incentive is based on the customer's participation rate and the number of months during the Cooling Season (June 1 to September 30) in which the customer participates. Customers at the 50% participation rate are eligible to receive a total of $25 and those at the 75% participation rate are eligible to receive a total of $40. Customers who elect to be removed from the program during Cooling Season will receive a prorated annual incentive based on:
    - Partial payment based on customer participation rate on the last day of each of the four Cooling Season months and paid at a rate of $6.25 per month for the 50% participation rate or $10 per month for the 75% participation rate;
    - Customers will receive full credit for the first month of participation; and
    - Customers will receive NO credit for the last month of participation.

Customers who have more than one air conditioner or heat pump will be paid an installation and annual incentive for each outside unit that is installed on the program.

2.15.2 Program Highlights:

2013 was a very successful year for the Summer Advantage Program and included the following highlights:

- The demand savings goal was exceeded by 251% per Cadmus' 2013 Program Year report;
- EAI registered 13.2 MW of demand response as a Load Modifying Resource within MISO; and
- 5,625 air conditioners (also known as endpoints) were installed bringing the program total to 13,328 endpoints installed.

Independent Evaluator Reports

- In 2013, Comverge increased the number of metered M&V sites from 25 to 120 to ensure the sample stratification continued to reflect the characteristics of the DCU population which increased significantly throughout 2012.
- Arkansas had a cooler than average curtailment season, which limited dispatch events.

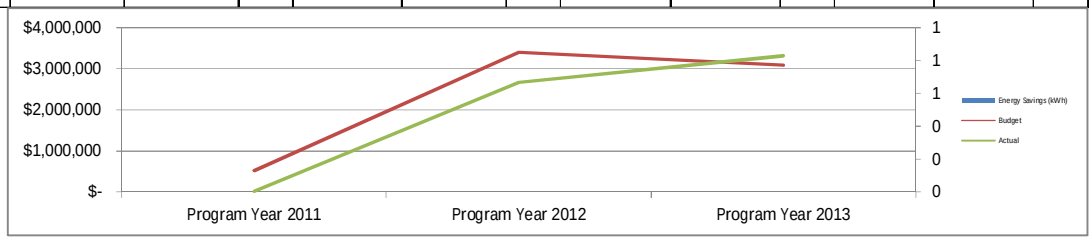
2.15.3 Program Budget, Savings, And Participants:

Table 2.15.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.15.3

Residential Direct Load Control Program Budget, Savings & Participants

Residential Direct Load Control												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 517,588	$ 9,899	2%	0	0	-	3,100	0	0%	3,001	0	0%
Program Year 2012	$ 3,401,324	$ 2,671,152	79%	0	0	-	7,300	2,592	36%	10,000	2,597	26%
Program Year 2013	**$ 3,075,405**	**$ 3,312,919**	**108%**	**0**	**0**	**-**	**5,200**	**12,041**	**232%**	**15,003**	**11,935**	**80%**



Program Events & Training:

The Summer Advantage Program was touted by the Summer Advantage Field Supervisor at various events including the Searcy Energy Smart City event and at EAI meetings and offices to include:

- EAI Manager Customer Service Representative Meeting;
- EAI Searcy Office - Customer service representatives and servicemen meeting;
- EAI Little Rock Markham Office – Servicemen manager meeting;
- EAI Hot Springs Office - Customer service representatives and servicemen meeting; and
- EAI Little Rock Baseline Office – Servicemen meeting.

Program Savings:

Three qualifying curtailment events (temperature above 95 degrees at the Little Rock Airport) were conducted in 2013 on June 13, July 10, and August 7. The results are shown in Table 2.15.4 below. For contractual requirements, the highest 15 minute kW reduction was used and that kilowatt factor (kWF) measurement was 1.38. For sustained load reduction, the average load reduction was used and that kWF measurement was 1.04.

Table ***2***.15.4. Summary Of Curtailment Events

Event Date	Active Devices	Highest 15 Minutes kWF	Highest 15 Minutes total kW	Average Load Reduction kWF	Average Load Reduction total kW
June 13, 2013	11,438	1.21	13,840	0.96	11,031
July 10, 2013	11,627	1.32	15,348	1.05	12,240
August 7, 2013	11,676	1.38	16,113	1.04	12,094

2.15.4 Description of Participants:

Any EAI residential customer who has an air conditioner or heat pump in good working condition is eligible to participate in the Summer Advantage Program and is eligible to receive program incentives. Summer Advantage participants who request to be removed from the program will no longer be counted as a participant.

2.15.5 Program Challenges & Opportunities:

The Residential Direct Load Control Program will allow EAI to better manage peak load events. The 2014 load shed target is 24 MW with a maximum of 25 MW. Using the kWF measured in 2013 (1.38) for planning purposes, at least 17,400 endpoints are targeted to be installed prior to the first curtailment event in 2014.

Opportunities: Response to direct mailings continues to be strong. While many of the spring 2013 installations resulted from enrollments obtained in 2012, two direct mailers have netted over 2,400 additional enrollments. EAI customers continue to be interested in the program.

Challenges: Email marketing campaigns have a significantly lower cost than direct mail campaigns; however, the success rate in Arkansas with email campaigns has been very low. Direct mail in Arkansas has had a penetration rate of over 3%, while email penetration rates have been less than 1%. Going forward, EAI will need to tap all cost effective marketing methods.

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2.15.6 Planned or Proposed Changes to Program & Budget:

A change to the Measurement and Verification Plan is being developed to align with the MISO load reduction calculation methodology. This change will standardize all load reduction calculations for the Summer Advantage Program. While the new calculation methodology will not affect the amount of load reduction, it will affect how the load reduction amount is reported. Specific calculation methodology will be available in the 2014 Measurement and Verification Plan.

The independent evaluator recommended reviewing the efficacy of the two-tiered incentive structure to determine if each tier's contribution to savings is proportionally aligned with program design intentions. EAI will review the recommendation and consider program changes after also reviewing customer impact, cost to program, and cost effectiveness.

2.16 Agricultural Energy Solutions Program

2.16.1 Program Description:

The Agricultural Energy Solutions ("AES") Program is designed to reduce energy usage among agribusiness owners in EAI's service territory through custom and prescriptive incentives, farmer energy efficiency education, and educating agricultural suppliers. The program seeks to accomplish these goals by lowering the barriers within this sector, such as the lack of easy access to qualified vendors and installers, the lack of information and awareness of the benefits of participation and financial incentives to overcome the first cost barriers of energy efficiency measures.

2.16.1 Program Highlights:

- 2,179,464.624 gross kWh of energy were saved in 2013. With a 100% realization rate and a net-to-gross ratio of 0.89, this results in 1,939,723.52 kWh net savings. The net savings are equivalent to 1,337 metric tons of carbon dioxide, or the annual carbon dioxide emissions from 281 passenger vehicles, or the amount of carbon sequestered by preserving 10.3 acres of U.S. forests from conversion to cropland in one year.[52]
- In 2013, the program established relationships with numerous agricultural businesses, government agencies, row crop farmers, and poultry farmers across the state. Establishing program awareness throughout the EAI service territory was instrumental in achieving the 2013 energy savings goal.
- Developed Variable Frequency Drive rebate for irrigation pumping.
- Increased the custom track by implementing an LED custom lighting measure option.
- Developed a poultry lighting case study that promotes the program to farmers.
- Cadmus survey results indicated that program participants were satisfied with all aspects of the EAI program.
- Cadmus recognized that program staff provided participants with information of other complementary EAI solutions programs, as well as programs offered by the U.S. Department of Agriculture Natural Resource Conservation Service and University of Arkansas Cooperative Extension Service.

[52] Carbon emission equivalents determined using the Greenhouse Gas Equivalencies Calculator developed by the United States Environmental Protection Agency.

- Cadmus reported that AES Program staff completed or made progress on all of the 2012 program recommendations during the 2013 program year (15 of the 16 recommendations were completed, with 1 recommendation still in progress).
- Cadmus reported that AES Program staff tailored the program to the market by creating compelling new measures for customers to participate that helped diversify measure uptake.

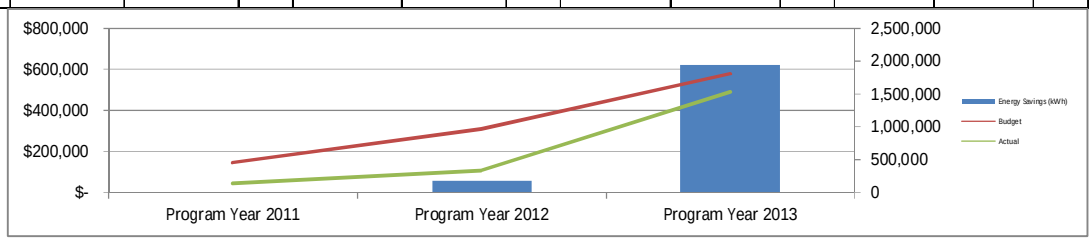
2.16.3 Program Budget, Savings and Participants

Table 2.16.3 is the program budget, annual energy savings and number of participants from workbook Table 5 as required by the Rules for Conservation and Energy Efficiency Programs, Section 9: Annual Reporting Requirements and Order No. 18 in Docket 06-004-R.

Table 2.16.3

Agricultural Energy Solutions Program Budget, Savings & Participants

Agricultural Energy Solutions												
	Cost			Energy Savings (kWh)			Demand Savings (kW)			Participants		
Program	Budget	Actual	%	Plan	Evaluated	%	Plan	Evaluated	%	Plan	Actual	%
Program Year 2011	$ 147,188	$ 47,476	32%	326,000	0	0%	100	0	0%	38	0	0%
Program Year 2012	$ 307,925	$ 108,428	35%	652,000	177,222	27%	200	22	11%	75	4	5%
Program Year 2013	**$ 577,559**	**$ 491,796**	**85%**	**1,304,000**	**1,939,724**	**149%**	**400**	**268**	**67%**	**150**	**62**	**41%**



2.16.4 Description of Participants

Any agricultural customer that receives electric service from EAI is eligible for the Agricultural Energy Solutions Program at its facilities receiving electric service from EAI.

The following rate codes are eligible:

- Agricultural Pumping (AP);
- General Farm Service (GFS);

- Small General Service (SGS) that are agricultural business; and
- Large General Service (LGS) that are agricultural business.

For purposes of this program, a customer is defined by a single Federal Tax ID number. Organizations with multiple locations are considered a single customer, regardless of how many EAI account numbers they may have.

2.16.5 Challenges and Opportunities

The agriculture sector contributes 12% to Arkansas's Gross Domestic Product, which is twice the national average. Savings opportunities are available but there are challenges and market barriers to overcome to accomplish these savings. The major challenges associated with the program include:

- The agricultural sector is traditionally hard to reach because this sector traditionally relies more on a word of mouth approach rather than traditional mass marketing;
- Extreme drought and cold weather can create financial hardship. This hardship can cause limited funding for energy efficiency investments;
- The agricultural sector is seasonal and requires precise timing to conduct proper marketing efforts;
- Many farmers are not risk takers and can be reluctant to invest in new technologies to improve energy efficiency;
- Even with financial incentives, some farmers lack funds to invest in energy efficiency improvements; and
- It can be difficult to gain trust in the tight-knit agricultural community.

Although there are many challenges, the program implemented strategies to overcome these barriers. Employee experience in agriculture is very important; farmers are more willing to listen and trust someone who they can easily relate to. These barriers are being overcome by hiring an Account Manager with a strong agricultural background. The manager accessed the rural communities and gained the customers' trust through successful one-on-one meetings with farmers and partners to gain trust in the farming community.

EAI and its implementing partner, ICF, also developed solutions for the seasonal marketing barriers associated with agriculture. Row crop farmers are extremely busy during the planting and harvesting season. Marketing efforts were adjusted accordingly to address this issue. Marketing efforts now focus on row crop farmers during the winter and early spring months, and poultry farmers during the summer and fall months.

2.16.6 Planned or Proposed Changes to Program & Budget

In 2014, EAI and ICF will investigate the viability of expanding the custom track with additional potential measures that may qualify for an incentive. Adding additional measures will increase customer participation while Vision[53] reporting improvements will provide an in depth look of the data entered in the system such as creating a report indicating the results of marketing activities. Some measures to be investigated are:

- Pump tune-ups;
- Poultry ventilation tune-ups;
- Grain bin energy saving technologies; and
- The Evaluation Team did not identify any program-specific recommendations in 2013.

The program database will be updated in 2014 to capture how the participant learned about the program. Having this information will provide a better understanding of what marketing resonates with the participants and how to effectively target potential participants.

Retroactive EM&V and TRM Adjustment Impacts

The modifications in energy efficiency savings calculations from TRM 2.0 to TRM 3.0 did not impact the savings for the Agricultural Solutions program.

[53] Vision is a database of ICF that uploads electronic filed data and provides inputs into the EAI ARCEE database.

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3.0 Supplemental Requirements

3.1 Staffing

The 2013 programs had five full-time staff members and an EE program manager plus one full-time employee to assist in marketing and communications coordination. The Certifications, education, and experience of the EAI staff makes for a strong team. Of the five staffers, four are degreed engineers with customer service, market planning, product development, construction project experience and transmission planning and transmission project management experience. Four of the five staff members have Association of Energy Engineers certified Business Energy Professional, one of the staff is a certified Leadership in Efficiency and Environment Design ("LEED") with experience in commissioning LEED commercial buildings. One employee is a certified Measurement and Verification Professional and a certified Project Manager Professional. Four of the five staff members have Master's degrees in either business or engineering. The utility also leveraged many other non-incremental employees to promote the programs, provide benefit cost analysis, regulatory, legal support, back office billing, contractor recruitment for irrigation load control program.

One of the EAI staff members was promoted in January 2014. EAI is in the process recruiting a new staff member for the replacement.

None of the non-incremental employees used more than 50% of their annual man-hours supporting the programs.

3.2 Outreach/Stakeholder

EAI is involved in all of the Commission order stakeholder processes. The commission order stakeholder activates are not listed. EAI considers stakeholders to be customers, trade allies, trade and state agencies that provide both informative feedback to enhance program delivery and acceptance. The table below is a representation of the small group or one-on-one stakeholder activities that occur throughout the year. Further, all

training activities provide opportunities for the collaborative exchange of ideas and enhancements. Those training session can be found in the 2013 Tabular Report.

Event No.	Date	Stakeholder Meeting	Meeting Purpose/Results
1	January 1-31, 2013	Trade Allies (Farm Bureau, Farm Credit, Dixion Poultry)	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
2	January 18, 2013	Arkansas Annual Rice Meeting	Provided program material to Trade Allies participating in the event, informing of participation requirements and program overview. (avg. training time 15 min per person)
3	January 25-24, 2013	Arkansas Water Well Contractors Association 45th Annual Winter Meeting and Trade Show	Provided program material to Trade Allies participating in the event and spoke to audience during the VFD work shop informing of participation requirements and program overview.
4	January 29, 2013	Arkansas Soybean Association Annual Meeting	Hosted a booth at the event providing program material and program participation requirements to participating attendees.
5	February 1-31, 2013	Entergy Arkansas Farm Customer Meetings	Spoke to farmers and Entergy Arkansas employees, detailing program benefits and opportunities while also providing program material and informing of participation requirements.
6	February 1, 2013	2013 Agri-Expo	Hosted a booth at the event providing program material and program participation requirements to participating attendees.
7	February 13, 2013	ASU Agribusiness Conference	Provided program material to farmers and professors at the Conference.
8	February 22, 2013	2013 Rural Life Conference	Presented a PowerPoint presentation during the energy meeting while also providing program material and informing of program participation requirements.
9	March 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
10	March 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
11	March 6, 2013	C&I Electric Meeting	Spoke to C&I and Entergy Arkansas employees, detailing program benefits and opportunities while also providing program material and informing of participation requirements.

12	April 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
13	April 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
14	April 9, 2013	New Homes Program Recruitment Meeting	Provided information and presented a PowerPoint overview of the New Homes Program at the monthly Hot Springs Home Builders Association meeting.
15	April 10, 2013	NRCS Farm Energy Meeting	Presented a PowerPoint presentation during the energy meeting while also providing program material and informing of program participation requirements.
16	April 17, 2013	New Homes Program Recruitment Meeting	Provided information and presented a PowerPoint overview of the New Homes Program at the monthly White County Home Builders Association meeting.
17	April 23-24, 2013	Arkansas Poultry Federation Spring Symposium	Hosted a booth at the event providing program material and program participation requirements to participating attendees.
18	April 25, 2013	Central Arkansas Development Corp	Presented an overview of EAI energy efficiency programs to El Dorado CADC program participants.
19	May 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
20	May 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
21	May 7, 2013	New Homes Sales Training Session	Provided information and presented a PowerPoint on how to explain and incorporate energy efficiency/ENERGY STAR into the builders' sales process
22	May 9, 2013	New Homes Program Recruitment Meeting	Provided information and presented a PowerPoint overview of the New Homes Program at the monthly North East Arkansas Home Builders Association meeting.
23	June 1-30, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
24	June 1-30, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
25	June 13, 2013	New Homes Program Financial Incentives	Presentation to builders on the financial incentives for homebuilders who build energy efficient homes

26	June 14, 2013	New Homes Program Financial Incentives	Presentation to builders on the financial incentives for homebuilders who build energy efficient homes
27	July 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
28	July 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
29	August 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
30	August 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
31	August 6-7, 2013	Irrigation Pumping Plant Performance Testing Workshop	Provided program material to Trade Allies, and Farmers. Also provided breakfast for those who attended the event.
32	September 1-30, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
33	September 1-30, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
34	October 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
35	October 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
36	October 11-20, 2013	Arkansas State Fair	Provided program material for AES, MA, MF, NH, and BB to all interested participants at the Arkansas Energy Booth
37	November. 1-30, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
38	November. 1-30, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)
39	December 1-31, 2013	One on One Meetings	Meet with framers individually to provide program material and also to inform them of program participation requirements.
40	December 1-31, 2013	Trade Allies	Provided program material to Trade Allies, informing of participation requirements and program overview. (avg. training time 15 min per person)

41	January 7 -8, 2013	Economic Opportunity Day	Lighting Demo, APS Demo, Program (s) training
42	January 16, 2013	AEE Meeting	LED to Fluorescent Comparison
43	February 19, 2013	Trade Ally Summit	Trade Ally Summit
44	February 19, 2013	AEE Meeting	VFD's
45	February 22 - 24, 2013	Little Rock Home Builders Association Home Show	Lighting Demo, APS Demo, Program (s) training
46	February 23, 2013	UALR Science Olympiad	Lighting Demo, APS Demo, Program (s) training
47	February 27, 2013	Program Introduction	Presentation on Program to ADEQ
48	February 28, 2013	Searcy Chamber of Commerce "Searcy Energy Smart" Kick-Off Event	Lighting Demo, APS Demo, Program (s) training
50	March 7, 2013	Baldour EE Seminar	VFD's/Motors/OG & E C&I incentive program
51	March 8 - 9, 2013	Russellville Home Show	Lighting Demo and Program(s) training
52	March 20, 2013	AEE Meeting	Utility Incentive Program Intros
53	March 25, 2013	Little Rock Engineers Club	Program (s) training for all residential programs and commercial programs

54	March 28, 2013	Pulaski Technical College Lighting and Energy Efficiency	Overview of lighting and energy efficiency measures and emerging technologies
55	Various times throughout 2013	Entergy Solution Commercial Programs Trade Ally Training	Participating Contractor Training
56	April 5 - 6, 2013	Twin Lakes Builder's Assoc. Home Show	Lighting Demo and Program(s) training
57	May 2, 2013	Pine Bluff Business Expo	Lighting Demo, APS Demo, Program (s) training
58	May 9, 2013	SUCCESS Program - Energy Efficiency	Gave 75 minute presentations to members of SUCCESS program, providing lighting demo, APS demo, and program training for all residential programs
59	May 17, 2013	U of A Presentation - Environmental Communication Class	Discussed stakeholder relationships related to EE programs, how regulatory bodies and utility companies work together to administer EE programs, EE programs available in Arkansas, messaging strategies used on environmental communication efforts related to EE, and the communication process associated with EE.
60	June 6, 2013	Fourth Annual Small City Economic Leadership Empowerment Summit at UCA	Lighting Demo, APS Demo, Program (s) training
61	June 19, 2013	Arkansas Municipal League Annual Conference	Arkansas Municipal League Annual Conference
62	June 19, 2013	AEE Meeting	Tankless HW Heaters
63	June 20, 2013	Arkansas Municipal League Annual Conference (Energy Efficiency Program Presentation)	Arkansas Municipal League Annual Conference
64	June 28, 2013	Energy Efficiency Finance Forum	Finance
65	July 10, 2013	South Arkansas Women's Network Luncheon	Discussion of all Entergy Programs, including residential and commercial, Lighting and APS demo

66	July 23, 2013	Program Introduction	Presentation of Programs to Mt.Home plant mgrs.
67	July 30, 2013	White County Business Expo	Lighting Demo, APS Demo, Program (s) training
68	July 31, 2013	AR Association of Education Administrators (AAEA) meeting	Lighting Demo, APS Demo, Program (s) training
69	August 13, 2013	Arkansas Manufactures Assc.	Energy Conservation discussion
70	August 13, 2013	AMS Training	Small Business Training
71	September 11 - 12, 2013	Residential Money Savings Opportunities presented at the Low Income Advocates Leadership & Community Development Conference with Jeremy Champlin	Presented on all residential programs
72	September 12, 2013	Small Business Program Presentation (Funeral Home Directors)	Small Business Program Presentation
73	October 16, 2013	Show Me the Money Panel at Sustainable Communities Leadership Summit	Discussed residential and commercial money savings opportunities to attendees

3.3 Marketing

See Appendix D.

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Appendix A: Cadmus Report

Appendix D: Marketing Collateral

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Entergy Energy-Efficiency Portfolio Evaluation Report 2013 Program Year

Docket No. 07-082-TF
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CADMUS

Prepared by:

Arkansas Joint Utilities Evaluation Team

Cadmus

NMR Group

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Glossary of Acronyms

Acronym	Term
acfm	Average cubic feet of airflow
ADFA	Arkansas Development Finance Authority
AES	Agricultural Energy Solutions
AIC	Akaike's Information Criteria
AILC	Agriculture Irrigation Load Control
AOH	Annual operating hours
APS	Advanced power strip
APSC	Arkansas Public Service Commission
AVEC	Arkansas Valley Electric Cooperative
B/C	Benefit/cost
C&EE Rules	Rules for Conservation and Energy Efficiency Programs
C&I	Commercial and industrial
C&I Custom	Commercial and Industrial Custom Solutions
CAC	Central air conditioner
CCT	Correlated color temperature
CDD	Cooling degree day
CF	Coincidence factor
CFL	Compact fluorescent light bulbs
CSA	Conditional savings analysis
DCU	Digital control unit
DIY	Do-It-Yourself
EAI	Entergy Arkansas, Inc.
ECM	Electronically commutated motor
EER	Energy Efficiency Ratio
EFLH	Equivalent full load hour
EISA	Energy Independence and Security Act of 2007
EM&V	Evaluation, measurement, and verification
ESCOs	Energy service companies
GIS	Geographic information system
gpm	Gallons per minute
HBA	Home builders associations
HDD	heating degree day
HEC	Home Energy Consultant
HERS	Home Energy Rating System
HES	Home Energy Solutions
HOU	Hours-of-use
HSPF	Heating seasonal performance factor
HVAC	Heating, ventilation, and air conditioning
IECC	International Energy Conservation Code

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Acronym	Term
IEF	Interactive effects factor
IEM	Independent Evaluation Monitor
IRC	International Residential Code
ISR	In-service rate
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light emitting diode
LPD	Lighting power density
M&V	Measurement and verification
MW	Megawatt
MWh	Megawatt-hour
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NTG	Net-to-gross
OEM	Original equipment manufacturer
PAC	Program Administrator Cost
PC	personal computer
PCT	Participant Cost Test
POP	Point-of-purchase
POSTNAC	Post-installation weather-normalized
PRENAC	Pre-installation weather-normalized
PSO	Public Service Company of Oklahoma
PST	Predictive Savings Tool
QA	Quality assurance
QC	Quality control
RECS	Residential Energy Consumption Survey
Res DLC	Residential Direct Load Control
ROI	Return-on-investment
SEER	Seasonal Energy Efficiency Ratio
SKU	Stock keeping unit
SWEPCO	Southwestern Electric Power Company
TMY3	Typical month year
TRC	Total Resources Cost
TRM	Technical Reference Manual
UDRH	User Defined Reference Home
USDA	United States Department of Agriculture

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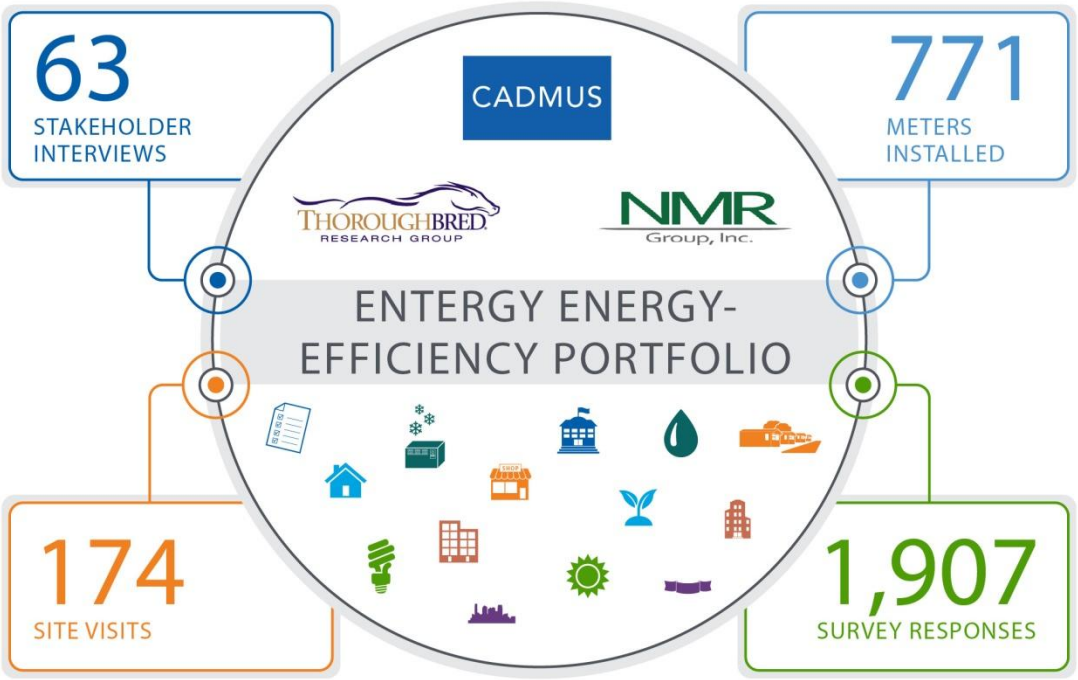
Executive Summary

In compliance with Arkansas Public Service Commission (APSC) Rules for Conservation and Energy Efficiency Programs (C&EE Rules), Entergy Arkansas, Inc. (EAI) offers a portfolio of 14 energy-efficiency, conservation, and peak-load reduction programs designed for every customer class. EAI contracted with Cadmus to evaluate its 2011 to 2014 programs, and Cadmus worked with two partners (NMR Group and Thoroughbred Research Group, together referred to as the Evaluation Team). This executive summary presents key findings from the Team's evaluation of each program during the portfolio's third year of operations in 2013.

Overview



Portfolio-Level Highlights

- In 2013, EAI achieved **129%** of its plan-based savings goal, achieving **203,987 MWh.**
- EAI reduced overall demand on the electrical grid by **62.52 MW.**
- EAI's overall portfolio surpassed participation goals by **75%,** with three programs largely driving this achievement.
- Overall, EAI achieved its portfolio energy-savings goals while spending **97%** its portfolio budget.

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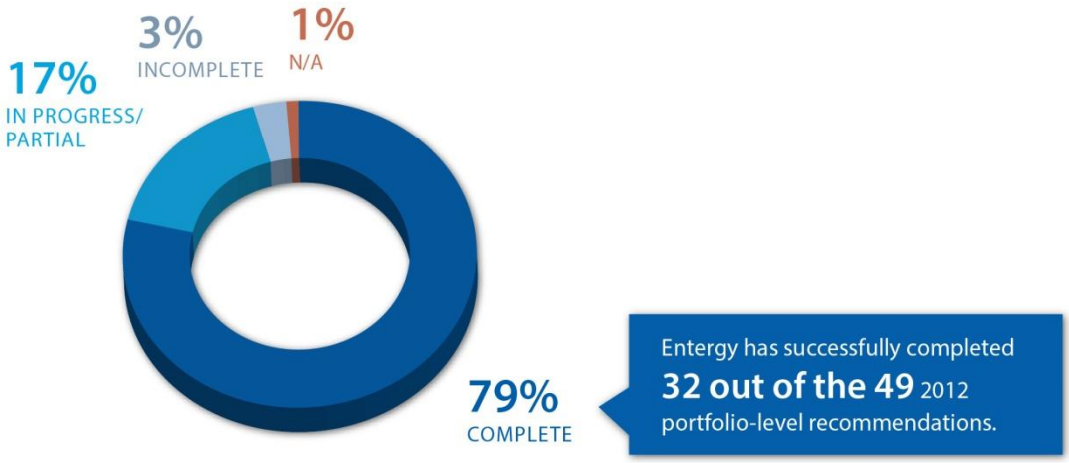
STATUS OF 2012 RECOMMENDATIONS

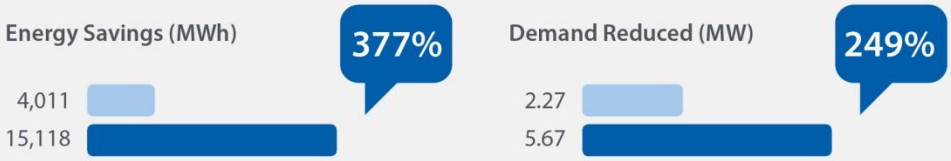
Entergy has completed or is in the process of completing **96%** of the total 2012 recommendations. These comprise recommendations at the portfolio and the program level.



Program-Level Highlights

KEY Goal Evaluated % Achieved

HOME ENERGY SOLUTIONS PROGRAM



- The one visit delivery approach created a competitive market among trade allies.
- HES participants are still somewhat unaware of program coupons.

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ENERGY STAR® NEW HOMES PROGRAM

Energy Savings (MWh) — 5%

1,084
59

Demand Reduced (MW) — 6%

0.33
0.02

- Although the New Homes Program did not achieve its 2013 goals, the program captured the majority of ENERGY STAR homes built statewide.
- Residential new construction in EAI's territory is not sufficient to support program goals.

RESIDENTIAL LIGHTING AND APPLIANCES PROGRAM

Energy Savings (MWh) — 124%

25,818
32,032

Demand Reduced (MW) — 181%

3.43
6.20

- The Lighting and Appliances Program exceeded program goals, but remained heavily dependent on CFLs.
- Leakage continues to be an issue, with approximately 32.6% of program bulbs being installed outside EAI's territory in 2013.

COOLSAVER PROGRAM

Energy Savings (MWh) — 299%

4,150
12,390

Demand Reduced (MW) — 282%

1.80
5.07

- CoolSaver's rigorous protocols have ensured that contractors perform high quality tune ups that improve HVAC system efficiency.
- EAI's program planning assumptions under-estimate measure savings.

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SMALL BUSINESS PROGRAM

Energy Savings (MWh) — 467%

1,810
8,449

Demand Reduced (MW) — 266%

0.61
1.61

- The program exceeded its energy savings and demand reduction goals by wide margins.
- The trade ally coordinator improved relationships with trade allies and enhanced recruiting efforts.

COMMERICAL AND INDUSTRIAL PRESCRIPTIVE PROGRAM

Energy Savings (MWh) — 55%

75,569
41,738

Demand Reduced (MW) — 37%

17.67
6.47

- Adjustments to the incentive strategy may have helped funnel potential C&I participants to the C&I Custom Program.
- Trade allies were satisfied with their participation in the program, but experienced various challenges.

COMMERICAL AND INDUSTRIAL CUSTOM SOLUTIONS PROGRAM

Energy Savings (MWh) — 204%

31,056
63,288

Demand Reduced (MW) — 136%

5.18
7.04

- A wider range of measures were installed in 2013 than in 2012.
- M&V was not sufficient to evaluate some projects with a high level of certainty.

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CITYSMART PROGRAM

Energy Savings (MWh) — 167%

10,352
17,237

Demand Reduced (MW) — 127%

1.38
1.75

- Public procurement policies deterred some trade allies from being as active in the CitySmart Program.
- A wider range of measures were installed in 2013 than in 2012.

AGRICULTURAL ENERGY SOLUTIONS PROGRAM

Energy Savings (MWh) — 161%

1,304
2,104

Demand Reduced (MW) — 74%

0.39
0.29

- Custom LED projects help AES achieve its savings goals, despite low, yet improved, participation in 2013.
- Tailoring measures to the farm sector created compelling new opportunities for customers to participate and helped diversify measure uptake.

RESIDENTIAL DIRECT LOAD CONTROL PROGRAM

Demand Reduced (MW) — 251%

5.21
13.06

- The difference in savings achieved by each of the two cycling groups (50% and 75%) is not as large as expected and may not align appropriately with the current incentive tiers.
- The website content developed for 2013 helped visitors understand what to expect from the Res DLC Program.

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AGRICULTURAL IRRIGATION LOAD CONTROL PROGRAM

Demand Reduced (MW)

7.99	
8.22	103%

- AILC Program participants have not yet fully embraced the online well control interface.
- Atypical weather in 2013 limited the effectiveness of an otherwise robust and well-executed marketing effort.

ENERGY SOLUTIONS FOR MANUFACTURED HOMES PROGRAM

Energy Savings (MWh)

641	
680	106%

Demand Reduced (MW)

0.50	
0.08	16%

- The Manufactured Homes Program was more accessible to customers throughout EAI's service territory due to expanded coverage in 2013.
- Adding a fluent Spanish speaking staff member to the implementation team increased program engagement with the Spanish speaking population.

ENERGY SOLUTIONS FOR MULTIFAMILY PROGRAM

Energy Savings (MWh)

455	
774	170%

Demand Reduced (MW)

0.11	
0.10	93%

- Staff struggled to identify additional cost-effective and non-competing measures to offer in 2013.
- Multifamily Program coverage improved in geographic areas throughout the state.

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RESIDENTIAL SOLUTIONS REWARD PROGRAM

Energy Savings (MWh) 161%

6,328

10,177

Demand Reduced (MW) 319%

2.17

6.92

- The 2013 online portal redesign provided an inviting customer entry point and encouraged participants to actively engage in the Rewards Program online.
- Active participants were more aware of EAI's programs and took more energy-saving actions in their homes.

Summary of 2013 Recommendations

PORTFOLIO

- Update TRM parameter values.
- Update tracking procedures to ensure that complete and accurate data are collected as necessary for program evaluation.
- Develop ways to enhance trade ally network.
- Require participating nonresidential trade allies to attend yearly program updates training.
- Investigate primary cause of nonresidential trade ally drop-out rate.

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ENERGY STAR® NEW HOMES PROGRAM

- Revisit the program design and incentive levels to attract new builders.

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COOLSAVER PROGRAM

- Review the dual-circuit system incentive for the next program cycle.
- In the next program cycle, revise the participation targets to reflect actual savings per project and track participation by market segment.
- Collect additional qualitative data and perform M&V in 2014.

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COMMERICAL AND INDUSTRIAL CUSTOM SOLUTIONS PROGRAM

- Adjust the qualifications for compressed air leak repairs.
- Provide more quality control to ensure effective commissioning and system operation.
- Conduct metering for two weeks.
- Use M&V data appropriately.

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RESIDENTIAL DIRECT LOAD CONTROL PROGRAM

- Review the efficacy of the two-tiered incentive structure to determine if each tier's contribution to savings is proportionally aligned with program design intentions.

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ENERGY SOLUTIONS FOR MANUFACTURED HOMES PROGRAM

- Structure QA/QC site visits to collect installed measure verification data.

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ENERGY SOLUTIONS FOR MULTIFAMILY PROGRAM

- Structure QA/QC site visits to collect installed measure verification data.

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RESIDENTIAL SOLUTIONS REWARD PROGRAM

- Track customers that have moved or become ineligible and replace a proportional amount across treatment and control groups to compensate this attrition.
- Consider moving forward with formalizing the pilot as a program.

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HOME ENERGY SOLUTIONS PROGRAM
RESIDENTIAL LIGHTING AND APPLIANCES PROGRAM
SMALL BUSINESS PROGRAM
COMMERCIAL AND INDUSTRIAL PRESCRIPTIVE PROGRAM
CITYSMART PROGRAM
AGRICULTURAL ENERGY SOLUTIONS PROGRAM
AGRICULTURAL IRRIGATION LOAD CONTROL PROGRAM

- No recommendations at this time.

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Introduction

In June 2011, the APSC approved EAI's three-year *Energy Efficiency Plan*, filed in Docket No. 07-082-TF. EAI's Plan includes a cost-effective portfolio of energy-efficiency, conservation, and peak load reduction programs designed to facilitate reductions in electricity and peak demand in every customer class. EAI designed its portfolio to achieve the energy reduction targets adopted by the APSC in Order No. 17 in Docket No. 08-144-U.

In accordance with APSC rules, EAI engaged Cadmus to conduct an evaluation, measurement, and verification (EM&V) of its portfolio. Cadmus worked with two partners (together referred to as the Evaluation Team), who were responsible for the following:

- NMR Group provided net-to-gross (NTG) analysis
- Thoroughbred Research Group conducted customer and nonparticipant surveys

This report presents the results of the Evaluation Team's EM&V of EAI's 2013 programs.[1]

Portfolio Overview

EAI's energy-efficiency portfolio includes 14 programs offering a comprehensive range of energy-efficiency, demand reduction, and educational options for every customer sector. EAI designed its programs to provide customers with easy program entry points, flexible options for saving energy, and ongoing support for participants who want to pursue deeper energy savings. The portfolio's objectives include:

- Achieving or exceeding annual energy-efficiency targets based on 0.75% of EAI's 2010 retail sales in 2013, as set forth by the APSC. This amounted to 158,119 MWh[2] in 2013 based on EAI's planning target, or 139,028 MWh when adjusted for self-direct customers.
- Offering significant energy-savings opportunities for all customer classes and market segments, through:
  - Varied programs targeting energy efficiency, demand reduction, and conservation;
  - Options at a technology or whole-building level;
  - A wide range of incentives for installing individual technologies or building upgrades, conserving energy through behavioral modification, maintaining equipment, and/or obtaining energy-efficient educational services (e.g., audits);
  - Solutions for existing and new construction; and

[1] The Team did not evaluate two statewide programs included in the EAI portfolio: the Arkansas Weatherization Program and Energy Efficiency Arkansas.

[2] This is EAI's 2013 weather-adjusted target and does not reflect an adjustment to savings based on industrial customers opting to self-direct. EAI will file its revised portfolio level target with the APSC in its 2013 Annual Report.

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  - Robust contractor and vendor networks to support program delivery.
- Achieving broad ratepayer benefits as outlined in the APSC C&EE Rules. These benefits include: generating energy, demand, and energy cost savings; improving reliability and energy security; generating environmental and economic benefits; and implementing programs efficiently.
- Achieving comprehensiveness as described in the APSC's *Comprehensiveness Checklist*.

Table 1 shows each program included in EAI's portfolio and the customer sectors it targets.

Table 1. EAI Programs by Sector

Program	Residential	Small Business	Commercial and Industrial	Municipal Institutional	Agricultural
Home Energy Solutions (HES)	●				
ENERGY STAR® New Homes (New Homes)	●				
Residential Lighting and Appliances (Lighting and Appliances)	●				
CoolSaver	●	●	●		
Small Business		●			
Commercial and Industrial (C&I) Prescriptive		●	●		
C&I Custom Solutions (C&I Custom)			●		
CitySmart				●	
Agricultural Energy Solutions (AES)					●
Residential Direct Load Control (Res DLC)	●				
Agricultural Irrigation Load Control (AILC)					●
Energy Solutions for Manufactured Homes (Manufactured Homes)	●				
Energy Solutions for Multifamily (Multifamily)	●				
Residential Solutions Rewards (Rewards)	●				

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Evaluation Objectives

In accordance with the Arkansas Technical Reference Manual (TRM) Version 3.0,[3] the Evaluation Team designed the 2013 portfolio evaluation to: 1) quantify energy and demand savings resulting from EAI's 2013 program portfolio, 2) understand why certain program effects occurred, and 3) identify ways to improve and refine current and future programs.

The Team had the following objectives for the2013 impact evaluation:

- Verify that program tracking data support total claimed savings
- Review the current database tracking methodology against the recommended formats in *PROTOCOL A: Program Tracking and Database Development*, as defined in the Arkansas TRM
- Verify correct use of the Arkansas TRM values
- Estimate 2013 gross energy and demand impacts at the measure and program levels
- Estimate net impacts at a program level
- Identify key issues and areas of focus for subsequent evaluations and TRM updates

The Team's 2013 process evaluation objectives were to:

- Document the programs' 2013 evolution, processes, and key success factors and challenges
- Review and assess new or significantly changed program materials to verify that they contain elements critical for program success
- Track EAI's progress incorporating recommendations from the 2012 evaluation
- Identify significant gaps, achievements, trends, and areas where improvements are needed
- Provide recommendations to help streamline program delivery and operations, improve customer satisfaction, enhance participation and energy savings, and achieve varied program objectives

Summary of Evaluation Activities

To facilitate a thorough evaluation, the Team conducted a wide range of primary research and data collection activities, including nearly 1,000 participant surveys and 174 site visits. Table 2 summarizes our research activities by program, including the achieved sample for each activity.

[3] Frontier Associates, LLC. Arkansas Technical Reference Manual Version 3.0, Volume 2: Deemed Savings. Filed with the APSC August 30, 2013. p.121 - 138.

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Table 2. Data Collection Activities and Sample Sizes

Program	Utility Staff Interviews	Implementer Interviews	Trade Ally Interviews	Participant Surveys	Nonparticipant Surveys	Site Visits	Meters Installed
HES	2	1	5	75			
New Homes	2	2		6			
Lighting and Appliances	1	1			532*	63	485
CoolSaver	1	1		130	70	42	30
Small Business	1	1		70		17	97
C&I Prescriptive	2	2	20	85		22	146
C&I Custom	2	3		11	281*	29	
CitySmart	1	1		29		1	13
AES	2	2		6			
Res DLC	1	1		71			
AILC	1	1		50	76		
Manufactured Homes	1	1		32			
Multifamily	1	1		103			
Rewards	1	1		280			
Total	19	19	25	948	146	174	771

*EAI customers who participated in combined surveys with customers of the Southwestern Electric Power Company (SWEPCO).

The Evaluation Team used the data we collected from these activities to facilitate a qualitative process evaluation and analysis of portfolio comprehensiveness, as well as to conduct a range of impact evaluation activities to calculate program savings. Table 3 summarizes our analysis activities by program.

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Table 3. Energy Savings Analysis Activities

Program	Impact Analysis									Net-to-Gross Analysis		
	Engineering/Desk Review	Deemed Savings Calculation	Interactive Effects Modeling	Leakage Analysis	Billing Analysis*	HERS Modeling	Compressor Mapping	Lighting Hours-of-Use Analysis	Baseline Savings Estimation	Freeridership and Spillover Calculation	Price Response Modeling	Experimental Design
HES	●	●			●					●		
New Homes	●					●				●		
Lighting and Appliances	●	●	●	●				●			●	
CoolSaver	●	●					●			●		
Small Business	●	●						●		●		
C&I Prescriptive	●	●						●		●		
C&I Custom	●									●		
CitySmart	●	●						●		●		
AES	●	●								●		
Res DLC**	●								●			
AILC**	●								●			
Manufactured Homes	●	●								●		
Multifamily	●	●								●		
Rewards	●				●							●

* The Evaluation Team used billing analyses for both the HES and Rewards programs. To eliminate double counted savings, the Team removed savings from Rewards participants that also participated in other EAI programs.

** The Evaluation assumes a stipulated NTG of 1.0 for all demand response programs; therefore the Team did not conduct NTG analysis for the AILC and Res DLC programs.

The Evaluation Methodology section provides detailed descriptions of the Evaluation Team's approach to conducting these data collection and analysis activities.

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Portfolio Conclusions and Recommendations

This section presents the Evaluation Team's findings and conclusions at a portfolio level. We drew conclusions based on our impact and process evaluation research and analysis across all programs, where common findings revealed general trends and cumulative results that represent opportunities for operational and structural improvements at a portfolio level.

Under each heading below, we present a concluding statement, followed by findings that support the concluding statement. We provide portfolio-level recommendations and strategic suggestions to address specific areas for improvement in the Portfolio Level Recommendations section of this report.

Portfolio Performance

In 2013, EAI's portfolio exceeded its energy-savings and demand-reduction targets.

Table 4 summarizes EAI's energy-savings and demand-reduction targets and results at the generator on an evaluated net basis. Both the goals and achieved savings reflect appropriate adjustments to energy and demand to account for line loss. At a portfolio level, EAI exceeded its filed net energy-savings goal by 29% and its goal adjusted for approved opt-out customers by 46%.[4] EAI achieved 128% of its 2013 peak demand-reduction goal.

[4] The APCS C&EE Rules include a provision allowing Arkansas nonresidential customers to request approval from the APSC to opt-out of participating in utility energy-efficiency programs and instead participate in a self-directed energy-efficiency option.

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Table 4. EAI 2012 Portfolio Targets vs. Actual by Program

Program	Energy Savings (MWh)			Net Demand Reduced (MW)		
	Goal	Achieved	Percent	Goal	Achieved	Percent
HES	4,011	15,118	377%	2.27	5.67	250%
New Homes	1,084	59	5%	0.33	0.02	6%
Lighting and Appliances	25,818	32,032	124%	3.43	6.20	181%
CoolSaver	4,150	12,390	299%	1.80	5.07	282%
Small Business	1,810	8,449	467%	0.61	1.62	266%
C&I Prescriptive	75,569	41,738	55%	17.67	6.47	37%
C&I Custom	31,056	63,228	204%	5.18	7.04	136%
CitySmart	10,352	17,237	167%	1.38	1.75	127%
AES	1,304	2,104	161%	0.39	0.29	74%
Res DLC	NA	NA	NA	5.21	13.06	251%
AILC	NA	NA	NA	7.99	8.22	103%
Manufactured Homes	641	680	106%	0.50	0.09	17%
Multifamily	455	774	170%	0.11	0.10	93%
Rewards	6,328	10,177	161%	2.17	6.92	319%
Total*	158,119	203,987	129%	49.03	62.52	128%
Total Adjusted for Self-Direct**	139,622	203,987	146%	N/A	N/A	N/A

* The portfolio level target before self-direct adjustment reflects normalization for 2013 weather conditions; however, program level targets were not adjusted. EAI will file its revised portfolio level target with the APSC in its 2013 Annual Report. As a result, portfolio-level savings target does not accurately sum program level goals.
** This total reflect EAI's net energy-savings targets, adjusted to account for industrial customers opting to self-direct in 2013.

Only two EAI programs did not achieve their energy savings targets; and while five programs fell short of their demand reduction targets, both of EAI's load control programs were able to achieve their demand goals.

As shown in Figure 1, three programs produced more than two-thirds (68%) of the energy savings in EAI's portfolio (C&I Custom 31%; C&I Prescriptive 21%; and Lighting and Appliances 16%). Res DLC produced 21% of the demand reductions in the 2013 portfolio (Figure 2).

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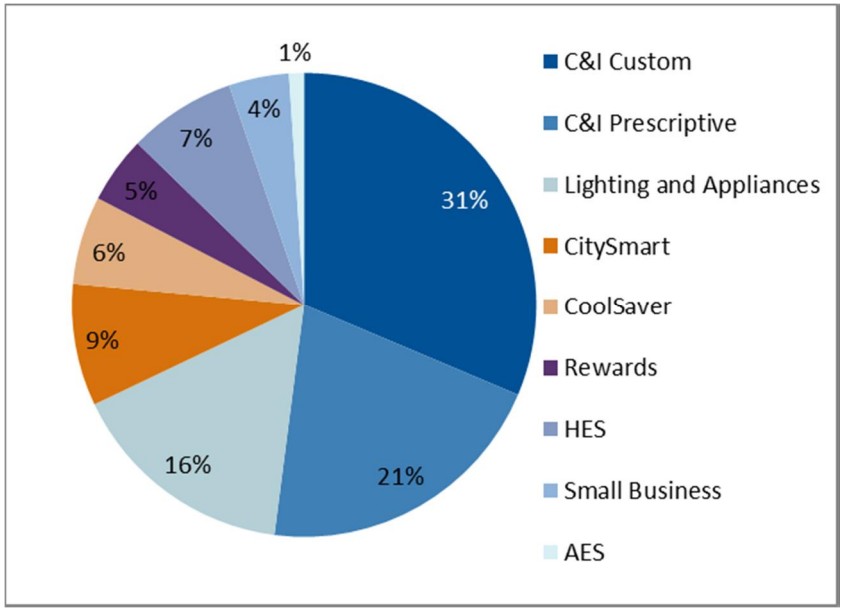
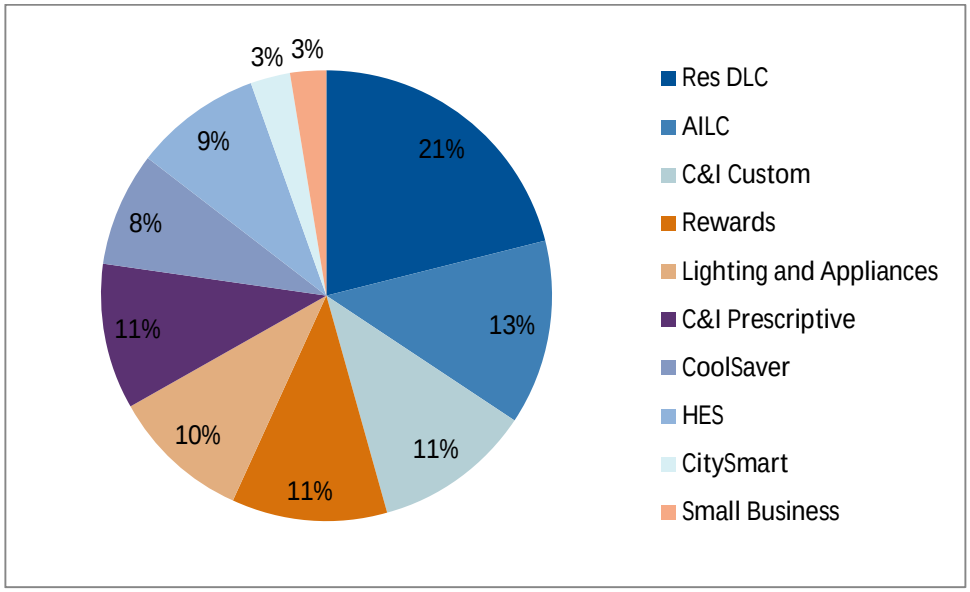
Figure 1. EAI Energy-Savings Distribution by Program



Note: Figure does not include programs that contributed less than 1% to portfolio savings.

Figure 2. EAI Demand-Reduction Distribution by Program



Note: Figure does not include programs that contributed less than 1% to portfolio savings.

In general, the Evaluation Team found that EAI's programs were well designed and implemented in accordance with industry standards, and its marketing approach leverages diverse outreach channels and deployment tactics.

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Four programs performed exceptionally well, exceeding EAI's net savings goals by more than 100% (HES, CoolSaver, Small Business, and C&I Custom). In addition, five EAI programs exceeded their goal by at least 24% (Lighting and Appliances, CitySmart, Multifamily, Rewards, and AES). Only two programs (C&I Prescriptive and New Homes) did not achieve their expected energy-savings goals.

Several programs also surpassed their demand-reduction target by significant margins. The Small Business, CoolSaver, Res DLC, and Rewards programs exceeded EAI's demand-reduction goals by more than 100%. However, of EAI's 14 programs, five did not achieve their demand-reduction goals (New Homes, C&I Prescriptive, AES, Manufactured Homes, and Multifamily).

In 2013, four programs provided significant savings benefits compared to spending.

Overall, EAI achieved its portfolio energy-savings goals while spending 97% its portfolio budget. Table 5 shows a comparison of spending against filed budgets by program.

Table 5. Program Budgets vs. Spending

Program	Budget	Spending	Percent of Budget Spent in 2013
HES	$4,329,741	$7,751,972	84%
New Homes	$531,230	$380,706	72%
Lighting and Appliances	$4,447,447	$2,868,407	64%
CoolSaver	$2,406,228	$2,709,599	113%
Small Business	$1,676,738	$1,590,045	95%
C&I Prescriptive	$12,956,146	$9,388,423	72%
C&I Custom	$11,332,721	$13,167,939	116%
CitySmart	$2,901,764	$2,587,459	89%
AES	$641,732	$442,272	69%
Res DLC	$3,417,117	$3,221,531	94%
AILC	$4,130,531	$2,779,216	67%
Manufactured Homes	$836,228	$857,328	103%
Multifamily	$426,021	$567,372	133%
Rewards	$1,487,462	$1,510,930	102%
Total	$51,521,106	$49,823,198	97%

Portfolio budget does not include AWP or EEA as they are not part of this evaluation.

At a program level, three programs (CoolSaver, Res DLC, and Small Business) exceeded their savings targets by more than 150% while spending was nearly in line with their budgets, and four other programs (Lighting and Appliances, CitySmart, AES and AILC) achieved goals while underspending their budgets by more than 10%, indicating that EAI captured considerable energy-savings value from these programs. In only two programs, New Homes and C&I Prescriptive, program savings as a percentage of goal was lower than EAI's spending as a percentage of budget. Figure 3 summarizes program spending and energy savings compared to budgets and goals by program.

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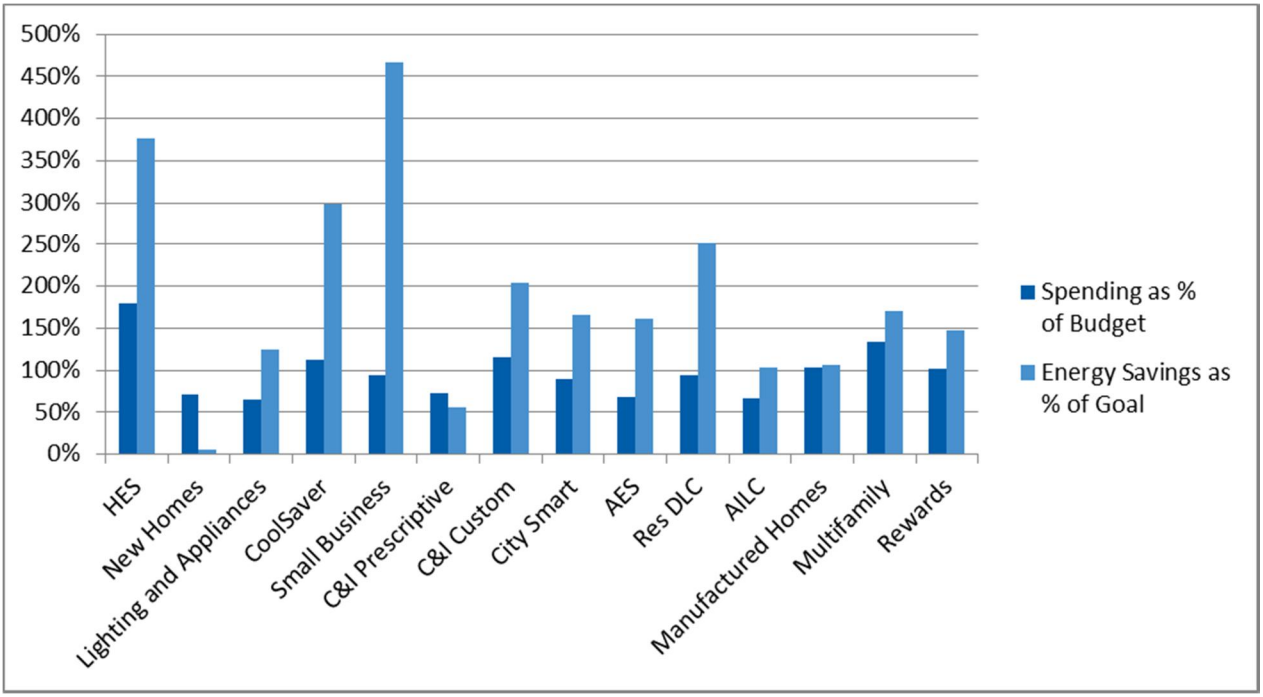
Figure 3. Program Spending vs. Goal Achievement*



* The displayed goals for RES DLC and AILC, which are demand-reduction programs, reflect demand rather than energy savings percent of goal.

EAI met its portfolio participation goals, but a few programs struggled to attract customers.

EAI's overall portfolio surpassed participation goals by 75% (Table 6). Although EAI exceeded its portfolio-level participation target, only three programs achieved their participation goals. Two (Lighting and Appliances and HES) exceed participation targets by 55% and 63%, respectively. Although the Rewards program exceeded its participation goal by 285%, this number reflects the maximum number of customers who received any type of Treatment through the program. The number of customers who took verified action to reduce energy use is unknown.[5] In the Lighting and Appliances Program, excess participation over the goal equated to nearly half a million more program measures being distributed than EAI's planning estimates assumed, which also helped drive goal achievement at the portfolio level. , Participation results are summarized Table 6.

[5] The definition of a Rewards Program participant in EAI's planning assumptions is "customer." Because the Rewards Program engages with customers in many different ways, the Evaluation Team reported the total number of customers who received any Treatment type plus those who engaged in the program online without having received any Treatment.

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Table 6. Participation Goal v. Actual

Program	Participation		
	Goal	Actual	Percent of Goal
HES (customers)	3,600	5,883	163%
New Homes (homes)	450	24	5%
Lighting and Appliances (measures)	905,778	1,404,805	155%
CoolSaver (tune-ups)	10,061	8,751	87%
Small Business (customers)	1,325	817	62%
C&I Prescriptive (customers)	1,030	588	57%
C&I Custom (customers)	398	69	17%
CitySmart (customers)	159	101	64%
AES (customers)	150	22	15%
Res DLC (customers)	15,003	11,935	80%
AILC (customers)	400	198	50%
Manufactured Homes (customers)	1,819	1,015	56%
Multifamily (apartment complexes)	408	92	23%
Rewards (customers)	100,000	385,268	175%
Total	1,040,581	1,819,568	175%

Of its 14 programs, 11 did not achieve participation goals and four programs achieved less than 50% of their participation goals. As documented in the 2012 *Energy-Efficiency Portfolio Evaluation Report* (specifically the Portfolio-Level Conclusions, Findings, and Recommendations section) and in this report, EAI faces both common and unique challenges to engaging customers. These include the following.

- Under the provisions of the C&EE Rules, nonresidential electric customers may opt-out of paying into utility-provided energy-efficiency programs when they participate in a Self-Directed Energy Efficiency Option. In 2013, the APSC approved large C&I customers representing approximately 12% (18,497 MWh) of EAI's 2013 goal, to self-direct.
- Leakage is a concern throughout Arkansas, where municipal and cooperative utilities that do not offer APSC-mandated demand-side management programs are interspersed with pockets of EAI territory. This is discussed in greater detail in other sections of this report.
- It is difficult to navigate commercial customers' complex decision-making process, including identifying key decision makers, making the case for investment in energy efficiency, and overcoming their suspicions that the programs are, "too good to be true."
- Much of EAI's territory is rural and includes a high proportion of low-income customers and smaller, independently owned businesses with limited access to discretionary funds for non-essential energy-efficiency investments. Rural areas also tend to have fewer trade allies serving a more dispersed customer base.
- Although program awareness is increasing, it remains relatively low among EAI customers. This is further described in later sections.

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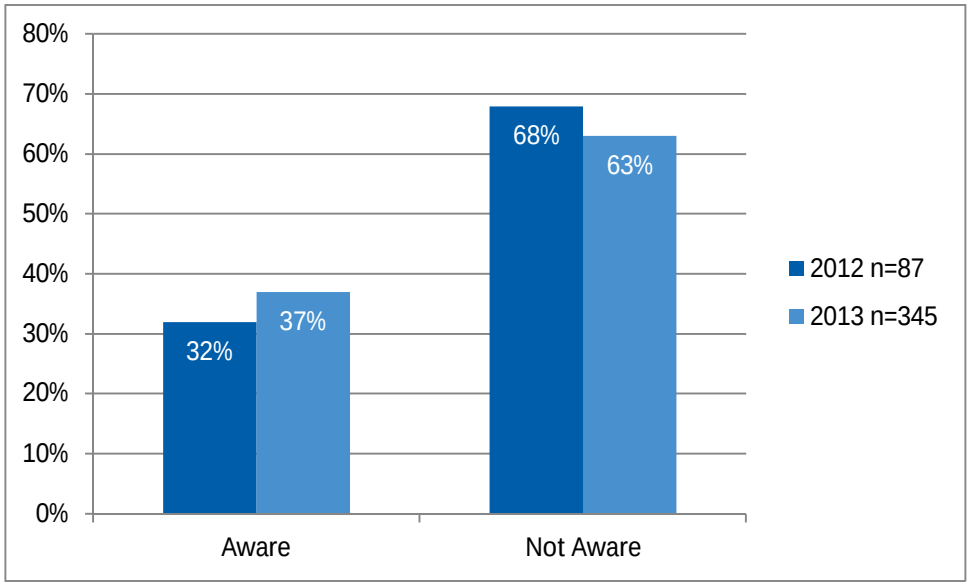
General nonresidential customer awareness of EAI's energy-efficiency programs increased; however, familiarity with specific programs has not.[6]

As shown in Figure 4, slightly more nonparticipating nonresidential customers reported being aware of EAI's energy-efficiency programs in 2013 (37%) than in 2012 (32%); however, the majority of these customers remain unaware (63% in 2013 compared to 68% in 2012).

Figure 4. Nonresidential Nonparticipant Awareness



Multiple survey questions; see Appendix A.

However, nonparticipating customer's recall of specific EAI programs was lower in 2013 than it was in 2012. More than (56%) of the nonresidential customers who reported being aware of EAI's energy-efficiency programs in general in 2013 were unable to recall a specific program name (Figure 5). This is slightly higher than results in 2012, when 44% of nonparticipants were unable to recall a specific program name.

[6] The Evaluation Team did not include a trending question for residential customers regarding program awareness or recall.

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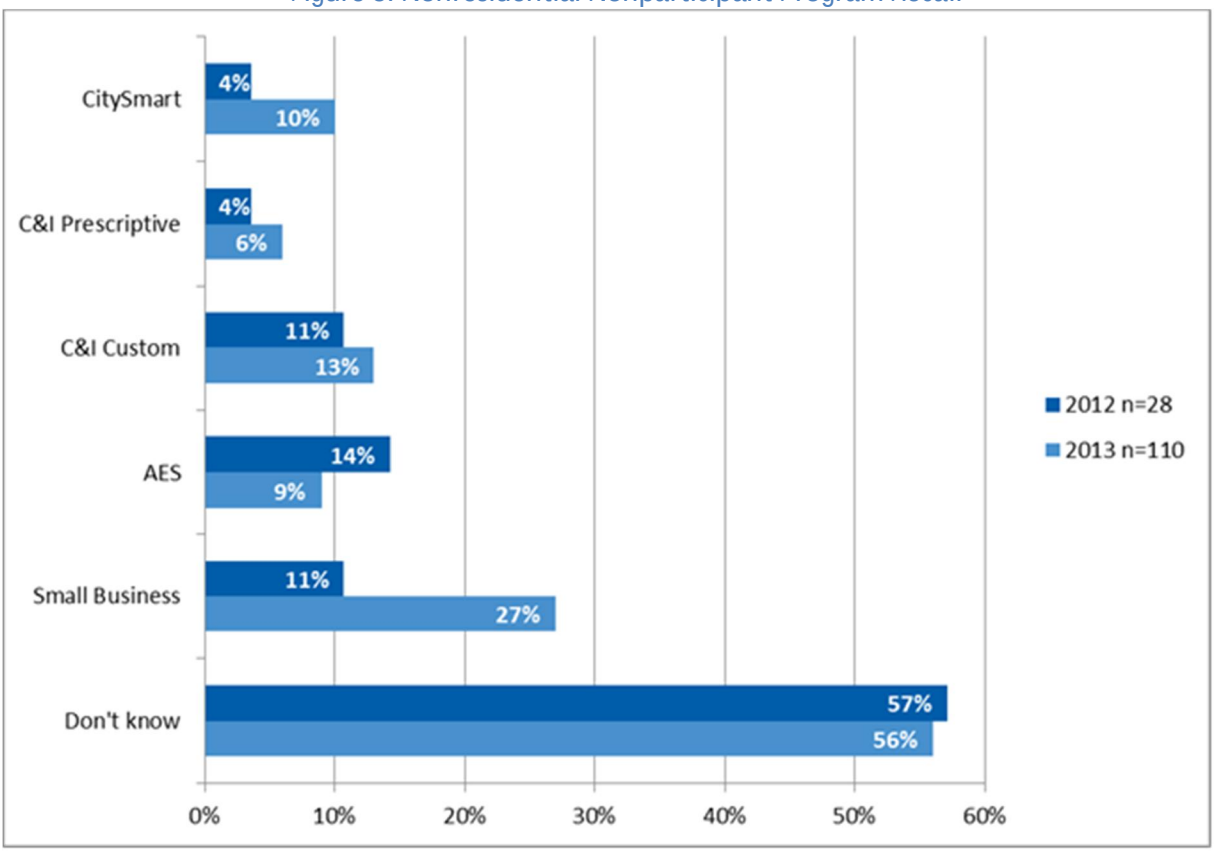
Figure 5. Nonresidential Nonparticipant Program Recall



Multiple survey questions; see appendix A.

Of those who could recall a specific program, nearly twice as many customers recalled Small Business and CitySmart in 2013 (27% and 10%, respectively) than in 2012 (17% and 6%, respectively). In addition, slightly more customers recalled C&I Custom in 2013. However, fewer customers recalled AES and C&I Prescriptive in 2013 (17% and 8%, respectively) than in 2012 (9% and 6%, respectively) and 12% more customers responded "don't know" in 2013.

EAI implemented the majority of 2012 evaluation recommendations

Following the EAI portfolio's first full year of implementation in 2012, the Evaluation Team made a significant number of recommendations covering a wide range of topics. In 2013, EAI implemented the majority of the Evaluation Team's 2012 recommendations.

Table 7 summarizes the status of all 2012 recommendations by program and at the portfolio level.[7]

[7] All recommendations listed in the 2012 evaluation report and documented by the IEM are included in this total; however, some are categorized differently.

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Table 7. Overall Status of 2012 Recommendations

Program Name	Completed*	In Progress/ Partial	Incomplete	N/A	Total
Portfolio Level	32	12	5	0	49
HES	23	0	0	0	23
New Homes	20	1	0	0	21
Lighting and Appliances	27	1	1	3	32
CoolSaver	10	3	2	2	17
Small Business	17	4	1	0	22
C&I Prescriptive	21	3	0	0	24
C&I Custom	16	3	0	0	19
CitySmart	11	7	0	2	20
AES	16	1	0	0	17
Res DLC	19	2	0	0	21
(AILC	14	3	0	0	17
Manufactured Homes	9	0	0	0	9
Multifamily	9	0	0	0	9
Rewards	18	2	0	0	20
Total	144	30	5	2	181

* The Team assigned some recommendations Completed (Considered/Rejected) status. These recommendations are included in the Completed column.

To determine the status of each recommendation, the Evaluation Team gathered input from key stakeholders, including implementation and program staff; reviewed program materials and databases; and conducted trade ally interviews and customer surveys. We then assigned each recommendation one of the following designations:

- *Completed:* EAI considered and took action to implement the recommendation.
- *Completed (Considered/Rejected):* EAI considered the recommended action, but determined that it was not in the best interest of its program or beneficial to meeting program goals.
- *In Progress/Partial:* EAI either partially implemented or is in the process of implementing the recommendation.
- *Incomplete:* The recommendation was not implemented.
- *N/A:* The recommendation was no longer applicable for the program.

Table 8 summarizes the status of 2012 portfolio level recommendations. The status column provides supporting documentation of the recommendation, but may not be exhaustive of the entire portfolio. We present similar results at a program level in each program-specific section.

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Table 8. 2013 Status of 2012 Portfolio-Level Recommendations

Recommendation	Status
Evaluate options for offering low-cost financing to customers through partnerships with national lenders or local banks through an on-bill repayment mechanism.	*Completed.* CitySmart Program staff recruited two financing contractors in 2013 (staff remain interested in exploring other options, as many municipalities or schools are not permitted to take on financing). In addition, C&I Prescriptive and C&I Custom staff added one finance-based trade ally and are actively promoting additional work from energy service companies (ESCOs).
For C&I and institutional customers, investigate engaging performance contractors by working with the Arkansas State Energy Office and the National Association of Energy Service Companies.	*Incomplete.* No documentation.
Target each sector with the types of marketing materials they look to first. For example, the surveyed AILC participants mentioned that bill inserts are the best way to spread information about this program and other agricultural program offerings, while C&I Custom Program participants mentioned that face-to-face meetings, especially with an EAI account representative, are the most effective outreach tactic for their sector.	*Completed.* C&I Custom staff leveraged direct mail and cold calls. AES staff engaged farmers through in-person meetings, phone calls, and events, as well as sending a letter to farmers and following up by phone. CitySmart staff focused on word-of-mouth and personal outreach. AILC staff sent three rounds of bill inserts and implemented online search engine and banner ads. Lighting and Appliances implementation staff increased outreach events by 110% over 2012. They also used direct mail, the program website, print ads, radio interviews, signage at retail point-of-purchase (POP) events, cooperative social media, education, and outreach.
Continue efforts to streamline the evaluation process and maintain a high level of customer service.	*Completed.* C&I Custom staff worked closely with customers to help them understand the measurement and verification (M&V) process. In addition, account managers worked with implementation staff to manage outreach and follow-up with participants; and engineering staff conducted follow-up calls and responded to technical requests, informing account managers as needed. CLEAResult hired additional CitySmart staff members to conduct customer follow-up. Res DLC program staff are committed to quarterly program meetings to keep abreast of customer needs. C&I Prescriptive and Small Business implementation staff invite utility staff to all post inspections.
The implementer should provide project files that include all relevant calculations, invoices, equipment specification sheets, and participant communications that provide clarity on the installed measures.	*In Progress/Partial.* The implementer provided reports for measures that required M&V. The implementer did not provide files on any non-M&V measures, nor did the submitted documentation include invoices,

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	equipment specifications, communications, or any other details.
The implementer should provide the final reported energy savings and demand reduction by measure for all approved projects within the first week following the close of the program year.	*In Progress/Partial.* The implementer provided final reported savings on January 14, 2014. However, the Evaluation Team and EAI had proposed a final data deliverable date of January 19. Therefore, the implementer provided final savings numbers before the scheduled deliverable date.
Provide an immediate response by email to confirm receipt of data requests as well as sending a follow-up email indicating who is responsible for data fulfillment and an approximate time frame for delivery.	*In Progress/Partial.* Not all requests were complied with.
Ensure ICF receives data requests promptly. Require ICF to confirm receipt to both EAI and the Evaluation Team.	*Completed.* ICF has been prompt in confirming receipt of the Team requests.
Conduct a data review prior to the end of the third quarter to ensure all data to date are complete and consistent. Implement data submittal deadlines and delivery protocols to reduce year-end bottlenecks.	*Completed.* EAI standardized all data in the ArchEE database, implemented in 2013.
Verify the accuracy of all savings calculations and tracking methods before the end of the program cycle to avoid having to resubmit data.	*Completed.* No recalculations were needed that we are aware of at this time.
Develop internal tracking protocols for the AILC Program. Keep all metered data for the entire peak season together and use a consistent format. Keep participating and active customer information up-to-date by maintaining it regularly.	*Completed.* AILC Program data was much more consistent in 2013. There is still an issue of keeping track of active versus opt-out customers, but this is considered a program implementation issue and not a data issue.
Ensure that historical usage data is readily available, even if archived.	*Completed.* The Evaluation Team had no issues obtaining historical usage data.
Maintain consistent data formats and content so that updating data does not require providing completely new datasets. Make measure categories and measure names consistent through the program year. Use standardized formats for customer identifying information such as account numbers, phone numbers, and ZIP codes.	*Completed.* These issues were addressed with the ArchEE database.
Review data regularly for issues such as missing customer information and savings.	*Completed.* The implementers resolved any issues found.
Ensure all program and implementation staff are trained on and periodically review EAI's data security protocols.	*Completed.* No data security issues occurred in 2013.
Do not use customer account numbers in documents that are accessed by third-party contractors. Rather, use an alternative ID system on site visit forms, project	*In Progress/Partial.* Many third-party datasets had customer account numbers in 2013, but less often than in 2012.

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savings calculators, and in tracking data to protect customers' personal information.	
Use a unique, non-account identifier number for participants that can be consistent across programs.	*Incomplete.* The Evaluation Team could not find any identifier in ArchEE that is unique for each customer or replaces the customer account numbers.
Provide all tracking data in consistent electronic formats.	*Completed.* The ArchEE online database was a major breakthrough for delivering data in a consistent electronic format.
Continue to prioritize exceptional customer service in customer interactions.	*Completed.* Implementation staff focused on working with key C&I Prescriptive and Small Business decision makers on each project.
Consider redesigning the prescriptive incentive to use a prescribed approach. In most jurisdictions, prescriptive programs use standardized incentives on a per-measure basis.	*Incomplete.* No documentation.
Consider combining the C&I Prescriptive and C&I Custom programs into a single offering with multiple delivery tracks available to fit with customers' individual needs.	*Completed.* EAI staff requested to combine C&I Prescriptive and C&I Custom programs into a single program in 2014.
Expand contractor outreach and recruitment to more actively seek non-lighting contractors to support project installations.	*Completed.* The C&I Prescriptive implementer recruited additional trade allies that offer services beyond lighting. In addition, the Small Business trade ally coordinator is recruiting contractors from all areas of industry specialties.
Consider adjusting the programs' designs—particularly for programs that offer on-site facility assessments and technical assistance—to ensure that the program implementer has an opportunity to evaluate comprehensive project opportunities and provide customers with independent energy-efficiency recommendations.	*Completed.* CitySmart Program staff used opportunity assessment reports to encourage implementing projects in a phased approach. In addition, staff determined that leveraging technical assistance to offer additional value to returning participants who want to complete more comprehensive projects was a more productive use of those program funds.
Develop a contractor referral bonus option whereby contractors who recommend alternative measures (i.e., measures outside their own business service) and customers then install those measures receive a bonus incentive.	*Incomplete.* No documentation.
Consider developing a formal trade ally network and expanding trade ally benefits. Use the trade ally network as a forum for program information and updates, to extend training opportunities, and to offer marketing tools and materials, technical support, and other tangible benefits to participating contractors. A trade ally network can also help trade allies develop	*In Progress/Partial.* Although few programs have formal trade ally networks, the majority have solid trade ally outreach and support. For example, EAI added account managers to the implementation team to conduct C&I Custom Program outreach and support trade allies' outreach efforts; for these efforts, the account managers used a combination of cold calling

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relationships with each other.	and mailer/phone follow-up. In addition, C&I Custom staff held meetings and trainings on an ongoing basis and informed trade allies about outside training or technology education options, as well as sales and marketing. The CitySmart trade ally coordinator conducted regular training sessions and developed a newsletter giving technical assistance and program information. C&I Prescriptive implementation staff held trade ally meetings to educate existing trade allies and to introduce new trade allies to the program. CLEAResult staff substantially revised the CoolSaver contractor training to incorporate more sales content. In addition, staff reached out directly to the marketing decision-makers at each participating firm. The New Homes Program implementer offered training to all participating builders and Home Energy Rating System (HERS) raters and followed up with training attendees via phone. The Small Business Program trade ally coordinator conducted regular training sessions and provided a newsletter giving technical assistance and program information to assist contractors in engaging customers in the program.
Solicit contractor feedback to ascertain the specific types of support they would find most useful to promote the programs and sell eligible measures to their customers.	*In Progress/Partial.* C&I Custom staff assigned a coordinator to lead trade ally interactions and held regular meetings and trainings for new and returning trade allies. The C&I Prescriptive implementation staff held trade ally meetings and the dedicated trade ally coordinator provided avenues for trade ally feedback on both personnel performance and project status. CLEAResult staff met individually with all CoolSaver contractors to present new materials and ask which materials they preferred. HES staff conducted a post-training survey with trade allies to gather feedback. Small Business implementation staff gathered trade allies' feedback through trade ally summits and ongoing communication.
Host annual or semi-annual trade ally networking and training events to present program information and discuss marketing and delivery strategies. Providing a sense of involvement in identifying program success strategies can further engage contractors in the programs.	*Completed.* C&I Custom staff held trade ally training sessions to provide updates on program participation and to encourage trade allies to use case studies in their marketing/sales efforts. AES staff presented program information through breakfast and lunch events hosted by many different trade allies. In addition, staff hosted two coffee and donut events that garnered respectable

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	attendance. The CitySmart trade ally coordinator conducted frequent training to educate and gather feedback from trade allies. Staff are also developing new collateral in response to contractor requests. The New Homes Program implementer held builder meetings at participating HERS raters' offices and continued to offer in-person meetings to all builders.
Develop a website that provides tools and information specifically for a participating trade allies. Provide access to program information and application forms, downloadable fact sheets and brochures, co-brandable marketing materials, a trade ally newsletter, etc.	*In Progress/Partial.* While there is no documentation regarding a trade ally-specific portal or website, several of the programs ARE making efforts to provide marketing collateral and support to trade allies as recommended. For example, AES staff provided trade allies with EAI truck magnets and EAI-branded fact sheets and staff sent direct mail on EAI letterhead to potential customers. Implementation staff trained C&I Prescriptive trade allies to use marketing materials, ad templates, program badges, etc. HES Program staff provided co-branded materials to trade allies and CLEAResult staff provided CoolSaver marketing materials to participating contractors.
Continue recruiting trade allies for programs that did not have enough personnel to support for the 2012 activities or where the program goals will increase in the future and additional trade allies will be needed to support these program efforts.	*In Progress/Partial.* CLEAResult staff held face-to-face meetings with senior staff at each CoolSaver contractor's office and was able to increase CoolSaver contractor participation within the existing budget. The New Homes Program implementer continued to reach out to builders and HERS raters through in-person meetings and telephone calls. Lighting and Appliances implementation staff increased the number of participating retailers.
Promote programs through partner organizations with which the targeted sectors have established relationships.	*Completed.* AES staff developed contacts with distributors and poultry service technicians at customer sites who have long-standing relationships with farmers. Additionally, the program has worked to establish relationships through the Rice Federation, Poultry Federation, Farm Bureau, the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), University of Arkansas Extension Service, Agricultural Council of Arkansas, and equipment dealers. AILC staff worked with service men (rather than installation contractors) who work closely with the farmers to promote other EAI energy-efficiency programs.
Identify program champions from among past	*Completed.* Adding a farm-industry representative has

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participants who may be willing to share their stories with colleagues in their sector.	enabled the AES implementation team to develop messages that resonate with farmers. AILC Program staff developed and included farmer testimonials in radio spots and print literature. The Manufactured Homes Program implementer hired a fluent Spanish speaking staff member to support outreach efforts.
Use implementer staff with direct experience in that sector (e.g., farmers, builders, business owners) to help build trust and rapport with customers.	*Completed.* AES staff expanded the program marketing approach by increasing efforts to develop relationships with farmers and agricultural service technicians.
Ensure that all implementation staff identify themselves to customers with a utility/program branded identification badge and/or other identifying materials. Provide trade allies with program branded materials.	*Completed.* Program implementation staff that interact directly with customers provided branded materials and wore identification items such as name tags, business cards, and/or shirts/jackets.
Develop an outreach and follow-up strategy that is coordinated among all the commercial programs that share a trade ally network. Use the EAI account service managers and key trade allies as part of the outreach strategy to leverage limited staff resources.	*Completed.* EAI customer service managers and a contracted third party made marketing calls to customers on behalf of the AILC Program. In addition, ALIC staff trained staff at the EAI Irrigation Desk to inform customers of the program benefits and processes.
Leverage the high participant and trade ally satisfaction by developing case studies and testimonials to illustrate the programs' benefits. Ensure that case studies are available on the program websites and in other marketing materials.	*Completed.* C&I Custom staff developed case studies for multiple custom projects illustrating their energy and financial benefits. CitySmart staff portrayed the financial benefits of participation through opportunity assessment reports, case studies, benchmarking, and energy master planning sessions. C&I Prescriptive staff updated the website to include customer testimonials, and plan on including case studies. Small Business implementation staff developed a trifold brochure and case studies. AES and New Homes staff both developed case studies in 2013 and expect to use them in 2014.
Consider hosting meetings to highlight key program success stories at events for specific targeted program sectors. Alternatively, join other community group events (e.g., extension agency meetings, school board association meetings, chamber of commerce events) to showcase successful projects.	*Completed.* AES staff devoted considerable time to increasing program awareness by attending events, working with trade allies, and capitalizing on participant experiences. CitySmart staff conducted outreach efforts to the Arkansas School Board Association, local school districts, and at facility manager meetings.
Develop marketing materials targeting specific customer sectors that describe all of the available program options for those customers. Include brief case studies, testimonials, or project examples with financial information from installed projects in the same sector.	*Completed.* CitySmart staff developed case studies and a financially oriented fact sheet that explain financial options and solutions for customers. EAI and Comverge are currently developing a Res DLC customer satisfaction survey and will solicit customer testimonials. C&I Prescriptive staff encouraged trade allies to use case studies in their marketing and

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	outreach efforts, as well as to recommend projects for a case study that would assist them in developing more work. The New Homes and AES program implementers both developed case studies to be used in 2014.
Avoid using industry jargon in the marketing materials, such as measure or incentive. Make sure that the content in marketing materials reflects language a potential customer would use.	*Completed.* Implementers and program staff removed industry jargon from existing materials. The new marketing materials are free of heavy industry terminology. For example, C&I Prescriptive staff are developing new materials that provide a holistic description of the C&I programs to customers with less technical jargon.
Include information about additional incentives available to further reduce the upfront costs of energy-efficiency investments.	*Completed.* In general, marketing materials and program webpages promote additional incentives and mention other program offerings.
Use consistent language and terminology in all marketing materials. Create a messaging hierarchy for each program that details the primary and secondary messages for the program's target audience. Messaging should reflect participants' key motivators or address identified participation barriers.	*Partial/In Process.* In general, the marketing materials use consistent language, messaging, and terminology. While there is not a formal messaging hierarchy in place for each program, EAI has tailored the messaging to speak to specific program offerings and barriers as appropriate.
Define a single source of program information and identify simple and consistent ways for customers to enroll in the program, such as by calling one phone number and/or by submitting an online application.	*Completed.* Most programs use a uniform combination of phone number and website, allowing easy access online as well as an alternative for non-internet users.
Use a single, compelling call-to-action that is graphically prominent.	*Completed.* Most programs use both the program phone number as well as a program website. Some (in particular, the C&I programs) also use an implementer email address, which could potentially cause confusion.
Leverage the free direct install measures in materials for the HES, Small Business, and other programs that provide them to entice customer participation. Couple the *free* message with a *limited time* or a *seasonal urgency* message to boost participation.	*Incomplete.* No documentation.
Develop standard website URLs for marketing materials. A program-specific web address on materials allows the user to quickly find program information, and would allow EAI to easily track website visitors and assess the effectiveness of the materials. The fewer barriers the customer has to finding more information, the greater chances for their program participation.	*In Progress/Partial.* Most marketing materials use vanity URLs, some are generic (/efficiency), while others are program specific (/commercial, /CitySmart, /home, /large commercial, etc.) Program-specific URLs should be incorporated in all new program marketing materials.
Date stamp marketing materials for version control and to manage updates.	*Completed.* Most 2013 marketing materials include the year in which they were produced.
Consider aligning marketing activities, strategies, and	*Completed.* The residential and commercial marketing

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Recommendation	Status
metrics with program goals and creating a metrics framework to monitor each program's performance. Creating a structured plan will help make tracking a priority.	plans (developed by CLEAResult for programs it implemented) include high-level goals, objectives, target audience, and channels. Marketing plans could be supplemented with calendars and metrics.
Develop a metrics strategy for the marketing plan to provide consistent reporting and real-time tracking to make adjustments in program marketing.	*In Progress/Partial.* Some programs are tracking marketing metrics; however, it does not appear to be uniform and is not being done on the portfolio level.
Create a marketing and outreach calendar to ensure that the marketing channels are properly aligned for messaging, targeting, and tracking.	*In Progress/Partial.* Although a number of program created marketing plan/calendars and are tracking events, this approach is not uniform across the portfolio. For example, AES staff tracked marketing efforts and established a marketing calendar. C&I Prescriptive staff created a marketing plan with metrics to monitor marketing effectiveness. CLEAResult staff tracks which CoolSaver materials are most popular among contractors; however, no formal system is in place. Consider developing a portfolio-level calendar and standard process for metrics tracking and reporting.
Redesign the program webpages based on marketing best practices for utility energy-efficiency programs.	*Completed.* EAI updated the program webpages to include quotes and testimonials, imagery, strong calls-to-action, clear program benefits and steps to participation, and links to other programs.

Program Design

In multiple programs, per-unit savings exceeded EAI's planning estimates.

Several programs exceeded their energy-savings goals, some by significant margins, without meeting the participation targets that EAI assumed in planning estimates. However, at the time they developed their 2011-2012 Energy Efficiency Plan, which consisted largely of new programs, EAI did not have historical data upon which to base their planning estimates and no potentials study had been conducted in Arkansas. Rather, they had to rely on broad market assumptions to develop energy-savings targets and other program performance estimates. Additionally, changes to the TRM have allowed some programs to capitalize on new measures with significant energy savings potential at a relatively low cost, exacerbating this discrepancy. For example, personal computer (PC) power management, which was added to TRM 3.0 in 2013, allowed the CitySmart program to exceed its energy savings target with only 64% of EAI's planned participants, while underspending its budget by significant margins. While, the result overall represents a net benefit to EAI's portfolio, as a result, many of the programs' plan targets underestimated the achievable per-unit savings that resulted from the measures offered.

Figure 6 shows actual program participation as a percentage of the program planning goal compared to savings achievement as a percentage of the program planning goal. As the figure indicates, seven

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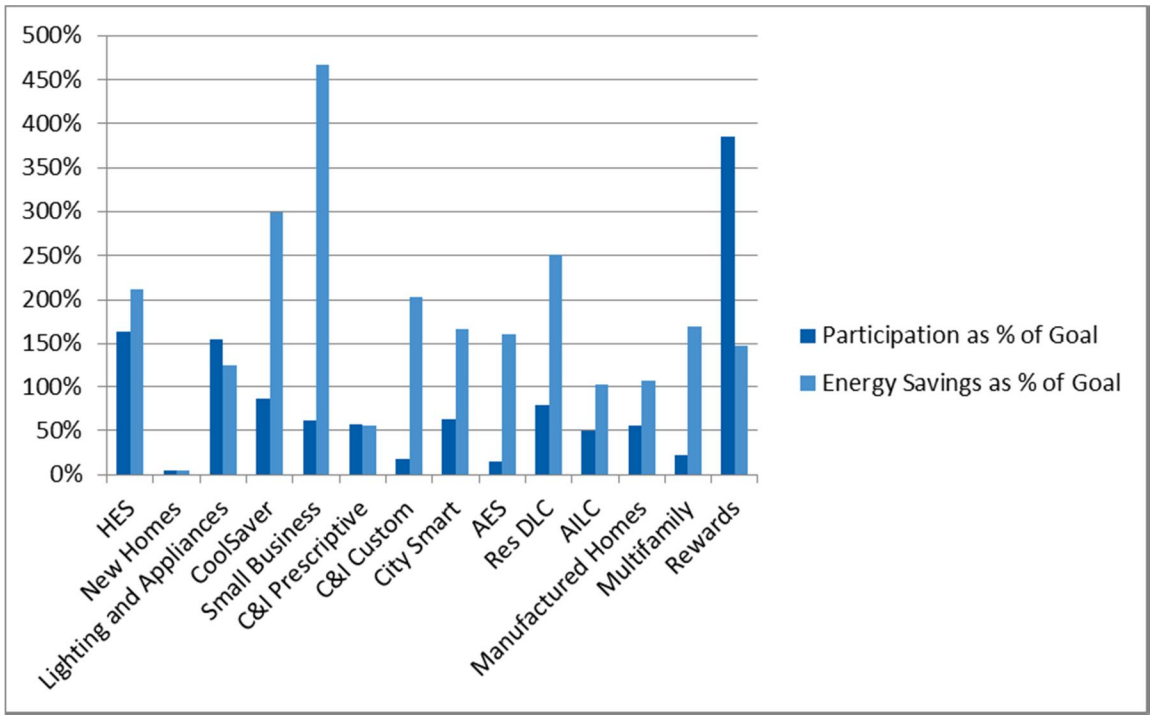
programs (CoolSaver, Small Business, C&I Custom, CitySmart, AES, and Res DLC, and Multifamily) exceeded savings goals by 50% or more while underperforming on their participation targets, indicating those programs achieved higher per-unit savings than anticipated.

Figure 6. Percentages of Program Participation vs. Program Savings Goal Attainment



Engineering Site Visits

EAI staff support helped ensure the Evaluation Team was able to validate projects.

The Evaluation Team conducted 174 on-site verification visits for 6 programs during 2013. Of these site visits, 52 were large C&I projects implemented through the C&I Prescriptive, C&I Custom, and CitySmart programs. EAI provided significant support notifying site verification participants and identifying the most appropriate contact. During these visits the Team confirmed that all measures were installed and operational. We also installed light loggers to confirm hours of operation.

For projects in the C&I Custom Program, the Evaluation Team reviewed and responded to 43 custom project M&V plans submitted by the program implementer. We also coordinated with the implementer to develop standard M&V protocols for compressed air leak repair projects, which included numerous Custom projects in 2013. We identified a variety of issues with energy-savings assumptions for various projects both within the M&V plans we reviewed and with the execution of M&V by the implementer following approval of those plans, primarily associated with custom compressed air and industrial process measures.

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Data Transfer

EAI provided data updates promptly and handled data exchanges in an organized manner.

EAI managed and fulfilled data requests primarily through their ArchEE database. The Team made *ad hoc* data requests to EAI or to the program implementers who then gathered and uploaded data to a secure file transfer protocol server. Staff provided quarterly program tracking data promptly and within the specified time period. EAI updated the ArchEE database weekly or monthly depending on the program, and fulfilled *ad hoc* data requests within a couple of days. The Evaluation Team was impressed with ArchEE database and found it very useful for downloading tracking data whenever updates were needed. We also held regular meetings with the database team to address questions and go over any issues that arose. This data management structure was efficient and minimized redundancy.

Quality Assurance and Verification

EAI did not change its program quality assurance (QA) and quality control (QC) protocols significantly in 2013.

In 2012, the Evaluation Team conducted a detailed review of EAI's QA/QC protocols for each program. At that time, nearly all of EAI's programs had the necessary QA/QC plan elements in place so few additional QA/QC elements were recommended, although plans between programs varied in detail and content. EAI integrated the QA/QC function into numerous programs' manuals in 2012.[8] We recommended that EAI develop separate QA/QC documents, either as stand-alone documents or as sections within existing program manuals, wherever possible.

As expected, 2013 QA/QC protocols remained, for the most part, consistent with 2012, addressing QA/QC procedures related to installation verification, data collection, and customer participation. Specific topics included customer verification, pre- and post-installation inspections, forms, approval processes, and incentive disbursement. EAI made the following updates in response to 2012 Evaluation recommendations. These include:

- Development of a QA/QC Manual for the Rewards Program
- Expansion of the QA/QC protocols in the Res DLC Program Manual to include additional detail on how sites for post installation QA/QC checks are chosen and which elements of the installation should be inspected
- Additional QA/QC detail in the Manufactured Homes Program Manual to reflect data collection procedures and processes for telephone/onsite surveys of residences

Similar to 2012, only two of the 14 programs (HES and AES) had risk articulated in their 2013 QA/QC protocols. The commercial programs (C&I Custom, C&I Prescriptive, CitySmart, and Small Business) do not have written inspection procedures. The QA/QC plans for Res DLC, AILC, Manufactured Homes, and Multifamily do not have written procedures for handling failed inspections.

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[8] These programs included Small Business, C&I Prescriptive, C&I Custom, CitySmart, Res DLC, AILC, Manufactured Homes, Multifamily, and Rewards (pilot program in 2012).

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Table 9 summarizes the 2013 QA/QC verification protocols for all programs within the portfolio. EAI conducts records reviews and/or verification activities of 100% of projects for just over half of the programs. These include on-site verification and database records reviews for residential and commercial prescriptive programs, meter data review for load control programs, and statistical analysis for the Rewards Program.

Savings uncertainty related to the Custom C&I Program is attributable to the inherent complexity of custom projects and large commercial facilities as well as the potential for unforeseen interactions between installed and existing systems and equipment. Despite the absence of QA/QC protocols for the AES Program, the Team conducted independent surveys that verified savings and supports the low level of uncertainty. The Rewards Program received high level of savings uncertainty due to the lack of specifics related to the variables that are tested and the absence of documented mitigation in the event that differences arise between treatment and control group characteristics.

With the exception of C&I Custom and Rewards, all programs have low to medium levels of savings uncertainty, validating that this this level of QA/QC rigor is sufficient to ensure savings realization.

Table 9. QA/QC Protocols

Program	Verification Approach	Sample	Written Protocols in Place? (Y/N)	Savings Uncertainty Level (High, Med, Low)
HES	Site visits	10%	Yes	Low
New Homes	Site visits	100%	Yes	Low
	Desk reviews (database records)	≥3%		
Lighting and Appliances	Site visits	100%	Yes	Low
CoolSaver	Site visits	1%	Yes	Medium
	Desk reviews (database records)	100%		
Small Business	Site visits	100%	Yes	Low
C&I Prescriptive	Site visits	100%	Yes	Medium
C&I Custom*	• Deemed or stipulated savings (any project) • Key or all parameter measurements (Option A or Option B projects) • Desk reviews (bills, meter data) (Option C projects) • Simulation (Option D projects)	20%	No	High
CitySmart*				Medium
AES	Lighting calculations**	100%***	No	Low
Res DLC	Site visits	5% of digital control units	Yes	Low

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Program	Verification Approach	Sample	Written Protocols in Place? (Y/N)	Savings Uncertainty Level (High, Med, Low)
		(DCU)		
	Desk reviews (meter data)	120 sites		
AILC	Site visits	As needed based on review of installation invoicing	Yes	Low
	Desk reviews (meter data)	100%		
Manufactured Homes	Site visits	3%	Yes	Low
Multifamily	Site visits	3%	Yes	Low
Rewards	Statistical analysis (t-tests)	100%	Partial****	High

* The implementer of the C&I Custom and CitySmart programs has discretion to select the most suitable verification approach for each project. Project designations (Option A, B, C, or D) guide the selection of M&V approach.
** M&V for the AES Program consists of prescriptive and custom energy-savings calculations that address the needs of each product and installation. EAI's energy-savings calculator adheres to APSC requirements.
*** Although the AES Program Manual specifies a sample size of 10%, 100% of program installations have been verified to date.
**** The Evaluation Team was not provided with details on t-tests that are performed for the Rewards Program.

Customer Satisfaction

Program satisfaction continued to be high across the portfolio.

The Evaluation Team surveyed participating customers in 14 programs across the residential and nonresidential sectors, seven of these programs provided input to the 2012-2013 program satisfaction trend questions.[9] In each survey, we asked customers to rate their satisfaction with their program experience, as well as with EAI as a service provider.[10]

[9] Res DLC, CoolSaver, and HES support the 2012 and 2013 residential program satisfaction results. C&I Prescriptive, C&I Custom, Small Business, ALIC, and CoolSaver support the 2012 and 2013 nonresidential program satisfaction results.

[10] The CoolSaver survey supports the 2012 and 2013 residential utility satisfaction results. C&I Prescriptive, C&I Custom, Small Business, and CoolSaver nonparticipant surveys support the 2012 and 2013 nonresidential utility satisfaction results.

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The results were tremendously positive, with the majority of residential and nonresidential customers continuing to rate their program satisfaction in the 19th percentile.[11] In addition, residential and nonresidential customers overwhelmingly (95%+) continued to report high satisfaction with EAI as a service provider.[12] Furthermore, nonparticipant nonresidential customers reported nearly identically high satisfaction ratings in 2013 (93%) as in 2012 (92%).[13]

Trade Ally Response

Trade allies continued to be generally satisfied with participation; however, there remains room for improvement.

All 25 trade allies the Team interviewed expressed satisfaction with their program experience.[14] Several trade allies said that program participation contributed to their business growth over the last year. In addition, trade allies agreed that program implementers provided satisfactory support, specifically mentioning that the implementation staff was quick to respond and resolve any issues.

Although the trade allies did not have training suggestions, several C&I Custom and C&I Prescriptive trade allies expressed interest in attending networking opportunities to broaden their ability to work across services, such as to help lighting vendors and HVAC contractors work together to sell more comprehensive projects. In addition, a number of the C&I trade allies noted that the most difficult part of their job was convincing customers that the programs are legitimate, and hoped that EAI might be able to help persuade customers of the programs legitimacy. Several HES trade allies reported that they found it difficult to track the submitted paperwork and requested the implementer track each job individually through the approval and payment process, as well as providing a way for the trade allies to track this status.

Despite the general satisfaction reported by trade allies, program staff reported that only a small portion of the nonresidential network trade allies actively participate. Program staff also reported that inactive trade allies tended not to attend program-sponsored training, which resulted in them having misconceptions about program operations.

Innovative trade allies led to increased HES Program participation.

Implementation staff reported that they recruited a number of new HES trade allies in 2013. These trade allies delivered the program using a one-stop model, in which they completed the energy assessment

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11 Residential program satisfaction in 2012 was 94% (n=204), and in 2013 was 95% (n=216); nonresidential program satisfaction in 2012 was 92% (n=174), and in 2013 was 97% (n=276).

12 Residential participants' satisfaction with EAI as a service provider in 2012 was 95% (n=44), and in 2013 was 97% (n=69); nonresidential participants' satisfaction with EAI as a service provider in 2012 was 96% (n=174), and in 2013 was 95% (n=276).

13 2012 (n=85); 2013 (n=277).

14 The Team spoke with five HES contractors and with 20 contractors who installed measures in the Small Business, C&I Custom, and/or C&I Prescriptive programs.

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and installed a number of the recommended measures in one visit. These new methods compelled a number of the existing trade allies to embrace this new delivery mechanism (see the Home Energy Solutions Program section for details).

A centralized trade ally coordinator offers efficiencies for participating trade allies.

In 2013, CLEAResult hired a trade ally coordinator to serve as a central point of contact for commercial trade allies (in C&I Prescriptive, C&I Custom, CitySmart, and Small Business). The majority of trade allies agreed that the coordinator's support improved their participation experience. Many trade allies offer cross-program services (for example, some lighting installers and distributors offer air compression and HVAC), and therefore participate in numerous commercial programs throughout the program year. In addition to supporting trade ally participation, this single point of contact increased program implementation efficiency by grouping all commercial program responsibilities together. Furthermore, as EAI will reduce the number of field customer representatives for commercial programs in 2014, trade allies will need to play a larger role in engaging customers and may require additional support from the trade ally coordinator (see commercial program sections for details).

Unexplained trade ally attrition in 2013 was masked by an overall increase in new trade ally recruitment.

In 2013, the implementation vendor recruited 80 new trade allies to participate in EAI's commercial programs for a total of 132 trade allies. However, the Evaluation Team analyzed the trade ally database and found that 28 of the 80 companies who had been registered trade allies in 2012 were no longer listed as registered trade allies in 2013. These changes resulted in a net increase of 52 trade allies in 2013.

Marketing

Use of marketing plans, calendars, and metrics were more prevalent in 2013 than in 2012; however, they would benefit from further enhancement and formalization across the portfolio.

The Evaluation Team found that for most programs, EAI developed and used program marketing plans in 2013. CLEAResult, for example, developed and used both residential and commercial marketing plans for the suite of programs that it implements on behalf of EAI. Upon review of these documents, the Evaluation Team found the plans include high-level goals and objectives, definition of a target audience, and overview of the marketing strategy, messages, and channels. Furthermore, most of the existing marketing plans are fairly integrated based on a range of variables including target audience, preferred communication channels, and motivators and barriers to participation. This enabled the program implementer to reach different audiences through a variety of outreach channels.

While some of the programs report tracking metrics (impressions, direct mail response, email metrics, etc.), there did not appear to be a formal process or strategy in place for collecting, reporting, and analyzing each programs' marketing strategies and tactics. Formalizing this process would be beneficial at both a program and portfolio level to evaluate the effectiveness of each tactic, in an effort to inform short- and long-term planning, but will increase program cost. As most programs achieved their targets

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in 2013, it may not be necessary for EAI implement formal tracking procedures at this time. As the portfolio evolves, EAI will need to strike the proper balance between marketing expenditures and the need to drive additional energy savings.

EAI's updated program webpages provided a more user-friendly experience.

EAI updated the program webpages in 2013 based on the 2012 evaluation recommendations. Overall, the updated program webpages include refined messaging, updated program descriptions, program imagery and colors, brief customer testimonials, and highlighted call-to-actions with program contact information. Furthermore, EAI conducted a significant redesign and optimization of the online portal for the Rewards Program that improved its usability and visual appeal.

For many programs, EAI used optimized and tailored marketing efforts to reach specific audiences and/or overcome participation barriers.

EAI further refined program-specific marketing efforts in 2013 to reach target audiences in a way that overcame participation barriers the Team had identified in the 2012 evaluation based on reported lessons learned in implementing the programs. Examples of this include the addition of coffee chats to engage agricultural customers and the use of bilingual canvassers to reach potential Spanish-speaking participants in the Manufactured Homes Program. By refining and narrowing target audiences, EAI and implementation staff engaged customers through their preferred communication channels.

Programs leveraged customer relationships by developing and showcasing case studies.

EAI made productive use of customer testimonials in 2013 through broad-based awareness mass media for the AES and Rewards programs. By identifying and recognizing these program champions, EAI promoted word-of-mouth advertising and enabled potential participants to engage and identify with past participants.

EAI's marketing tactics match residential preferences.

Just over one-third of residential customers (35%, an increase from 25% in 2012) reported first hearing about EAI programs through bill inserts (Figure 7), which aligns with how the majority of residential customers indicated they prefer to receive program information (62% in 2013; Figure 8). Nearly one-quarter of the residential customers (22%) said they heard about EAI's programs by word-of-mouth (friend, family member, or colleague). This response commonly underscores the success of a diverse marketing campaign. Increased program participation leads to more customers talking about the programs they participated in, which in turn leads potential participants to engage with the program.

The most noticeable decline in how customers' heard about residential programs in 2013 was from a trade ally. In 2012, 29% of residential customers reported hearing about programs from trade allies, compared to only 9% of customers in 2013.

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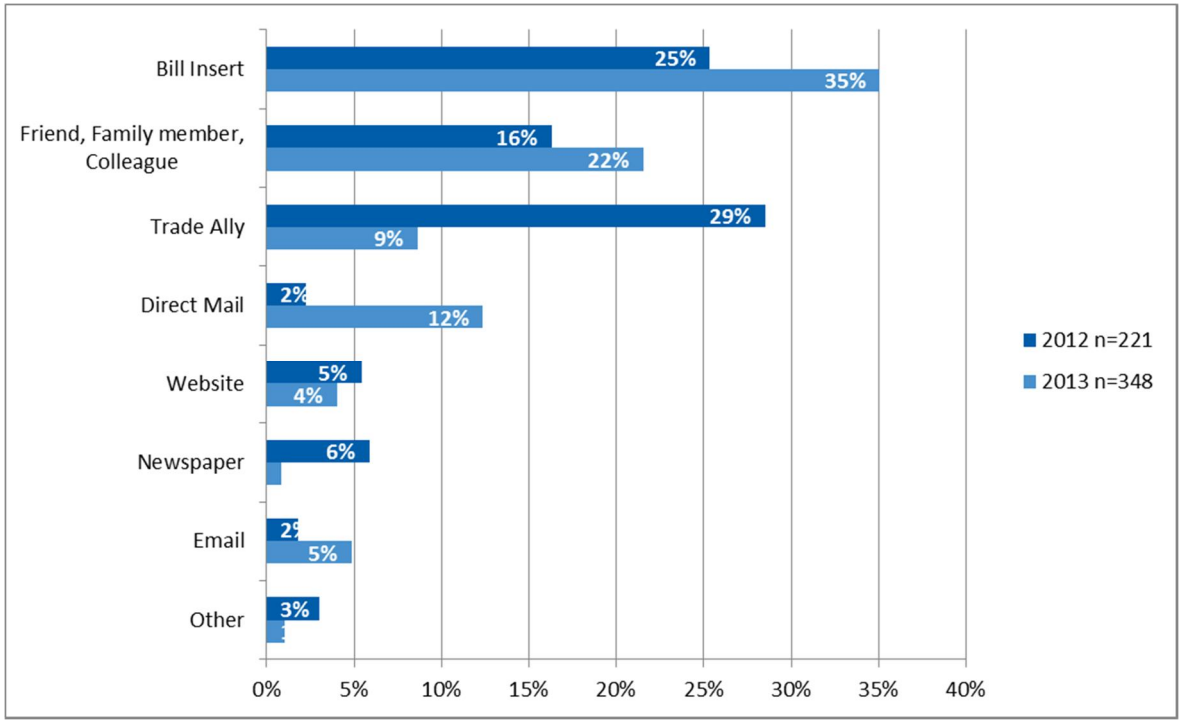
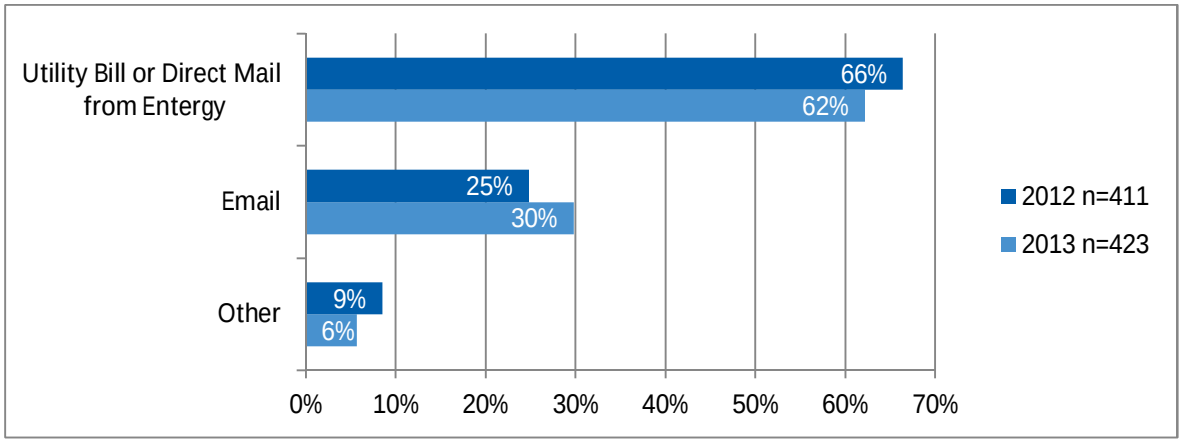
Figure 7. How Residential Customers Heard About EAI Programs



Multiple survey questions for Res DLC, CoolSaver, Rewards, and HES, see Appendix A.

Figure 8. Residential Customers' Preferred Method of Hearing About Programs



Multiple survey questions for Res DLC, CoolSaver, Rewards, and HES in 2013 and for CoolSaver in 2012, see Appendix A.

Individual outreach was the primary way nonresidential customers heard about EAI's programs.

As shown in Figure 9, over half (54%) of nonresidential customers indicated they heard about EAI programs from an individual (trade ally (18%), word-of-mouth (family, friend, or colleague, 21%), or EAI representative (15%). In 2013, nonresidential customers reported a more even distribution of how they learned about programs than they did in 2012. Most notable is the decrease in learning about programs

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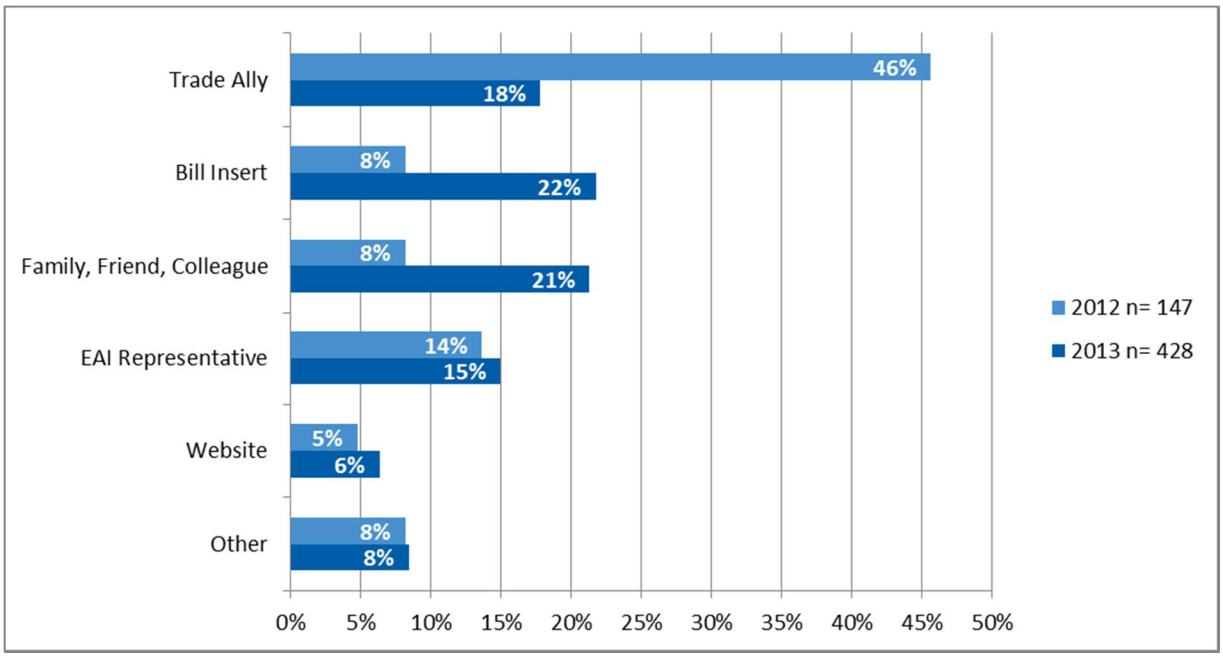
from a trade ally, dropping from 46% in 2012 to 18% in 2013. There was an increased influence of word-of-mouth and bill inserts (from both being 8% in 2012 to being 21% and 22% in 2013, respectively).

Figure 9. How Nonresidential Customers Heard About EAI Programs



Multiple survey questions for C&I Prescriptive, C&I Custom, Small Business, CoolSaver, and non-participant AILC, see Appendix A.

Technical Reference Manual

The TRM 3.0 does not align with findings from Arkansas-specific primary research.

For non-custom measures, the Evaluation Team made extensive use of savings algorithms published in Arkansas TRM Version 3.0 (TRM 3.0). Because parameter values in TRM algorithms were generally derived from research in jurisdictions outside of Arkansas, the Evaluation Team refined some values using primary data we collected from Arkansas utility customers. In several instances, where parameter uncertainty was high and where the corresponding effect on savings was high, the Team gathered primary data specifically in order to capture a more accurate value for Arkansas and thus improve the accuracy of the savings estimate. We provide details of the Evaluation Team's use of the TRM to calculate program savings in the Evaluation Methodology section of this report. Below, we provide a summary of those efforts and their result. Each is elaborated more fully in the corresponding program section.

Residential Lighting Usage

The Evaluation Team performed a residential light logging study in 2013, which informed many parameter values for the TRM residential lighting algorithm. We include a detailed discussion of the

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methodology and results in the Residential Lighting and Appliances Program section, but the major findings are these.

- *Hours-of-Use (HOU).* The Evaluation Team calculated the residential HOU for CFLs to be 2.17. Incandescent lamps had a lower HOU at 1.74, and the overall average was 1.88. We observed CFLs being placed in higher use areas of Arkansas homes. TRM 3.0 stipulates 803.6 annual operating hours (AOH) for indoor CFLs and 1,132.3 AOH for outdoor CFLs, equivalent to 2.20 and 3.10 average daily HOU, respectively.
- *Interactive Effects Factor (IEF).* The Team calculated energy, demand, and gas IEFs for five home HVAC scenarios, as well as an overall weighted average. The weighted averages yielded an IEF_E of 0.97, IEF_D of 1.25, and IEF_G of -0.0063, respectively. TRM 3.0 stipulates IEF_E values separately for different heating equipment but, applied to the distribution of HVAC equipment in Arkansas, would yield an IEF_E of 0.85. The TRM 3.0 value for IEF_D is 1.53, and for IEF_G is -0.0231.
- *In-Service Rate (ISR).* We observed that 92.6% of CFLs and 100% of LEDs were in service in the homes we visited.[15] TRM 3.0 stipulates an ISR for upstream programs of 0.86. Following the U.S. Department of Energy's Uniform Methods Protocol, we also gave first-year credit for storage lamps from 2013 that will be installed in 2014 and 2015, netting those savings back to the 2013 program year.[16]
- *Coincidence Factor.* The Team estimated a mean weighted coincidence factor (CF) of 10% for the TRM 3.0-listed peak period of non-holiday summer weekdays from 3:00 p.m. to 7:00 p.m. This compares to the TRM 3.0 value of 9%.

Commercial Lighting Annual Operating Hours

The Evaluation Team metered commercial lighting projects over two years.[17] Based on metering 139 circuits at 18 office buildings, the Team applied new values of 3,227 AOH and 0.50 CF for office buildings. This compares with 3,737 AOH and a 0.77 CF in TRM 3.0.

Although the Team estimated adjustments to other building types participating in EAI C&I programs, the current estimates are similar enough to the TRM values that we do not, as of this evaluation, propose adjusting them.

Central Air Conditioner Tune-Ups

Beginning in 2013, the program requires only post-tune-up measurements (i.e., CLEAResult uses the average efficiency improvement from a 2012 CoolSaver tune-up to estimate savings for tune-ups

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15 Due to a low LED sample size, the Evaluation Team reverted to the TRM 3.0 ISR of 95% to calculate LED impacts.

16 U.S. Department of Energy National Renewal Energy Laboratory. *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures.* 2013.

17 For this analysis, the Evaluation Team pooled commercial metering data from site visits conducted in both SWEPCO and EAI territories in 2012 and 2013.

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performed in 2013). While this approach makes the program more attractive to contractors, the Evaluation Team had to work extensively with CLEAResult and the Independent Evaluation Monitor (IEM) to develop an alternative savings calculation methodology that would not rely on pre-tune-up measurements.

To measure savings in 2013 in the absence of pre-tune-up measurements, the Evaluation Team estimated the average efficiency improvement using approximately 3,000 CoolSaver pre- and post-tune-up measurements taken during 2012. The Team used this data to calculate savings using the TRM 3.0 savings calculation methodology, rather than using deemed values provided in the TRM tables that correlate refrigerant charge adjustment to efficiency loss.

While the TRM 3.0 identifies refrigerant charge adjustment as the source of tune-up savings, CLEAResult calculated an efficiency loss percentage from their 2012 CoolSaver pre- and post-tune-up measurements.

In order to better understand sources of tune-up savings, the Team looked at pre- and post-tune-up EER values from systems that did or did not receive refrigerant charge adjustments. We used a different method, known as compressor mapping, to verify 2013 efficiency loss and to establish that CLEAResult's savings estimates were reasonable. We conducted site visits to verify the CoolSaver pre- and post-tune-up efficiency measurements for 42 units in 2013. The technical details of CLEAResult's method and the Team's compressor mapping method are provided in the CoolSaver Program section of this report.

Leakage

As expected, significant leakage of upstream program lighting products took place in EAI's service territory.

In EAI 2012 *Energy-Efficiency Portfolio Evaluation Report*, the Evaluation Team noted our suspicion that a significant portion of program bulbs distributed through the Lighting and Appliances Program were leaked to areas outside its service territory. In 2013, under direction from the IEM and drawing on the TRM 3.0 Protocol K, the Evaluation Team quantified the leakage rate by conducting a multimode survey of 3,000 randomly selected Arkansas residents. With the survey, we collected 532 responses from customers representing approximately 40 different utilities,[18] and applied the responses to the quantity and configuration of stores participating in EAI's CFL program. This yielded an EAI leakage value of 28.92% for 2013, a decrease of 3.8% from the evaluated leakage rate in 2012. Our methodology and additional findings from this survey are described in detail in the Residential Lighting and Appliances Program section.

[18] Due to respondents' use of different shortened utility names and abbreviations, we were not able to determine the exact number of utilities they represented.

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High Impact Measures

Lighting produced the majority of savings in both the commercial and residential sectors.

Figure 10 shows the relative energy savings of C&I measures installed through EAI's programs. The *Lighting* category accounted for about 43% of C&I program energy savings. This category includes all lighting measures except *CFL* (1.22%). After lighting measures, custom measures produced approximately 30% of total C&I savings and PC Power Management produced 7%.

Figure 10. High-Impact C&I Measures

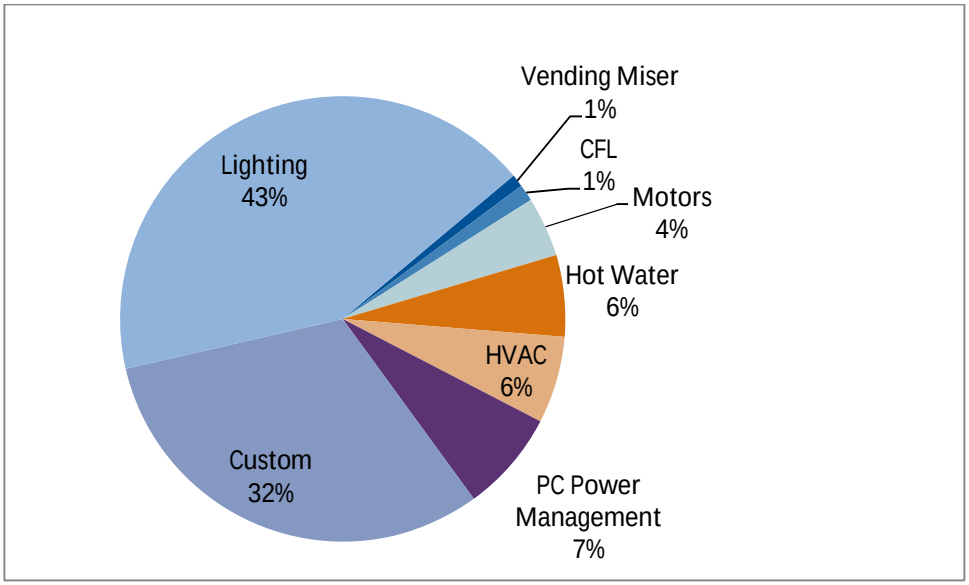

Figure 11 shows the relative energy savings of residential measures installed through EAI's programs. CFLs accounted for nearly two-thirds of savings, followed by HVAC measures (13%) and behavioral changes (11%).

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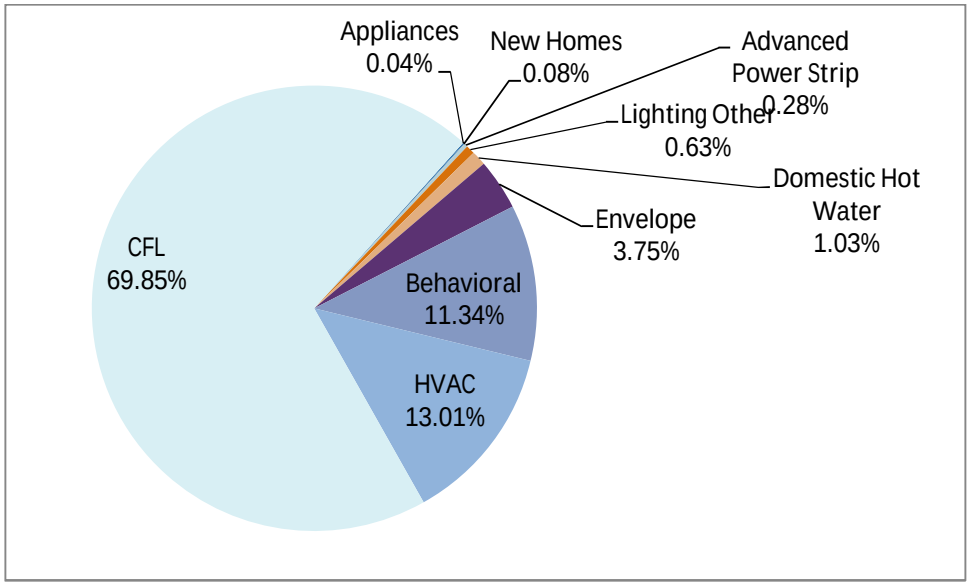
Figure 11. High-Impact Residential Measures



Comprehensiveness

In compliance with APSC C&EE Rules, the Evaluation Team assessed each of seven factors described in the Comprehensiveness Checklist.[19] In 2012, the Team conducted an exhaustive evaluation to assess EAI's overall compliance with the comprehensiveness factors. In 2013, we re-assessed areas that we identified in 2012 for potential improvements and documented new activities implemented in 2013 that contribute to EAI's overall comprehensiveness. A description of our 2013 comprehensiveness factors evaluation methodology is provided in the Evaluation Methodology section of this report. Our findings relevant to each factor are outlined below.

Factor 1: Education, Training, Marketing, and Outreach

Whether the programs or portfolio provide, directly or through identification and coordination, the education, training, marketing, or outreach needed to address market barriers to the adoption of cost-effective energy-efficiency measures.

The Evaluation Team reviewed Factor 1 as three separate components: 1) education, 2) training, and 3) marketing and outreach. Each component is addressed below.

[19] APSC Order No. 17 in Docket 08-144-U

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Education

In 2012, the Evaluation Team found that, with few exceptions, EAI's education programs included activities and materials aimed at educating customers about the benefits of energy efficiency, ways to save energy, and the benefits of program participation in conjunction with standard marketing and outreach practices. New findings in 2013 include:

- In response to the Evaluation Team's 2012 finding that EAI conducted very little educational outreach via social media, EAI implemented Facebook and Twitters postings across several programs.
- EAI developed case studies to supplement existing customer educational collateral, including brochures, fact sheets, energy reports, and program websites.
- For C&I programs, EAI and the implementers now offer customer education in the form of direct outreach through meetings, presentations, and events that educate customers about program benefits.
- The Multifamily Program had a lesser focus on customer education than some other programs, but since that program's interactions occur largely with property managers as opposed to residents, this finding is neither surprising nor inappropriate.

Training

In 2012, the Evaluation Team found that, in general, EAI provides good training opportunities to its contractors across nearly all programs. Similar contractor training opportunities were present in 2013. For those reviewed, training procedures were consistent with best practices. In addition, as we saw in 2012, several of the programs offer training in partnership with other groups, such as local community colleges and technical schools.

Marketing and Outreach

Because relevant goals and activities associated with marketing and outreach are often intertwined, the Evaluation Team assessed marketing and outreach jointly. In 2012, we found that EAI's programs used diverse marketing and outreach strategies that are consistent with best practices.

New findings in 2013 include:

- Most programs have a marketing plan in place, with the exception of the C&I Custom and New Homes Programs.
- Several program staff reported tracking and monitoring marketing metrics, as recommended in 2012.
- All of the program web pages included revised program information, consistent messaging, clear calls-to-action and integration of new elements such as testimonials and imagery.

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- Upon review of new materials, the Evaluation Team found that EAI's programs consistently used many best practice strategies and diverse marketing and outreach tactics to overcome barriers and target specific customer sectors.
- In 2013, EAI developed new case studies as well television advertisements that include customer testimonials.

Factor 2: Budgetary, Management, and Program Delivery Resources

Whether the program and/or portfolio have adequate budgetary, management, and program delivery resources to plan, design, implement, oversee, and evaluate energy-efficiency programs.

To evaluate budget and resource sufficiency, the Evaluation Team assessed performance indicators associated with the adequacy of budget allocations, the cost per kWh saved, and whether program staff and trade ally support was sufficient to support program goals.

As discussed earlier in the Portfolio Performance section, EAI was on target with its 2013 spending, net energy savings, and demand reduction goals. EAI delivered several of its top performing programs, including Lighting and Appliances, CitySmart, Small Business, and Rewards, at a costs/kWh less than $0.20. In contrast, New Homes, the poorest performing program in the portfolio, shows a higher than average cost/kWh of $6.45.

Table 10. Budget Allocation and Program Goal Attainment

Program	Cost/kWh*
HES	$0.51
New Homes	$6.46
Lighting and Appliances	$0.09
CoolSaver	$0.22
Small Business	$0.19
C&I Prescriptive	$0.22
C&I Custom	$0.21
CitySmart	$0.15
AES	$0.21
Res DLC	NA
AILC	NA
Manufactured Homes	$1.26
Multifamily	$0.73
Rewards	$0.15
Total	$0.25

*Based on a simple calculation of program spending divided by first year savings

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Overall EAI portfolio spending was almost identical to budget, while energy savings and demand reduction topped expectations by 25% and 26%, respectively. 2013 findings include the following:

- The five energy efficiency programs that exceeded budget also exceeded energy savings goals by a higher factor than their budget overruns. For example, the Small Business Program, which overspent its budget by just 13%, achieved energy savings by a factor of almost 5:1 and demand reductions by close to 3:1. HES, which spent 179% of its budget exceeded its energy savings goal by 277%. With the exception of Multifamily, all of these programs surpassed demand reduction goals by margins that either mirrored or outpaced program spend. This suggests that EAI wisely focused priorities on participant and trade ally outreach and allocated funds to capitalize on the market's highest level of interest in the portfolio.
- Lighting and Appliances registered the lowest cost/kWh at $0.09 while coming in at 36% percent below budget and 24% and 81% above its respective energy savings and demand reduction goals. The continued strength of this program reflects high customer and trade ally satisfaction as well as EAI's success expanding the program through a diverse marketing and outreach strategy.
- Spending was 28% lower than allocated budget for both C&I Prescriptive and New Homes, and these programs continued to underperform. The C&I Prescriptive Program performance most likely reflects the decision of many large accounts to opt out of Arkansas energy-efficiency programs as well as a trend in 2013 for C&I Customers to pursue the higher incentives available through the Custom program. The New Homes Program's performance, including a cost/kWh at $6.45, suggests a weak local construction market may be undermining participation in the program.
- With program spending at approximately 69% of budget, the AES Program increased its energy savings performance over last year and exceeded its 2013 goals by 61%. This result can be partially attributed to significant customer uptake of CFL lighting and custom LED lighting for poultry houses, which produces good savings at a relatively low cost.
- Both load control programs significantly outpaced program spend. Despite a cooler than average season, Res DLC exceeded its demand reduction target by a notable margin (251%). AILC met its demand reduction targets (103%) while underspending its 2013 budget by 33%. Although, similar to AES, AILC faces challenges related to attracting agricultural sector participation, its positive performance suggests higher-than-expected savings for customers who chose to participate.
- The Rewards Program topped its energy savings goal by more than 50% while limiting spending to 102% of budget, suggesting that program participants are acting on the recommendations provided through the program.

Staff and Trade Ally Support

Mid-way through 2013, EAI's energy-efficiency team lost one staff member, but EAI has plans to replace that position in 2014. According to staff, while this personnel shift caused EAI to reassign some program

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management responsibilities internally, the transition has gone smoothly. Regardless of this loss, EAI's staff of five professionals delivered a successful portfolio of energy-efficiency and demand reduction programs, achieved energy and demand savings targets while underspending the portfolio budget, expanded their programs' marketing reach, and retained high customer and trade ally satisfaction.

In addition to its internal energy efficiency staff, EAI draws on support from outside contractors and implementers to support program delivery and administrative functions. In 2013, EAI's implementation contractors implemented several targeted staffing additions that were highly beneficial to program performance:

- CLEAResult hired a trade ally coordinator to serve as a central point of contact for commercial trade allies. The majority of trade allies agreed that the coordinator improved their participation experience as she provides support for all commercial programs.[20]
- ICF added a fluent Spanish speaker to its Manufactured Homes program team, which proved to be a significant benefit to the program.
- For the AES Program, ICF added a farm-industry representative to its staff. This has enabled the AES implementation team to develop messages that resonate with farmers.

According to program staff, in 2014, EAI intends to reduce the customer representative staff for commercial programs. While not a formal member of the energy-efficiency team, this staff position served as a liaison for large commercial customers, promoting EAI's efficiency programs and helping large customers navigate the participation process. Program staff reported that they were proactively investing in developing relationships with and creating support mechanism for trade allies to help cover this gap.

Factor 3: Major End Uses Addressed

Whether the programs and/or portfolio reasonably address all major end-uses of electricity or natural gas, or electricity and natural gas, as appropriate.

To assess Factor 3, the Evaluation Team identified the end uses addressed by each program. In 2012, the Evaluation Team found that EAI designed its programs to offer customers a diverse range of choices: while some programs offer a small number of discrete measures, other programs encourage participants to implement comprehensive projects. In total, the portfolio covers all major end use categories for either the residential or commercial sectors, or both. Several programs provided customers on-site facility assessments or technical assistance to support customers who wish to invest in comprehensive upgrades.

[20] C&I Prescriptive, C&I Custom, CitySmart, and Small Business.

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To further expand the breadth of its program offerings, EAI added new measures in the following programs:

- Lighting and Appliances added LED bulbs.
- AES added LED bulbs.
- CitySmart added PC power management.
- Motors were added to the AES program.

Factor 4: Comprehensively Address Customer Needs

Whether the programs and/or portfolio, to the maximum extent reasonable, comprehensively address the needs of customers at one time, in order to avoid cream-skimming and lost opportunities.

In assessing Factor 4, the Evaluation Team reviewed the extent to which EAI offers technical support to educate customers on cost-effective, comprehensive projects and/or whether it provides incentives that encourage participants to install multiple measures and/or those with higher efficiency levels that increase the project comprehensiveness.

The Evaluation Team's 2012 findings revealed that EAI's portfolio offered customers flexibility to participate at a level of their choice – from installing a single measure to implementing a comprehensive suite of energy-efficiency upgrades. This best practice provides flexibility and offers customers an opportunity to improve their home or business efficiency at a range of price points. EAI designed several of the programs to reward customers for implementing comprehensive projects or multiple measures. In programs offering comprehensive project options, EAI also uses incentive structures designed to encourage comprehensive upgrades and offers technical support to customers interested in pursuing this option. Note that because the Lighting and Appliances and CoolSaver Programs generally target single end-uses, and because the load control programs are not energy-efficiency programs, these were not applicable to our analysis of Factor 4.

In 2013, EAI continued to broaden opportunities for customers to engage in comprehensive efficiency projects. Relevant findings for 2013 follow:

- EAI made adjustments to HES program delivery in 2013, which resulted in many contractors offering assessments and installations in one visit, making it less complicated and less expensive for customers to implement comprehensive upgrades;
- EAI added a new tier (Tier 1 Special Rate homes) to the New Homes Program for homes built 15% above Arkansas Development Finance Authority (ADFA) regulations;
- EAI filed a request with the APSC to add tiered incentives in 2014 to the C&I Prescriptive Program as part of a larger program re-alignment. If denied, permission will be re-submitted for 2015; and
- A provision allowing C&I Prescriptive Program customers to bundle prescriptive measures with custom measures to gain access to the C&I Custom Program's tiered incentive structure.

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The programs listed in Table 11 include home or building efficiency assessments or surveys that result in recommendations for comprehensive energy-efficiency upgrades for the participants' home or facility. Our findings in 2012 indicated that implementers did not necessarily use these customer interactions to identify and promote comprehensive measure packages or facility upgrades. We found that implementers and trade allies frequently capitalized on the most cost-effective measures and did not actively seek to maximize the depth of savings available in customers' facilities.

EAI's efforts to improve the comprehensiveness of project installations yielded improved results in 2013. Table 11 shows the percentage of projects in each program that entailed the installation of more than one measure versus those that resulted in the installation of a single measure.

Table 11. Installation of Multi-Measure Projects

Program	Single-Measure Projects	Multi-Measure Projects
HES	57%	35%
Small Business	64%	36%
C&I Prescriptive	84%	16%
C&I Custom	76%	24%
CitySmart	60%	40%
AES	73%	27%
Manufactured Homes	1%	99%
Multifamily	2%	98%

Factor 5: Targeting and Leverage

Whether such programs take advantage of opportunities to address the comprehensive needs of targeted customer sectors or to leverage non-utility program resources.

The Evaluation Team assessed whether EAI's portfolio provided diverse energy-efficiency opportunities to every major customer sector. We also evaluated each program's use of external resources to promote the program and/or to improve customers' project returns.

In our 2012 evaluation, the Team found that EAI's portfolio offered opportunities to engage in energy-efficiency to every customer sector.

The Evaluation Team also reviewed each program's use of external partnerships and resources for promotion, leveraging funding, offering implementation assistance, or creating economies of scale to improve program effectiveness, reduce customer barriers, or maximize delivery assistance. Findings in 2012 showed that EAI is a strong proponent of collaboration.[21] In 2013, EAI and program implementers continued to promote the programs through partner organizations and trade allies. EAI supported trade

[21] The Evaluation Team also investigated collaborative and leveraging opportunities for *Comprehensiveness Checklist* Factor 1 (marketing and training).

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and community allies through trainings, meetings, events, visits and through distribution of marketing collateral and support.

Examples of 2013 efforts include:

- Some of the C&I programs created refined targets this year. CitySmart has focused on schools and wastewater treatment, while the Agricultural Solutions program has looked toward poultry, hog, corn, and rice farmers.
- EAI continued to build and foster community relationships through presence at trade shows, home shows, Earth Day, retailer demonstrations, etc. Furthermore, programs collaborated with local community allies such as trade associations and chambers of commerce.
- EAI identified areas for cross-promotion of programs. For example, the CoolSaver implementer recognized an opportunity to market the program through C&I programs by educating employees and distributing a commercial leave-behind that was developed to solicit residential participation from employees of a commercial facility.
- In 2013, EAI added a new "Special Rate" incentive tier to the New Homes Program to encourage builders working on low-income housing projects to participate in the program

Factor 6: Cost-Effective Energy Efficiency

Whether the programs and/or portfolio enable the delivery of all achievable, cost-effective energy efficiency within a reasonable period of time and maximize net benefits to customers and the utility system.

To evaluate Factor 6, the Evaluation Team assessed three key performance indicators: 1) whether programs achieved their Plan goals, 2) NTG results by program, and 3) program cost-effectiveness. Table 12 provides an overview of each programs' achieved savings as a percentage of their goals, NTG ratio, and cost effectiveness from three perspectives: Total Resources Cost (TRC), Participant Cost Test (PCT), and Program Administrator Cost (PAC) test results.

Ten of EAI's 12 energy-efficiency programs[22] met or exceeded their energy-savings goals, and 9 of the 14 programs achieved their demand-savings goals. This is an improvement over 2012 results, when nine of EAI's 12 energy-efficiency programs[23] met or exceeded their energy savings goals, but only six of 14 programs achieved their demand savings goals.

The Evaluation Team did not calculate NTG for the Res DLC, the AILC, or the Rewards programs. Of the remaining 11 programs, three achieved a calculated NTG ratio of at least 1.0, and the C&I Prescriptive Program achieved an NTG ratio of 0.99. The CoolSaver Program demonstrated the strongest

[22] Res DLC and AILC are demand-response programs, so they are not included in energy-efficiency savings performance indicators.

[23] Demand response programs (Res DLC and AILC) are not included in energy-efficiency savings performance indicators.

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performance with an NTG ratio of 1.10 and energy savings of 467%. We calculated NTG values of less than 1.0 for seven programs. This includes the Lighting and Appliances Program, where we applied the APSC-stipulated NTG value of 0.8 to all measures except CFLs, which we calculated at 0.50. Because this program draws heavily on its CFL component, which generally is associated with high freeridership rates due to market transformation effects, the lower NTG values are not unusual for programs of this type. EAI's portfolio achieved a blended NTG ratio of 0.91.

It is impossible to determine whether a program maximizes net benefits to customers and the utility. However, various cost-effectiveness test results indicate a program's benefit-to-cost (B/C) ratio from the perspectives of different program stakeholders. The PCT informs whether the benefits participants receive from programs outweigh their cost to participate, while the PAC test reveals whether the utility's energy-savings benefits outweigh its costs to deliver the program or portfolio, and the TRC test provides a blended B/C ratio from the perspective of all program stakeholders. In general, results exceeding 1.0 indicate program cost-effectiveness from the perspective of the test being evaluated.

EAI's portfolio was cost-effective, achieving a TRC ratio of 2.18.[24] Ten of EAI's 14 programs achieved TRC and PAC ratios above the 1.0 threshold, indicating they are cost-effective from the total resource and utility perspectives. For the four programs that did not achieve the TRC or PAC thresholds, the cost to deliver these programs was high in comparison to the savings they achieved. The Multifamily Program nearly met the TRC threshold, however, achieving a TRC ratio of 0.96. The relatively low TRC result for the New Homes Program is not surprising given its low participation results and also not a-typical for residential new construction programs, particularly in their early years, as these programs often require significant market development costs and several years to ramp up. Finally, for both the Manufactured Homes and Rewards Programs, the higher cost of marketing and delivery combined with the relatively low incremental, per-participant savings available through direct-install measures and behavioral actions likely contributed to those programs' lower TRC and PAC ratios.

From the participants' perspective, EAI's portfolio achieved an exceptionally high level of cost-effectiveness, with a PCT ratio of 13.62. Three programs: CitySmart, C&I Custom, and Lighting and Appliances, largely drove the high participation cost ratios. The CitySmart program was especially notable for providing significant value to participants, achieving a PCT ratio of 118.59, meaning that for every dollar spent to participate in the program, customers receive $118.59 in value. CitySmart participants' significant uptake of the PC power management measure was a major factor in producing this result as this measure is very low cost for customers to implement and produces significant energy savings. Table 12 provides an overview of the portfolio cost-effectiveness metrics by program.

[24] This analysis did not include the two statewide programs in which EAI participates: AWP and EEA. These were evaluated independently.

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Table 12. Portfolio NTG Ratios by Program

Program	Net Energy Savings vs. Goals	Evaluated NTG	TRC Ratio	PAC Ratio	PCT Ratio
HES	377%	1.04	1.47	2.38	3.30
New Homes	5%	0.72	0.17	0.19	1.89
Lighting and Appliances	124%	0.51	3.62	4.52	19.13
CoolSaver[1]	299%	1.03	2.28	2.31	6.26
Small Business	467%	1.10	2.15	2.87	71.31
C&I Prescriptive	55%	0.99	1.86	3.17	9.09
C&I Custom	204%	0.92	2.52	2.38	24.71
CitySmart	167%	0.95	4.41	2.34	118.59
AES	161%	0.89	1.05	1.18	5.53
Res DLC	N/A[2]	1.0	3.09	2.21	N/A[3]
AILC	N/A[2]	1.0	2.47	1.79	N/A[3]
Manufactured Homes	106%	0.92	0.42	0.34	N/A[3]
Multifamily	170%	0.95	0.96	0.63	N/A[3]
Rewards	161%	1.0	0.49	0.45	N/A[3]
Portfolio Total	125%	0.91	2.18	2.41	13.62

[1] The CoolSaver achieved an NTG of 1.03 for residential and 1.02 for commercial.

[2] The Evaluation Team used stipulated, rather than calculated, NTG ratios for these programs.

[3] Because there are no costs to participants in these programs it is not possible to calculate a PCT ratio.

Factor 7: EM&V Procedures

Whether the programs and/or portfolio have EM&V procedures adequate to support program management and improvement, calculation of energy, demand, and revenue impacts, and resource planning decisions.

To assess Factor 7, we reviewed performance indicators including whether the EM&V Plan conformed to the Arkansas TRM and achieved IEM approval, whether the EM&V implementation followed an articulated EM&V plan and the extent to which EAI provided high quality and timely data and other support necessary to conduct EM&V. In 2013, we also assessed the allocation of EM&V resources for each program.

Below we summarize the 2013 EM&V procedures' compliance with each of these evaluation metrics.

- *The EM&V Plan conformed to the Arkansas TRM 3.0.* The Evaluation Team drew extensively on the Arkansas TRM to calculate deemed savings. However, as noted previously, in several cases we used data collected through primary research activities to replace parameter values in the TRM. This approach is consistent with direction provided by the IEM.

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- *The EM&V Plan was approved by the IEM.* The Evaluation Team prepared a comprehensive EM&V Plan for 2013 and submitted it to the IEM for review. We received several comments from the IEM regarding areas for refinement or additional detail needed. In most cases, the IEM requested greater detail in the description of EM&V activities, and wherever possible, the Evaluation Team has addressed these areas in this report. In two cases, the Evaluation Team was not able to address the IEM's recommendations, as follows.
  - The Evaluation Team was not able to increase the sample size of homes in the residential light logging study because meters had already been installed before receiving IEM feedback on the 2013 Plan. Adding to the sample size at that time would have been cost prohibitive.
  - Because we decided to assess NTG for the Lighting and Appliances program using a price response model approach, the Team did not conduct follow up interviews retailers in the program. As the Lighting and Appliances Program was designated to receive a condensed process evaluation and did not require retailer responses to calculate NTG, we determined that the cost of retailer interviews would not be a good use of EM&V resources, given limited use for the results.
  - The Evaluation Team calculated NTG, rather than applying the APSC-stipulated NTG of 0.8 for the New Homes program.
  - The Evaluation Team was not able to analyze market conditions related to storage/sales of legacy incandescent T-12 lighting fixtures.
- EM&V Implementation followed the EM&V Plan. While the EM&V Plan was approved by the IEM for all programs and conformed to the Arkansas TRM, there were several instances where the Evaluation Team had to vary EM&V activities from those articulated in the plan.
  - To address concerns about measure leakage from upstream lighting programs, the Evaluation Team developed a survey and analysis to estimate the percentage of lamps purchased by households not is EAI's territory.
  - Rather than using a control group in its billing analysis for HES, the Evaluation Team accounted for non-programmatic changes in household energy use by using a large sample of 2,700 homes, which at a collective level, tends to balance out individual household changes. The Team plans to repeat its billing analysis using a control group in 2014.
  - Although not specifically identified in the 2013 Plan, the Evaluation Team undertook site visits to perform verification and measurement for the Lighting and Appliances, Small Business and CitySmart programs.
  - Although not specifically identified in the 2013 Plan, the Evaluation Team undertook participant surveys for the Res DLC and AILC programs and nonparticipant surveys for the AILC program.
  - The Evaluation was not able to achieve the intended number of survey completes for the CoolSaver residential and commercial participant survey (achieving 130 of 140 planned completes), the combined commercial program participant survey (achieving 131 of 210

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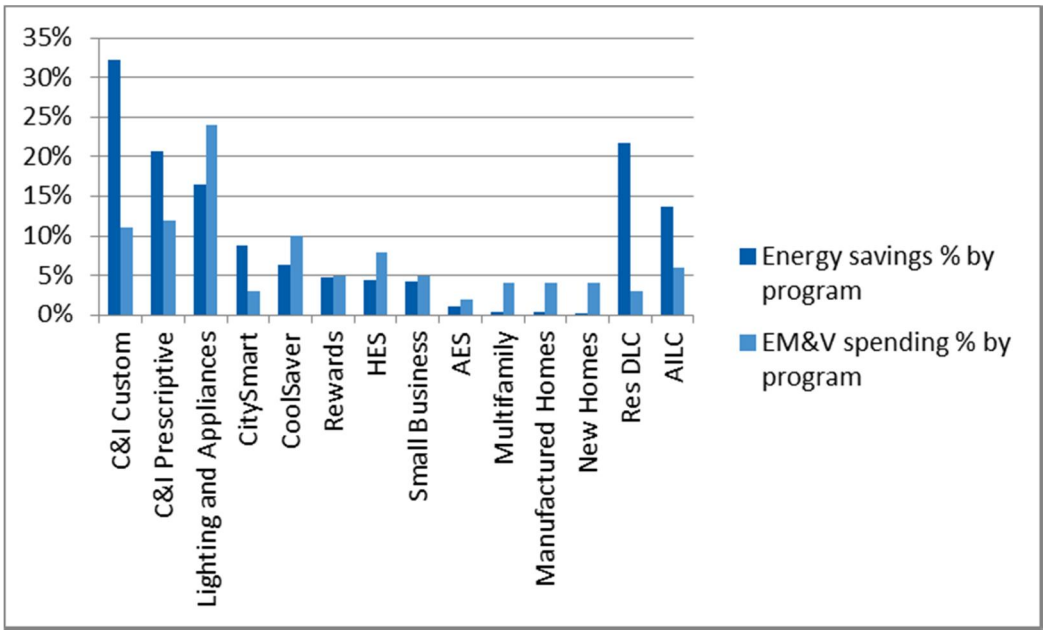
planned completes), AILC participant survey (achieving 50 of 70 planned completes), or the Multifamily and Manufactured Homes participant survey (achieving 107 of 140 planned completes). These were primarily due to insufficient sample sizes to obtain the desired totals.

- EAI provided timely/high quality data and support to the EM&V process. As discussed above, EAI and its implementers were generally responsive to the Evaluation Team's data requests, and accessing data through the ArchEE database was straightforward and productive.

EM&V Resource allocation was consistent with program contributions to savings. To assess the appropriateness of EM&V resource allocation, we compared each program's contribution to overall portfolio savings to the cost of evaluating the program as a percentage of total EM&V spending. Figure 12 presents each program's relative contribution to savings compared to its relative cost to evaluate. The Lighting and Appliances Program entailed the largest portion of EM&V costs, due largely to completing several research and analysis tasks (i.e., light logging study, price response model, leakage study) for the 2013 evaluation, which were beyond normal evaluation activities. EAI's next two largest contributors to energy savings (C&I Custom and C&I Prescriptive) entailed the next largest portions of EM&V spending. Both of those programs gained some economies-of-scale, producing a high volume of savings from relatively few participants, thus this finding is not surprising. EAI's two demand response programs likewise contributed significant demand savings at a relatively low cost to evaluate. For EAI's remaining programs, EM&V costs generally aligned with their contribution to overall portfolio savings.

Figure 12. EM&V Resource Allocation Compared to Savings Contribution by Program



Energy savings % by program for the Res DLC and AILC programs represent demand savings.

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Portfolio-Level Recommendations

Update TRM parameter values.

The Evaluation Team conducted primary research (i.e., residential light logging, commercial light logging), which yielded Arkansas-specific values for several of the deemed parameter values in TRM 3.0. Since the values in the TRM are largely derived from research performed outside Arkansas, we recommend that the IEM update the TRM algorithms with the revised values outlined in Table 13.

Table 13. Recommended Updates to TRM Parameter Values

Measure	Action	TRM 3 Algorithm / Table	Parameter	TRM 3 Value	Recommended Value	Applicable Programs
Commercial Lighting	Change Value	Table 288	AOH for Office Buildings	3,737	3,227	C&I Prescriptive, Small Business, CitySmart
Commercial Lighting	Change Value	Table 288	CF for Office Buildings	0.77	0.50	C&I Prescriptive, Small Business, CitySmart
Anti-Sweat Heater Controls	Add to TRM	NA	All	NA	NA	C&I Prescriptive, Small Business, CitySmart
Residential Lighting	Change Values	Table 135	AOH	803.6 Indoor; 1132.3 Outdoor	2.17	L&A, Multifamily, Manufactured, HES
Residential Lighting	Change Values	Table 135	CF	9% Indoor; 0% Outdoor	10% Blended Location	L&A, Multifamily, Manufactured, HES
Residential Lighting	Change Values	Table 135	CF Peak Definition	Summer Months	June through August or June through September	L&A, Multifamily, Manufactured, HES
Residential Lighting	Change Values	Table 135	ISR (Retail)	0.86	0.926	L&A
Residential Lighting	Change Values	Table 135	IEF_E	1.14 Gas Heat; 0.43 Resistance Heat; 0.83 Heat Pump	1.10 Gas Heat w/AC; 0.83 Resistance Heat w/AC; 0.96 Heat Pump; 0.97 Heating Unknown	L&A, Multifamily, Manufactured, HES
Residential Lighting	Change Values	Table 135	IEF_D	1.53	1.25	L&A, Multifamily, Manufactured, HES
Residential Lighting	Change Values	Table 135	IEF_G	-0.0231	-0.0063	L&A, Multifamily, Manufactured, HES

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Update tracking procedures to ensure that complete and accurate data are collected as necessary for program evaluation.

In several programs, the Evaluation Team identified issues with tracking data. In all cases, we were able to locate missing data, then format and prepare it for analysis; however, these steps required expending additional financial and human resources. We identified the following primary issues:

- Misalignment of customer and measure records: Pertinent fields used to calculate savings should be found in measure level tracking data
- Use of inconsistent fields and field names: Unless the Evaluation Team specifically requests an additional field or changes to a field, each subsequent dataset should have the same layout and naming conventions as the previous dataset.
- Missing measure level savings, costs, and incentives: Measure level savings for each record are required for evaluation. Do not include project level savings as this can be confused for measure level savings.

While we recognize that the updates to the TRM 3.0 in September 2013 entailed collecting new data fields, some of which may not have been collected previously, we encourage EAI and its implementer to review the current data tracking systems to ensure they capture all necessary data to calculate TRM based savings in a consistent format, and to ensure that all fields contain accurate data that can be readily exported for evaluation purposes. Table 14 shows tracking system issues by program that should be updated.

Table 14. Identified Tracking System Issues

Program	Measure	Data Field	Application	Data Problem	2013 Evaluation
C&I Prescriptive	Lighting and Lighting Controls	Multiple Fields	Savings Calculation	Measures not separated in database	Adjusted savings based on engineering judgment
CitySmart	PC Power Manager	Equipment Type	Savings Calculation	Missing	Worked with implementer to resolve
Small Business	Exit Signs	AOH	Savings Calculation	Used TRM AOH for building type, not 8,760	Substituted 8,760 AOH
CoolSaver	Tune-Up	Multiple Fields	Savings Calculation	Need Additional Data to Refine Savings Estimate	Estimated Average Values
Home Energy Savings	Exit Signs	AOH	Savings Calculation	Used TRM AOH for building type, not 8,760	Substituted 8,760 AOH
	Multiple Measures	Multiple Fields	Savings Calculation	Erroneous Entries	Worked with implementer to resolve
Manufactured Homes	Lighting	Baseline Wattage	Savings Calculation	Missing	Used TRM 3.0 Deemed Value
	HVAC	Heating Type	Estimation of IEF	Missing	Used TRM 3.0 Deemed Value
	Faucet Aerators	Weather Zone	Savings Calculation	Missing	Mapped by Zip Code
	Showerheads	Weather Zone	Savings Calculation	Missing	Mapped by Zip Code

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Develop ways to enhance trade ally network.

Trade allies play a critical role, especially in the commercial sector, and with the elimination of EAIs commercial customer service representatives, trade allies will play an increasingly important role in generating program leads (see the C&I Custom and C&I Prescriptive programs' sections for details). Hosting networking events to foster ties between trade allies who provide diverse services as well as developing compelling marketing materials to assist trade ally communicate program legitimacy as well as benefits will aid in program participation.

Require participating nonresidential trade allies to attend yearly program updates training.

As program ambassadors, trade allies must clearly understand and be able to communicate program operations as well as benefits to customers. Requiring an annual program updates training will ensure trade allies are up-to-date on program participation requirements, eligible measures, and other operations nuances. In addition, annual update trainings are networking opportunities for trade allies and will decrease misconceptions about program operations as the more and less active trade allies discuss their program experiences.

Investigate primary cause of nonresidential trade ally drop-out rate.

Trade allies serve a vital role in the marketing and implementing many of EAI's commercial programs. In 2013, the Evaluation Team identified nearly one-third (28 of 80) of the trade allies in the network as inactive. To ensure sufficient trade allies are available to support the commercial programs, it is useful to determine not only what leads trade allies to view participation as beneficial, but also identify barriers to participation. The Evaluation Team recommends implementing nonparticipant trade ally interviews or surveys as part of its 2014 portfolio evaluation to explore this issue.

General Areas for Improvement

Address low nonparticipant awareness multi-pronged marketing.

Again in 2013, nonparticipant's demonstrated low awareness of commercial programs overall, and even lower recognition of programs by name. Nonresidential trade allies reported that one of the largest barriers to engaging customers is convincing them that the program offerings are legitimate. Additionally, while most commercial participants learned about programs through direct communications with a program representative or peer, most nonparticipants said they prefer to learn about programs through direct mail or other passive outreach approach. A targeted multi-media approach would reach a broad audience and inform them of programs and their associated benefits. To fully capture opportunities through both outreach tactics, send direct mail and then follow up with direct contact from implementer staff. This can also help increase the program's legitimacy and reduce customer skepticism about the program being "too good to be true."

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Evaluation Methodology

The Team's 2013 evaluation methodology drew on multiple data collection, review, and analysis methods. We conducted customized program-level evaluation activities but also captured economies of scale by capitalizing on similar tasks across multiple programs or customer sectors. As our evaluation is a joint effort between EAI and SWEPCO, we combined some data collection activities in order to be efficient and to determine any broadly applicable insights.

Comprehensiveness Factors

The Team's evaluation of EAI's programs included analyzing the programs' success in achieving the goals and objectives established by the *Comprehensiveness Checklist* at a portfolio level. The Team's evaluation of EAI's programs included analyzing the programs' success in achieving the goals and objectives established by the *Comprehensiveness Checklist* at a portfolio level.

Building off of the full 2012 evaluation of the *Comprehensiveness Checklist*, we focused the 2013 evaluation on new activities EAI implemented to enhance the portfolio's comprehensiveness or to address deficiencies identified in 2012. To facilitate this assessment, the Evaluation Team updated the comprehensiveness tool we developed in 2012 with new findings based on 2013 research. Where programs achieved high marks for comprehensiveness in 2012, and for programs that met the TRM Protocol C guidelines for a condensed process evaluation, the Team conducted a less rigorous comprehensiveness assessment in 2013, focusing on key areas identified for improvement or where the analysis is likely to provide useful guidance relative to 2015-2017 program planning. For Factor 2 (budgetary, management, and program delivery resources) and Factor 6 (cost-effectiveness), where results from 2012 do not necessarily carry over into 2013, the Evaluation Team assessed data regarding comprehensiveness factor achievement exclusively for the 2013 program year.

The Team reviewed our findings at a portfolio level – incorporating new and updated information for 2013 – and drew conclusions regarding EAI's performance in accomplishing the *Comprehensiveness Checklist* objectives. Similar to 2012, we used both qualitative and quantitative techniques as appropriate and drew on portfolio-level trends and preponderances to assess compliance with each factor, rather than on individual programs' specific accomplishments.

Surveys

The EM&V Plans that included survey data collection were designed to understand customers' awareness of EAI's energy saving programs, product installation rates, customer behavior and equipment use, satisfaction with program components, purchase considerations, barriers to participation, and demographic/organization characteristics. The Evaluation Team used surveys to inform both process and impact evaluations.

The Evaluation Team conducted 12 sets of telephone surveys with EAI customers and trade allies. The list of surveys for each corresponding program is outlined in Table 15.

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Table 15. EAI Surveys by Program

Survey Name	Targeted Completes	Actual Completes	Residential Lighting	HES	CoolSaver	Rewards	Res DLC	AILC	C&I Prescriptive	Small Business	C &I Custom	CitySmart	Agricultural Energy Solutions
Leakage*	NA	567	●										
HES Participants	72	75		●									
Multifamily & Manufactured Homes	140	107											
CoolSaver Participants (Res)	70	70			●								
CoolSaver Participants (Comm)	70	60			●								
CoolSaver Nonparticipants (Res)	70	70			●								
Rewards Participants	280	280				●							
Res DLC Participants	70	71					●						
AILC Participants* (Comm)	70	50						●					
AILC Nonparticipants (Comm)	70	76						●					
Combine Commercial Participants	280	131							●		●	●	●
Combine Commercial Nonparticipants	280	281							●		●	●	●
Small Business Participants	70	70								●			

* 242 respondents to this survey were EAI customers. The remaining were Arkansas residents but could be customers of any utility.

For programs undergoing a full process evaluation, the Evaluation Team designed surveys to address researchable questions and inform our understanding of customer awareness, product characteristics and use, satisfaction, time to receive rebates, purchasing considerations, demographics, behavior, and other metrics. As appropriate, these surveys included a battery of questions that informed the calculation of the NTG ratio and program realization rate. For consistency and to compare results over time, we used similar survey instruments to those implemented in the 2012 evaluation. We reviewed and updated each survey instrument as needed to account for program changes and address the 2012 recommendations.

For programs undergoing condensed process evaluations in 2013, the Evaluation Team designed surveys to capture year-over-year trends associated with program awareness, marketing effectiveness, barriers

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to participation, customer satisfaction, customer demographics, and other metrics. In addition to the trend questions, condensed surveys also included, where appropriate, a NTG battery.

Where possible, we used a single survey instrument for similar programs, with a branching system to address questions that were unique to each program.[25] Information we collected in customer surveys supported both process and impact evaluations.

Participant Surveys

With input from EAI and program implementer staff, the Team designed participant survey instruments for 12 programs. In cases where the program designs were similar, we designed survey instruments to address more than one program to achieve data collection objectives and included sample from both programs.

Nonparticipant Surveys

The Evaluation Team developed one nonparticipant survey targeting commercial customers. The data objectives from nonparticipants included understanding customers' program awareness levels, barriers to participation, and their interest in energy efficiency and conservation, as well as using the call as an opportunity to recruit participants for lighting metering site visits.

We used data collected through participant and nonparticipant surveys to support the process and impact evaluations.

Survey Sampling

The Evaluation Team obtained participation lists and general customer billing records from EAI. We then set survey completion quotas to achieve 90/10 confidence and precision levels for each survey. For programs with more than 200 participants, and for nonparticipant surveys, we selected a random sample from the entire participation list in order to complete the required number of surveys. In cases where the number of completed surveys was less than the desired target, we exhausted the maximum number of call attempts (five) for all sample points. The number of survey responses and our sampling method for each program are detailed above in Table 15.

The Evaluation Team analyzed survey results using SAS, IBM Survey Reporter (SPSS), or Microsoft Excel, depending on the dataset types and sizes and the types of required analytical outputs. We typically analyze small samples with open-ended questions using MS Excel (so we can visually inspect the responses side-by-side). We analyze larger samples yielding more tabular results with either SAS or SPSS Reports. The calculations and formula we used for individual program analytical techniques are described in the specific program sections.

Appendix A provides frequency tables for each survey, outlining the count and percent of each survey response. We included charting and descriptive analyses in the program report sections for items that

[25] In some cases, surveys captured information from both SWEPCO and EAI participants in similar programs.

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address research questions. Where segments warranted, we conducted cross-tabulation analysis, testing column proportions between groups. We tested statistically significant differences at the 95/5 and 90/10 confidence levels, highlighting only findings where testing met or exceeded the statistically significant threshold.

Impact Evaluation

To evaluate program impacts, the Evaluation Team adjusted program-reported gross savings using the information we gathered through engineering desk audits, on-site inspections and equipment metering, phone surveys, and project-level billing analysis. Where deemed savings were applied, we verified the appropriateness of savings algorithms and values from the Arkansas TRM. Where sampling was conducted, we designed a sampling plan expected to achieve a minimum precision of ±10% of the gross realized savings estimate, with 90% confidence, for each program.

The Evaluation Team carefully reviewed program tracking information for quality, completeness, the appropriateness of EAI's assumptions, and the approach to calculating savings. Through site visits and/or telephone surveys with a sample of participants, the Evaluation Team verified that claimed measures had been installed.

For each program and measure category, the Evaluation Team estimated energy savings and demand reduction, applying a verified gross savings adjustment to program-reported savings. For each program, we estimated a NTG ratio, which captured the portion of savings attributable to the program, factoring in savings adjustments from freeridership and spillover.

The following sections provide more detailed descriptions of our specific evaluation methodologies.

Database and Document Review

The Evaluation Team reviewed EAI's program tracking databases and other documentation to assess the quality of information and the presence of anomalous entries, outliers, duplicates, and missing values. This included a review of all data fields recommended in TRM 3.0 Protocol A, including:

- Verifying that all customer and vendor information needed to conduct primary research was available and complete.
- Ensuring that all measure-specific data included the necessary details in the right formats to enable impact evaluation.
- Verifying that all program cost and other tracking information required to calculate impacts and assess resource allocation were available and complete.
- Assessing marketing and outreach materials and activities.

We also reviewed savings calculation work papers for each rebated measure, paying particular attention to calculation procedures and documentation for savings estimates.

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For custom projects, we reviewed each application for the following information:

- *Equipment being replaced:* descriptions, schematics, performance data, and other supporting information.
- *New equipment installed:* descriptions, schematics, performance data, and other supporting information.
- *Savings calculation methodology:* parameter values used, assumptions, sources of the specifications, and correctness of calculations.

For measures not included in TRM 3.0, EAI provided the Evaluation Team with documentation of the energy-efficiency projects undertaken at a sample of sites. We reviewed the documentation, such as audit reports and savings calculation work papers, paying particular attention to the calculation procedures and savings estimate documentation. We also verified the appropriateness of EAI's analyses to calculate savings, as well as assumptions concerning participating facilities' structural attributes and operational characteristics.

Technical Reference Manual and Prescriptive Deemed Savings

The Arkansas TRM 3.0, which was developed and issued by the IEM in September 2013, sets forth protocols for EM&V activities. The IEM also provides technical guidance relative to the TRM and oversight of EM&V activities throughout the state. The Team conducted our evaluation activities in accordance with applicable TRM 3.0 provisions and under direction from the Arkansas IEM.

In estimating program impacts, the Team applied algorithms and inputs from TRM 3.0 where EAI's tracking database included the required inputs and where primary data were not available. In some cases, we substituted primary data for deemed parameter values or we used TRM Version 2.0 because the inputs required by Version 3.0 were not available.

As noted above, we collected some primary data in 2013, from which we have proposed changes to TRM parameter values. Most notably, these relate to residential and commercial lighting AOH.

On-Site Measure Installation Verification and Metering

The Evaluation Team performed on-site visits to accomplish three primary tasks:

- Verify that measures were installed correctly and function properly, and confirm operational characteristics such as temperature setpoints and operating hours.
- Install light loggers to verify the reported hours of operation.
- Collect physical data, such as cooling capacity or horsepower, and analyze the energy savings realized from the installed improvements and measures.
- Conduct interviews with facility personnel to obtain additional information about the installed system to supplement data from other sources.

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We performed these activities to inform savings calculations for the CitySmart, C&I Prescriptive, CoolSaver and Lighting and Appliances programs.

Commercial Projects

The Evaluation Team conducted 59 on-site verifications for projects that received incentives in 2013. The projects predominantly featured lighting retrofits, but also included the following measure types:

- Compressed air equipment retrofits
- Variable speed drives
- Industrial process equipment retrofits
- Industrial process operations and maintenance measures
- Reduced lighting power density (LPD) in new construction

At these site visits, we confirmed equipment installations at the appropriate quantities, gathered relevant nameplate equipment efficiency data, and characterized the measure operational parameters, such as hours of operation.

Residential Lighting Visits

In 2013, the Evaluation Team performed a residential lighting study that involved long-term (approximately six months) metering in 75 homes (68 homes in EAI territory) in order to collect data on lamp saturation by type and HOU by room type.[26]

Leakage

The Evaluation Team used an upstream model in a geographic information system (GIS) to estimate the leakage of program lighting products to consumers outside the utility territory. The approach involved overlaying U.S. Census Bureau block points, utility territories, and concentric drive time polygons around store locations.

We allocated sales percentages for each store category based on responses from a statewide residential survey focused on assessing customers' preferred locations for light bulb purchases and the amount of time it takes customers to drive to those locations. Specifically, the Team allocated 16% of sales to blocks less than a five-minute drive from the store, 39% of sales to blocks between a five-minute and 10-minute drive from the store, 13% of sales to blocks between a 10-minute and 15-minute drive from the store, etc.

The Team calculated the overall leakage rate by summarizing sales for blocks inside versus outside the utility territory.

[26] The statewide sample includes 63 homes in EIA's territory and 12 homes in SWEPCO's territory.

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Tune-Up Savings Calculation Methodology

The 2012 evaluation report noted that CLEAResult had documented thousands of contractor pre- and post-tune-up efficiency measurements and recommended using these measurements to assess savings impacts for future evaluations. The 2013 program required only post-tune-up measurements so the Team investigated two savings analysis methodologies:

1. Use of the TRM savings methodology
2. Use of previous program (2012) tune-up data

We found the TRM methodology does not provide savings estimates that include the benefit of various cleaning measures. We aimed to use the TRM algorithm but to update the efficiency loss (EL) estimates with EL values calculated from the CoolSaver Program 2012 M&V measurements. To calculate savings from 2013 tune-ups, the Team performed the following key research activities:

- Comparison of qualitative tune-up work performed for systems in 2012 and 2013;
- On-site inspection to verify tune-up work was performed;
- On-site testing to confirm accuracy of contractor measurements;
- Engineering review of EER estimates from contractor data;
- Engineering review of capacity and EER normalization techniques;
- Applicability of the equivalent full load hour (EFLH) values in the TRM;
- Confirm calculated EL values are accurate; and
- Confirm savings algorithm for heat pumps in heating mode.

The purpose of these research activities was to gain confidence in the EL estimates from data collected in 2012 and to confirm applicability of the 2012 data to tune-ups performed in 2013. The details of findings from each of these research activities are described in the CoolSaver Program section of this report. Our review of the TRM and the findings and conclusions from these research activities result in new EL values that differ from those listed in the TRM. These values are provided in Table 16.

Table 16. Measured Efficiency Change from a CoolSaver Tune-Up

Measure	EL %
Any refrigerant adjustment with all other corrective measures	16.5%
All corrective measures but no refrigerant charge adjustment	8.1%

Source: Contractors 2012 CoolSaver pre- and post-tune-up measurements

Impact Evaluation Sampling

The Team used random sampling for multiple facets of our evaluation, including on-site measure verification, short- and long-term metering, and participant and trade ally surveys. Where feasible, we designed samples to achieve 90/10 confidence and precision levels. For estimating verified installation rates, we generally considered a sample of between 70 and 75 respondents adequate to meet this

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criterion. In practice, program participation and cooperation rates and the timing of projects sometimes made this precision impossible (these cases are noted where applicable).

For estimating parameter values, such as AOH for commercial lighting, we will continue to extend our sample sizes with research conducted in 2014, so that our final precision and confidence will extend beyond 90/10. As of 2013, we have obtained sufficient data from light metering in office locations that we have met the 90/10 criterion and are recommending a change to the TRM AOH value for that building type. We note that it is not necessary to achieve 90/10 at the measure level to achieve 90/10 at the program level and, concomitantly, achieving 90/10 at the program level ensures that the portfolio precision will be better than 90/10.

Calculation Spreadsheets

CLEAResult developed calculation spreadsheets to analyze energy savings for a variety of measures, such air compressor retrofits, variable frequency drives, and injection molding barrel insulation blankets. Calculation spreadsheets require relevant parameter inputs such as quantity and baseline and retrofit power consumption. From these data, CLEAResult used programmed algorithms to estimate energy savings. For each spreadsheet, the Evaluation Team reviewed input requirements and output estimates and determined if the approach was reasonable. Where applicable, we updated calculations using on-site verification data, spot measurements, and M&V data provided by CLEAResult.

HES Billing Analysis

We conducted a statistical billing analysis of HES program impacts to determine gross realized savings ratios for measures installed from January 2011 through December 2012.[27] The billing analysis estimated the average reduction in energy bills as a result of participation in the program and the resulting installation of efficiency measures. We applied a realization rate from this analysis to measures installed in 2013. We noted, however, that the measure mix in 2013 was substantially different than in the prior two years. Because of this, we applied the realization rate only to insulation measures. Other measures received the TRM value.

The Team included customers in the billing analysis that received major measures; namely, central air conditioner (CAC) replacement, insulation measures, heat pumps, and duct sealing. In 2011 and 2012, 5,506 participants received major measures. To estimate HES energy savings resulting from the program, the Evaluation Team applied the results of a pre- and post-installation combined conditional savings analysis (CSA). The CSA, fixed-effects modeling used pooled monthly time-series (i.e. *panel*) billing data corrected for differences between participants in pre- and post-installation weather conditions and in consumption by including a separate intercept for each participant. This modeling approach ensured modeled savings estimates would not be skewed by unusually high-usage or low-usage participants.

[27] The Evaluation Team used billing analyses for both the HES and Rewards programs. To eliminate double counted savings, the Team removed savings from Rewards participants that also participated in other EAI programs.

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Net-to-Gross Analysis

According to the TRM 3.0, there are five approaches for determining the NTG ratio:

1. *Self-reporting surveys:* participants and nonparticipants without independent verification report information.
2. *Enhanced self-reporting surveys:* self-reporting surveys combined with interviews and independent documentation review and analysis. This may also include an analysis of market-based sales data.
3. *Econometric methods:* statistical models used to compare participant and nonparticipant energy and demand patterns. These models often include survey inputs and other non-program-related factors such as weather and energy costs (rates).
4. *Deemed NTG ratios:* a NTG ratio estimated using information available from evaluations of similar programs.
5. *Stipulation of NTG ratios:* a stipulated NTG ratio may be appropriate when the expense of the NTG analysis and the uncertainty of the results are considered significant barriers.

The Evaluation Team followed one of the above accepted approaches for determining the NTG for each of the programs we evaluated.

The Evaluation Team used a combination of data collection and analytical methods to determine NTG ratios for EAI's programs. We conducted participant and nonparticipant surveys, as well as participating contractor interviews. While we relied on a different set of surveys and interviews for each individual program evaluation, the Evaluation Team's overall approach to calculating NTG was relatively consistent across all programs.

Price Response Model

The Evaluation Team used an econometric price response model to develop freeridership ratios for EAI's Lighting and Appliances Program. Demand elasticity modeling is based on the same economic principle driving program design: that a change in price and promotion generates a change in quantity sold (i.e., upstream markdown approach). Demand elasticity modeling uses sales and promotion information to:

- Quantify the relationship of price and promotion to sales (elasticity)
- Determine the likely level of sales without the program's intervention (baseline sales)
- Estimate freeridership by comparing modeled baseline sales with actual sales

The model uses program data on bulb prices, promotional activity, the number of bulbs purchased, and bulb and retailer characteristics to estimate freeridership.

Data Collection

For several programs, the Evaluation Team used multiple data collection techniques to inform NTG ratios. Table 17 provides an overview of the data we analyzed to calculate NTG ratios for each EAI program. Details on each data collection technique are provided below the table. Details on the price

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response modeling methodology are provided in the Residential Lighting and Appliances Program section.

Table 17. Net-to-Gross Data Collection Methods

Program	Participant Surveys	Nonparticipant Surveys	Trade Ally Surveys and/or Interviews	Price Response Model/Sales Data
Lighting and Appliances				●
HES	●		●	
New Homes	●			
CoolSaver	●	●		
C&I Prescriptive	●	●		
Small Business	●	●		
C&I Custom	●	●		
CitySmart	●	●		
AES	●	●		
Multifamily	●			
Manufactured Homes	●			

As demand-response programs have no freeridership, Res DLC and AILC are not included in NTG calculations.

Participant Surveys

For each program that included participant surveys for the NTG calculations, the Evaluation Team included survey question batteries similar to those used in 2012. We identified customers as freeriders if they simultaneously met the following criteria:

- They were already planning to purchase and install the measure before learning about the program, AND
- Their budget could have accommodated the full cost of the measure in absence of the program incentive, AND
- They would have installed or performed a measure providing the same or a greater level of efficiency in absence of the program AND they would have installed it or had it performed within the same year in absence of the program.

For participants who indicated that their contractor made the participation decision, we applied the contractor's estimate of freeridership. For respondents who indicated they made the decision jointly with the contractor, we used the average of the contractor's and respondent's estimates of freeridership. We did not adjust the freeridership estimate for respondents who indicated that they made the decision to participate without any contractor influence.

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Trade Ally and Contractor Interviews

The Evaluation Team interviewed trade allies and contractors for some programs where contractors could have played a key role in the participation decisions. Similar to 2012, we focused these interview questions to measure the program's influence on high-efficiency equipment installation and services.

We compared the resulting NTG estimates against those derived from participant surveys and, where appropriate, combined the results to adjust the final freeridership values.

As specified in the 2013 Energy-Efficiency Portfolio Evaluation Plan, we developed a combined commercial trade ally interview guide which was administered to commercial trade allies that participated in multiple commercial programs as well as provided services to customers in both EAI and SWEPCO territories. In total, we spoke with 20 EAI trade allies who provided services through the C&I Prescriptive, C&I Custom, CitySmart, and Small Business Programs. Results are reported in aggregate.

In addition, the Evaluation Team interviewed five participating trade allies from the HES Program and seven from the New Homes Program.

Nonparticipant Surveys

For evaluations that included surveys of nonparticipating customers, the Evaluation Team used a battery of questions, similar to those described above, to assess what the installations of program measures would have been without program assistance. We used the results of these questions to calculate nonparticipant spillover, which is where a program influenced nonparticipants to install energy-efficiency measures covered by the program. The Evaluation Team combined this information with the information we derived from the other surveys and interviews to develop final NTG ratios.

NTG Calculation

For most programs,[28] the Evaluation Team calculated a NTG ratio based on estimates of freeridership and spillover. We calculate net savings by multiplying the ratio determined from the equation below by the gross program savings:

$$NTG = 1 - Freeridership + Spillover$$

Freeridership Calculation Method

The Evaluation Team estimated freeridership based on four general question categories: prior plans for measure installation, available budget, program influence, and stated intent. We decided on the best method for determining NTG based on a combination of the following two approaches:

[28] For four programs, the Evaluation Team used a NTG value based on secondary research of similar programs in other jurisdictions, because of low program savings goals or low participation. These four programs were: AES, New Homes, Multifamily Solutions, and Manufactured Homes.

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1. The method outlined by Research Into Action for the Energy Trust of Oregon in their 2006 document *Free-Ridership and Spillover,* and
2. The standardized methods outlined by PA Consulting in 2003.[29]

The Evaluation Team chose these approaches because they are simple, transparent, relatively unbiased, and can be applied uniformly across all programs and markets. In addition, the methods are not overly burdensome to employ, and can therefore be incorporated directly with ongoing survey activities, eliminating the need to conduct costly secondary survey efforts.

Based on individual responses, we divided respondents into two groups:

1. Full freeriders (100%) – those participants who would have installed the same energy-efficiency measures in the absence of the program.
2. Non-freeriders (0%) – those participants who would not have installed any of the energy-efficient measures within one year of program participation.

In keeping with the Arkansas TRM, we did not include partial freeriders in the analysis. Every respondent was either classified as a full freerider (100%) or a non-freerider (0%). We combined all the respondent-specific freeridership rates to determine the overall freeridership for each program.

To be classified as a full freerider, respondents must simultaneously meet the following three criteria:

1. Indicate the presence of specific pre-existing plans to purchase or install the measure prior to learning about the program.
2. Indicate that their budget could have accommodated the full cost of the measure.
3. Indicate that in the absence of the program, they would have taken the same action as they did through the program within one year.

We will combine all the respondent-specific freeridership rates to determine the overall amount of freeridership for a program.

Combining Participant and Contractor Estimates

For participants who indicated that their contractor made the decision to participate, we applied the contractor's estimate of freeridership. For respondents who indicated they made the decision jointly with the contractor, we averaged the contractor and respondent estimates of freeridership. We did not adjust the freeridership estimate for respondents who indicated that they made the decision to participate without any contractor influence.

[29] PA Consulting. Standardized Methods for Free-Ridership and Spillover Evaluation—Task 5 Final Report. Submitted June 16, 2003.

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Spillover

Participant Spillover

Spillover is additional energy-efficiency actions taken by participating customers due to the influence of the program, but in the absence of direct program assistance. As with freeridership, our method of estimating spillover is simple, transparent, relatively unbiased, and can be applied uniformly across all programs and markets. For this method, we relied on three general question categories: installations of additional measures, absence of incentives, and program influence. Table 18 presents these generic questions, response categories, and classifications.

Table 18. Spillover Questions

Question Asked	Response Categories	Classification
Have you installed any additional energy-efficient measures? If so, how many?	Yes/No	Installation of additional measures
Did you receive an incentive, rebate, or any other type of assistance from EAI to install these other measures?	Yes/No	Absence of incentives
How influential was the program on your decision to install these other measures?	5-point scale	Program influence

Note: The questions presented are generic examples of the types of questions we asked. We tailored the actual questions to each program and respondent group.

The Evaluation Team investigated the following two distinct forms of spillover:

1. *Like spillover:* a conservative approach to estimating spillover that consists of asking participating customers about actions taken or measures installed outside the program that are exactly the same type and efficiency as those actions or measures sponsored by the program. This can be assessed for both participants and nonparticipants.
2. *Non-like spillover:* the category of equipment installed outside the program that is not exactly the same type and efficiency as the equipment installed through the program. This can only be assessed for participants, and was only assessed qualitatively.

Savings for like spillover are generally easy to calculate because respondents can provide the quantity of installed equipment based on a comparison with the equipment they installed through the program. In addition, the efficiency level of equipment is specified as the same as the equipment installed through the program.

It is more complex to determine savings from non-like spillover, since both quantity and efficiency must be ascertained solely from a telephone survey. However, without follow-up inspections in homes or facilities where customers reported spillover, it is impossible to determine whether the measures are program eligible. Only program-eligible measures should be used to estimate the potential savings attributed to spillover. Therefore, we did not quantify savings attributable to non-like spillover.

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Trade Ally Spillover

Because trade allies are typically best able to identify program-induced spillover, for some programs the Evaluation Team used data collected through trade ally surveys to estimate spillover. Specifically, we asked trade allies whether they had performed program-like services outside of the program due to the influence of the program. In order for a service to be designated as spillover: 1) it must have been performed in the past year, 2) neither the trade ally nor their customer could have received a program incentive for the purchase, 3) the service must have been a program-like service, and 4) the trade ally must have identified the program as either important or somewhat important to the decision to perform the service.[30]

Nonparticipant Spillover

Nonparticipant spillover refers to energy-efficient measures installed by program nonparticipants due to the program's influence. We asked nonparticipating business customers in the EAI service territory several questions to assess nonparticipant like spillover effects; specifically, we attempted to determine whether program nonparticipants: 1) had heard of any EAI programs or rebates, 2) had purchased or installed specific equipment or services in their home in the past year and if any were ENERGY STAR-qualified, 3) had believed that the purchased products or services were eligible for a discount or rebate through an EAI program and had applied for or received a rebate for the product, and 4) if their knowledge of EAI energy-efficiency programs had influenced their decision about which equipment to purchase or service to receive.

Process Evaluation

The Team began our process evaluation by determining which of EAI's program's qualified for full process evaluations under TRM 3.0 Protocol C, for which a program must:

- Be new or modified
- Have not had a process evaluation in the funding cycle
- Be not achieving goals or goal achievement is slower than expected
- Be not achieving expected participation
- Be experiencing operational challenges
- Be not as cost-effective as expected
- Suffer from negative feedback or low customer satisfaction

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30 The Team asked trade allies to identify the extent to which the program influenced their non-program sales. Trade allies rated the program's influence using a scale of 0 to 10, where 0 indicated being *not at all important* and 10 indicated being *extremely important.* We considered responses of 0 through 3 as *not important* (0% spillover), responses of 4 through 6 as *somewhat important* (50% spillover), and responses of 7 through 10 as *important* (100% spillover).

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We tempered our analysis by carefully considering the EM&V costs compared to EAI's overall program spending and each program's relative savings. We also looked at the relative importance of each criterion under Protocol C to determine areas of special focus for the 2013 evaluation. Where otherwise successful programs failed to achieve one of the Protocol C criteria, depending upon the importance of that criterion in the overall portfolio, we conducted a condensed evaluation but included a special focus on that Protocol C requirement. We vetted each of our process evaluation assignments and our planned scope of activities for each type of evaluation with the IEM.

Based the criteria, presented in Protocol C, the Evaluation Team assigned full process evaluations for six programs and condensed evaluations for eight programs in EAI's energy-efficiency portfolio (see Table 19).

Table 19. Type of Process Evaluation Determined by TRM Protocol C

Program	New or Modified	Evaluation Conducted in Funding Cycle?	Savings Goal Achieved?	Participation Goal Achieved?	Operational Challenges?	Cost-Effective?	Satisfaction High?	Full/ Condensed Evaluation Recommended
HES	Y	Y	Y	N	N	Y	Y	F
New Homes	N	Y	N	N	N	N	Y	F
Lighting and Appliances	N	Y	Y	Y	N	Y	Y	C
CoolSaver	N	Y	Y	N	N	Y	Y	C*
Small Business	N	Y	Y	N	N	Y	Y	C*
C&I Prescriptive	Y	Y	N	N	N	Y	Y	F
C&I Custom	N	Y	Y	N	N	N	Y	F
CitySmart	N	Y	Y	N	N	Y	Y	C*
AES	N	Y	N	N	N	N	Y	F
Res DLC	N	Y	N	N	N	Y	Y	F
Agriculture Irrigation Load Control	N	Y	N	N	N	N	Y	F
Manufactured Homes	N	Y	Y	Y	N	N	Y	C*
Multifamily	N	Y	Y	Y	N	Y	Y	C
Rewards	N	Y	Y	Y	N	N	Y	F

Key: Y=Yes; N=No; F=full process evaluation; C=condensed process evaluation; C*=condensed process evaluation with specific focus.

We relied on key researchable questions to determine process evaluation areas of investigation, and to guide our assessment of the program's performance in critical program areas, such as program design, customer satisfaction, administrative processes, and marketing. The Team relied on data collected through utility staff and implementer interviews, trade ally interviews, participant and nonparticipant

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surveys, and a review of program materials against industry practices. Each of these data collection techniques is described in the following sections.

For the condensed process evaluations, the Team assessed changes in program design, operations, delivery, and marketing, as well as how the programs preformed against the 2013 savings and participation goals. Condensed process evaluations were limited to the following research activities:

- Monitoring program activities and changes
- End-of-year interviews with key program staff
- Condensed surveys (NTG and trend questions only), if appropriate

In addition to the activities listed above, full process evaluations included:

- Data collection interviews with program and implementer staff during the third quarter
- Full program surveys or interviews, as appropriate (with participants, nonparticipants, and/or trade allies)
- Review of new program and marketing materials, if appropriate

Program and Implementation Staff Interviews

The Evaluation Team conducted one of two types of interviews with program and implementation staff, depending on whether the process evaluation was full or condensed.

- *Data Collection Interviews.* For programs that underwent a full process evaluation, program leads conducted data collection interviews during the third quarter of 2013. Our objectives were to follow up with EAI program staff and implementation staff on any activities that addressed the 2012 recommendations and to understand any changes to the program's design, operations, marketing, and/or delivery.
- *Year-End Interviews.* At end of the evaluation cycle, all program process leads conducted a one-on-one telephone interview with the EAI staff responsible for each program. Our objectives for the end-of-year discussion were to monitor the progress made toward meeting the APSC *Comprehensiveness* Checklist and other program and portfolio goals, as well as to share high-level observations and findings with key program staff and gather any additional data to help the Evaluation Team understand program activities during the year.

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Customer Surveys

The information we collected through customer surveys supported both the process and impact evaluations, including informing the NTG analysis. Depending on the each program's needs and each survey instruments' objectives, the Evaluation Team developed surveys to:

- Capture year-over-year trends associated with program awareness, marketing effectiveness, barriers to participation, and customer satisfaction
- Inform our understanding of customer awareness, product characteristics and use, satisfaction, time to receive rebates, purchase considerations, demographics, behavior regarding the installation of energy-saving devices, and other metrics
- Verify measure installations
- Facilitate the NTG analysis (specifically to assess freeridership and spillover)

Our survey methodology and use of surveys to inform various analyses for each program are described in the individual program section and in other sections of this report. Table 15 above provided an overview of the Evaluation Team's data collection activities (including surveys) and sample sizes. We present detailed survey results in Appendix A.

Trade Ally Interviews

The Evaluation Team interviewed participating trade allies to inform our understanding of the program implementation effectiveness and the NTG analysis.

As specified in the 2013 *Energy-Efficiency Portfolio Evaluation Plan,* we developed a combined commercial trade ally interview guide, which we administered to commercial trade allies that participated in multiple commercial programs, as well as to those that provided services to customers in both EAI and SWEPCO territories. We also interviewed trade allies that provided RSOP services. Table 15 above provided an overview of the Evaluation Team's data collection activities (including trade ally interviews) and sample sizes.

Applying the research instruments from 2012, we used a semi-customized approach to trade ally surveys and interviews to facilitate comparing responses across years and capturing economies-of-scale.

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Materials Review

The Evaluation Team concentrated our 2013 materials review on updated critical program documents that were the subject of 2012 recommendations, as well as on new 2013 materials for programs undergoing a full process evaluation. Specific materials included program manuals, marketing plans and metrics, marketing materials, training protocols, and website content. This review was guided by the following research questions:

- Do the updates of the program material cover all necessary topics to guide new and existing stakeholders and participants in program implementation?
- Do the updates to the program and marketing material satisfy the recommendations outlined in the 2012 *Energy-Efficiency Portfolio Evaluation Report*?

We assessed each specific document based on these factors and provided our findings at both a program and a portfolio level.

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Home Energy Solutions Program

Through the HES Program, EAI offers multiple participation opportunities for customers in its service territory who own or rent single-family homes, as well as for customers who live in multifamily complexes with four or fewer units. The program is designed to help customers achieve significant long-term electric savings through the use of participating installation trade allies and local Home Energy Consultants (HECs), who perform home energy assessments. CLEAResult implements the program for EAI including training and processing payments for trade allies, approving project work orders, and marketing the program.

EAI customers have three entry points to the program. Customers may: 1) directly contact participating trade allies to install eligible measures, 2) receive an energy survey from an HEC that results in a list of recommended measures and eligible trade allies, or 3) receive a comprehensive assessment from a HEC that results in a list of recommended energy-efficiency upgrades and eligible trade allies to install the recommended measures. During 2013, program delivery changed slightly, with more contractors offering assessments and installations in one visit, making it less complicated and less expensive for customers.

All participants receive coupons that offset the initial cost of eligible measure installations. Participants are also eligible for coupons that offset the initial cost of the survey or assessment. EAI pays the coupon in one of two ways:

3. They pay the trade ally, who deducts the incentive from the customer's invoice at the time of the survey, assessment, or measure installation, or
4. When a customer installs two or more approved measures, the trade ally submits the measure coupon and other documentation to CLEAResult for determining if the customer or contractor is due a bonus. CLEAResult then sends the incentive to either the contractor or customer.

Table 20 outlines the HES Program incentive structure.

Table 20. HES Program Customer Incentive Structure

Measure	Incentive/Coupon Amount (Off Invoice)	Bonus Incentives/Coupons
Tier I Survey	$75	Up to $75 upon verification and installation of two or more measures within six months of the survey.
Tier 2 Assessment	$300	Up to $200 upon verification and installation of two or more measures within six months of the assessment.
Ceiling Insulation	Up to $0.23/sq. ft.	Up to $0.22/sq. ft. when combined with air sealing.
Air Sealing	$0.25/cfm 50 reduced	N/A
Wall Insulation	$0.60 - $0.90/sq. ft.	N/A
Duct Sealing	Incentive based on final leakage rate	N/A
AC Replacement	Up to $593/unit	• AC Bundle 1: 2x AC replacement coupon value deducted from

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Measure	Incentive/Coupon Amount (Off Invoice)	Bonus Incentives/Coupons
		contractor invoice when duct sealing is performed • $150 deducted from the contractor invoice if an air handler with an ECM is installed
Heat Pump Replacement	Up to $809/unit	• Heat Pump Bundle 1: 2X heat pump replacement coupon value deducted from contractor invoice when duct sealing is performed • $150 deducted from the contractor invoice if an air handler with an ECM is installed
Customer Savings Bonus 1	15% of total implemented measure incentive value	• Complete a Tier 2 Assessment and implement enough recommended measures to achieve projected energy savings of 15% to 29%
Customer Savings Bonus 2	30% of total implemented measure incentive value	• Complete a Tier 2 Assessment and implement enough recommended measures to achieve projected energy savings of 30% or more

As listed in Table 20, participating customers are eligible for tiered bonus coupons based on achieving savings reductions of 15% or 30%. Customers who receive a Tier 2 Assessment and achieve 15% electric savings are eligible for a coupon for up to an additional 15% of the total implemented measure incentive. Customers who receive a Tier 2 Assessment and achieve 30% electric savings are eligible for a coupon for up to 30% of the total implemented measure incentive.

All customers who participate in either a survey or assessment receive direct installation measures, including up to six 60-watt-equivalent CFLs and one smart power strip if recommended by the HEC during the inspection. Customers with electric hot water heaters are also eligible for domestic hot water measures including:

- Low-flow faucet aerators
- Low-flow showerhead
- Water heater jacket
- Water heater pipe insulation

EAI also provides program contractors (HECs and installation trade allies) with bonuses to encourage customers to install eligible measures (Table 21).

Table 21. HES Program Trade Ally Incentive Structure

Measure	Incentive	Description
HEC Bonus	$100	Bonus sent to HEC after customer has received assessment and installed two or more measures.
Contractor Bonus	25% of total incentive	Bonus sent to trade ally after customer has installed air sealing, duct sealing, and/or wall insulation.

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Program Status Overview

Status of 2012 Evaluation Recommendations

The HES Program more than doubled its evaluated energy and demand savings compared to 2012, and exceeded all of its 2013 targets, achieving 377% of its energy-savings goal, 249% of its demand-reduction target, and 163% of its participation goal. Table 22 provides a summary of these accomplishments.

Table 22. HES 2013 Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	4,011	15,118	377%
Demand Savings (MW)*	2.27	5.67	249%
Participation (customers)**	3,600	5,883	163%
Budget	$4,329,741	$7,751,972	179%

* The evaluated net MWh and MW values are presented excluding line losses.

** The Evaluation Team defined an HES participant as any EAI customer who received a direct install measure, coupon measure or both.

Of the 6,431 customers that participated in the HES Program in 2013, 92% installed direct install measures, coupon measures, or both (5,883 participants).

Table 23. 2013 HES Participation by Category

	Number of Participants	% of Total
Direct Install Measures Only	1,284	20%
Coupon Measures Only	2,358	37%
Coupon and Direct Install Measures	2,243	35%
Evaluation Only	546	8%
Total	6,431	100%

EAI made two programmatic changes in 2013. First, EAI removed the commissioning bonus for contractors, as it had no associated savings. Second, in an effort to increase program activity, the program implementer recruited trade allies from outside the state who had performed successfully in similar programs. These new trade allies offered assessments and installations in one visit, reducing the time required and the overall cost to customers. Both EAI and the implementer recognized that this change influenced a number of existing trade allies to adopt the one visit method, which contributed to an increase in the number of participants who followed through with installations and helped contribute to the program's overall success in 2013.

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Status of 2012 Evaluation Recommendations

Table 24 lists the status of each of the HES Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed all of the 2012 recommendations during the 2013 program year.

Table 24. 2013 Status of 2012 HES Program Recommendations

2012 Recommendation	2013 Status
Consider sending follow-up postcards to participants to help them link their coupon incentive and/or assessment to the program and EAI. The postcard should thank them for participating, reiterate the program benefits, note the services provided (i.e., free direct install measures and incentive coupons), and cross-promote other relevant programs.	*Completed.* Program staff sent two rounds of mailings, one at mid-year and one at end of year. However, no customers had provided feedback via the postcards as of January 2014.
Continue leveraging complementary programs by expanding cross-promotional activities, such as through existing EAI and partner social media channels, by tagging participants in posts, and by showcasing successful case studies.	*Completed.* Program staff created cases studies and cross-promotional materials. In addition, staff plans to develop testimonials pending approval.
Enhance cross-promotional materials by adding a full description of the HES Program and the benefits of complementary programs, such as CoolSaver.	*Completed.* Program staff updated materials to include a full program description and benefits of complementary programs.
Continue reaching out to customers through direct mail, as well as leveraging one-on-one and social networking outreach opportunities such as Rotary and civic clubs and HOA meetings.	*Completed.* Program staff conducted three direct mail campaigns as well as a number of community program presentations.
To ensure that targeted messaging is consistent and cutting edge, consider narrowing the benefits to the top motivators and targeting the materials based on the latest survey research.	*Completed.* Program staff updated messaging on the program materials.
Update the trade ally training and marketing to emphasize HES Program participation benefits, including leveraging the EAI partnership and the financial benefit of providing customers with program coupons.	*Completed.* Program staff revised the training materials as recommended.
Solicit feedback from trade allies on what they perceive as participation benefits and what types of support EAI could provide to help them better sell and deliver the program.	*Completed.* Program staff conducted a post-training survey with trade allies.
Solicit trade ally feedback on what marketing collateral they find most effective.	
Continue to work toward providing trade allies with yard signs, ad print templates, and additional marketing	*Completed.* Program staff provided trade allies with co-branded marketing materials.

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2012 Recommendation	2013 Status
materials such as web banners, html email templates, social media materials, and other web elements.	
Consider tracking the types of materials trade allies request most frequently.	*Completed.* Program staff track the requested co-branded materials by trade allies.
Emphasize hands-on software training that enables HECs to practice working with the required software (Optimiser) and using it to encourage customers to install recommended measures.	*Completed.* The software trainer works individually with HECs who need additional assistance after attending the general software training. In addition, staff updated the software to make it easier to learn and use.
Review the customer-facing software outputs to ensure they are clear, understandable, and adequately inform and motivate customers to take action.	*Completed.* Program staff revised the customer report to increase understandability and provide specific prioritized recommendations.
Create a unique identifier for each customer, separate from their account number, so that savings from coupon and direct install measures can easily be matched; the 2012 program data did not contain unique identifiers.	*Completed.* Program staff revised the database to assign a unique number to each customer record.
Monitor the transfer from QuickBase to the new database to ensure that all necessary program data are captured.	*Completed.* Program staff monitored the transition and all program data was captured appropriately.
Investigate the new database's compatibility with Optimizer and the options available to streamline measure installation reporting and tracking, including direct installation and coupon measures.	*Completed.* Program staff investigated database compatibility and streamlined reporting and tracking.
Review trade ally protocols to encourage installation-only contractors to inform customers of the survey and assessment paths.	*Completed.* Program staff revised the trade ally training to encourage installation-only contractors to inform customers of the survey and assessment paths.
Develop guidance to encourage communication between HECs and installation contractors.	*Completed.* Program staff provided guidance on communication between HECs and installation contractors during trade ally training.
Adjust the Operations Manual to provide contact information.	*Completed.* Program staff revised the Operations Manual to include contact information.
Provide a discussion of the program database/software by name, identify key users, and provide usage guidelines in the Operations Manual.	*Completed.* Program staff revised the Operations Manual to describe the program database/software and usage guidelines and to identify key users.
Continue to track direct install and coupon measures separately, but create a unique identifier for each customer so that savings from coupon and direct install measures can easily be matched to the customer.	
Review the need for having both the Program Manual and the Operations Manual and ensure both manuals present matching information, where appropriate.	*Completed.* Program staff reviewed the two manuals and made them consistent.
Implement a data tracking QC process so that each record is checked for accuracy.	*Completed.* Program staff put multiple processes in place to ensure that both the implementer and EAI

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2012 Recommendation	2013 Status
	check each record.
Monitor the transition to the new program tracking database and implement systems that flag potential data entry errors and/or mitigate data tracking inconsistencies.	*Completed.* Program staff monitored the transition to the new program tracking data and put multiple protocols in place to ensure that both the implementer and EAI check each record.

Analysis Methodology

For the HES Program, the Evaluation Team conducted the following data collection and analysis activities.[31]

- Data Collection Interviews
  - Utility Program Manager (n=1)
  - Implementation Staff (n=1)
- End of Year Interview
  - Utility Program Manager (n=1)
- Participant Surveys (n=75)
- HEC Interviews (n=5)[32]
- Program Materials Review
- Desk Review of Completed Projects
- Evaluated Gross Savings Analysis
- Calculation of TRM-Based Savings
- Customer Billing Analysis
- Program Attribution Analysis (NTG)

The Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team reviewed all 2013 HES program tracking data to calculate *ex post* savings (energy and demand) using algorithms and inputs from TRM 3.0. Following the *ex post* savings calculations, the Team applied the program NTG factor (1.04) as well as a factor to account for line losses (1.0849).

The Team estimated net energy savings of 15,119 MWh. This represents 377% of energy-savings goals. These findings are shown in Table 25. The Team estimated net demand savings of 5.7 MW. This represents 247% of demand savings goals. These findings are shown in Table 26.

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31 The Evaluation Team conducted a full process evaluation of the HES Program.

32 Four of the five HECs also performed equipment installations.

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Table 25. HES Program Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
4,011 MWh	15,119	377%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 26. HES Program Demand Reduction Goal and Evaluated Net Demand Reduction

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction* (MW)	Percent of Demand Goal Achieved
2.27 MW	5.67	249%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor.

Tracking Data and TRM Review

The HES Program achieved energy and demand savings from the installation of lighting measures, domestic hot water measures, envelope measures, and cooling measures. The Evaluation Team conducted a detailed review of the HES database to ensure that the tracking data were sufficient to calculate *ex ante* savings and did not contain missing or erroneous values. The Team also compared measure-specific inputs in the database to ensure they were consistent with inputs specified in the TRM 3.0.

Direct Install Measures

Compact Fluorescent Lamps

The Evaluation Team found that EAI used the correct algorithm for calculating CFL savings, but used incorrect assumptions for some inputs. Specifically, EAI and CLEAResult assumed an ISR of 1.0 for CFL measures while the TRM 3.0 (Vol. 2, Sec. 2.5) stipulates an ISR of 0.97 for direct install measures. The Team used a 0.97 ISR to calculate energy and demand savings for this measure. The team used 60 watts for the baseline wattage as shown in the tracking data.

Additionally, the Evaluation Team replaced some parameter values in the TRM 3.0 savings algorithms based on primary data we collected during site visits. We conducted a residential light logging study of EAI customers and determined a mean daily HOU for CFLs of 2.17 hours per day, or 792.6 AOH. The TRM assumes a mean daily HOU of 2.2, or 803.6 AOH. The Team also estimated a mean peak coincidence factor of 10%, which is slightly higher than the 9% EAI used per TRM 3.0.

Low-Flow Showerheads

EAI correctly used the TRM 3.0 algorithm for this measure. According to the tracking data, HES low-flow showerheads were rated at 1.6 gpm. EAI recalculated the gallons per year variable to account for flow rates of 1.6 gpm. TRM 3.0 shows annual gallons per year for flow rates of 2.0 gpm, 1.75 gpm, and 1.5 gpm (Vol. 2, Sec. 2.3.5). The Team agreed with the recalculated gallons saved per year based on a 1.6 gpm flow rate.

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Low-Flow Faucet Aerator

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Hot Water Pipe Insulation

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Advanced Power Strip

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Hot Water Heater Jacket

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Coupon Measures

Following an energy assessment, HES participants receive coupons to offset some of the incremental cost of an energy-efficiency upgrade. Our review of EAI's savings calculations for these coupon measures follows.

Central Air Conditioner Replacements

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Air Sealing

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Heat Pump Replacement

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Ceiling Insulation

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Wall Insulation

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure.

Duct Improvement

EAI correctly used the TRM 3.0 algorithm to calculate savings for this measure; however, the Team encountered some significant challenges when attempting to calculate savings.

The HES tracking data were missing key inputs for this measure and provided incorrect values for some inputs. The TRM 3.0 suggests using a mean SEER of 11.5, but this value was not included in the tracking data. For about one-third of duct sealing installations, the tracking data provided pre- and post-CFM50 values instead of pre- and post-CFM25 values. The implementation contractor helped the Team clarify this particular issue and provided the correct CFM25 values upon request. The Team recreated *ex ante* savings for just under half of all duct sealing installations, but could not determine the reasons for the differences in ex ante and *ex post* savings for the remaining installations of this measure. Upon the Evaluation Team's request, the implementer provided the necessary information to calculate savings.

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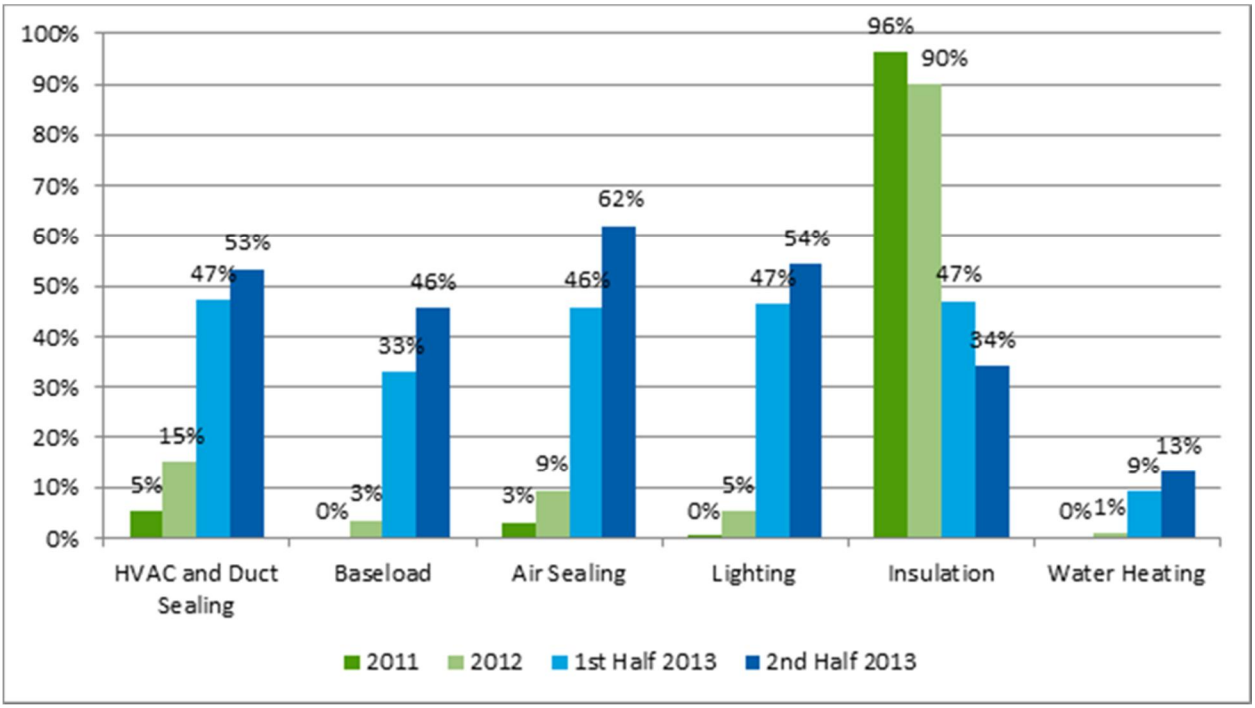
Billing Analysis

The Evaluation Team collected EAI billing data from April 2010 through October 2013, and measure installation data for 2011 and 2012 participants. We conducted a statistical billing analysis of HES Program impacts to determine gross realized savings ratios for whole-house measures installed from January 2011 through December 2012. For a complete description of our method and findings, see Appendix B.

A billing analysis of homes participating in a different year than the current year is required because the analysis requires 12 month of billing data following the program's treatment. This asynchrony is reasonable as long as the program installs a similar mix of measures across the years. Insofar as that is the case, we can apply a realization rate from previous program years to the current year and obtain a good estimate of saving achieved. For HES, however, program design changes, including increasing incentives for installing multiple measures, substantially changed the measure mix between 2011 and 2013. This is shown in Figure 13. In 2011 and 2012, insulation measures represented the majority of measures installed. This was much less the case in 2013.

Figure 13. Percent of Participants Households Receiving Measure Category



The billing analysis conducted on 2011 and 2012 homes, resulted in a realization rate of only 61% for claimed energy savings and 82% for claimed demand reductions. Given the misalignment in measures installed between the period of our billing analysis and the current year, we consider it more appropriate to apply these realization rates as an adjustment to insulation savings only, rather than to all measure categories. These realization results suggest that further investigation of the reasons for the

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divergence between the billing analysis results and the TRM savings values may be warranted in the 2014 program year.

Evaluated Gross Savings

To calculate *ex post* energy savings and *ex ante* demand reductions for HES insulation measures, the Evaluation Team applied the billing-analysis derived realization rates of 0.61 to all *ex ante* energy savings and 0.82 to all *ex ante* demand savings. The billing analysis suggested that the TRM 3.0 approach for calculating *ex post* savings for insulation measures may overstate measure savings. This may be because it does not adequately account for interactions between multiple measures that occur at the household level, or because the homes participating in the program are systematically different than the homes modeled to obtain TRM savings values. Savings for all other HES measures were estimated using algorithms in TRM 3.0.

Table 27, Table 28, Table 29, and Table 30 present *ex ante* and *ex post* energy savings and demand reductions by measure.

Table 27. HES Program *Ex Ante* and *Ex Post* Gross Energy Savings – Coupon Measures*

HES Coupon Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
Central Air Conditioner	112,417	112,417	100.0%
Air Sealing	1,464,445	1,475,647	100.8%
Heat Pump	189,091	189,091	100.0%
Ceiling Insulation	3,545,213	2,162,580	61.0%
Wall Insulation	101,539	61,939	61.0%
Duct Improvement	5,826,939	8,374,370	143.7%
Total kWh Savings	11,239,644	12,376,044	110.1%

* The gross energy savings for coupon measures are presented excluding line losses.
Totals may not sum due to rounding.

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Table 28. HES Program *Ex Ante* and *Ex Post* Gross Energy Savings – Direct Install Measures*

HES Direct Install Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
CFL	646,618	603,680	93.4%
Low-Flow Showerhead	92,996	92,957	100.0%
Low-Flow Faucet Aerator	17,404	17,376	99.8%
Hot Water Heater Pipe Insulation	6,070	5,596	92.2%
Advanced Power Strip	285,239	285,264	100.0%
Water Heater Jacket	18,665	18,665	100.0%
Total kWh Savings	1,066,993	1,023,539	96.0%

* The gross energy savings for direct install measures are presented excluding line losses.
Totals may not sum due to rounding.

Table 29. HES *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction – Coupon Measures*

HES Coupon Measure	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
Central Air Conditioner	48.68	48.68	100.0%
Air Sealing	634.81	635.05	100.0%
Heat Pump	35.53	35.53	100.0%
Ceiling Insulation	1,643.00	1,350.55	82.2%
Wall Insulation	13.88	11.41	82.2%
Duct Improvement	1,921.19	2,803.03	145.9%
Total kW Savings	4,297.09	4,884.24	113.7%

* The gross demand reduction for coupon measures is presented excluding line losses.

Table 30. HES *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction – Direct Install Measures*

HES Direct Install Measure	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
CFL	67.45	94.85	140.6%
Low-Flow Showerhead	9.67	9.67	100.0%
Low-Flow Faucet Aerator	1.81	1.81	99.9%
Hot Water Heater Pipe Insulation	1.81	1.73	95.6%
Advanced Power Strip	35.66	35.66	100.0%
Water Heater Jacket	1.40	1.40	100.0%
Total kW Savings	117.79	145.11	123.2%

* The gross demand reduction for direct install measures is presented excluding line losses.
Totals may not calculate exactly due to rounding.

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Assessment of HES Tracking Data

The Evaluation Team discovered significant issues with both the quality and reliability of the HES tracking data which precluded calculating savings without further guidance from the implementation contractor. We present these issues by measure below.

Ceiling Insulation

The Team noted numerous data formatting issues for baseline R-value ranges (RValue1, RValue2, and RValue3 fields).

- These fields represent the baseline R-value range (e.g., 0 to 4), which is specified in TRM 3.0 as an input to the savings calculation. In the database, these fields have an additional digit (a 6, 7, or 8) appended to the entry (e.g., 15-227). Such entries likely indicate a baseline R-value of 15-22, but the additional digit introduces confusion.
- The Team found some entries of these fields 6, 7, and 8 in records that should have shown blank or null values, as they did not correspond to actual installations of ceiling insulation.
- Some R-value ranges appeared as date formats with an appended digit that the implementer determined would indicate a blank or null cell (e.g., May-88). Ignoring the second 8 (as it is likely indicates a blank), we can reasonably assume that this entry indicates a range of baseline R-values of 5 to 8.
- We found incorrect inputs in ending R-value fields (EndRvalue, EndRvalue2, EndRvalue3):
  - This field requires a numeric input (e.g., 38, indicating that the total R-value following an installation is R-38)
  - Many fields indicated R-value ranges and were incorrectly formatted as dates, similar to the issue discussed above (e.g., 15-22, 8-May, 14-Sep).

The Evaluation Team discovered the data issues specific to ceiling insulation during an initial tracking data review in August 2013. The Team informed EAI and the implementation contractor in August 2013 and the implementer reported they had fixed these data issues moving forward; however, the issues were still present in the final 2013 tracking data. CLEAResult provided the correct data upon request and the Team verified savings for the ceiling insulation measure.

Duct Improvement

- One-third of records incorrectly included pre- and post-CFM50 values (which would have been determined through a blower door test) instead of CFM25 values. The Team made this determination due to the very high pre- and post- values that would have been impossible to achieve through a blower door test. The implementer reported addressing this issue going forward and provided corrected values upon the Evaluation Team's request.
- An incorrect cooling system SEER value was used for all duct sealing installation records.
  - This field contained only one value, 1, for all duct sealing installation records. The implementer provided corrected values upon the Evaluation Team's request.

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- The HVAC type for duct sealing installations was unclear.
  - The Team looked up HVAC type from other data corresponding to each household installing duct sealing; however, it was still not clear whether EAI calculated cooling and heating savings separately where needed.

The Evaluation Team discovered the issues with the duct sealing measures after receiving the 2013 tracking data in January 2014. Although the implementation contractor was helpful in addressing and correcting the issues, the Team was not able to resolve questions regarding the correct HVAC type. As such, we could not adequately verify savings for duct sealing through TRM review.

Net-to-Gross Analysis

The Evaluation Team calculated two distinct freeridership rates for HES Program participants and contractors, following the analysis methodology outlined in the Methodology section of this report. Details specific to the HES Program are outlined below.

Freeridership

As some customers installed more than one program measure, the Team assessed participant freeridership at the measure level rather than at the participant level. We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had pre-existing plans to purchase or install the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without HES, they would have installed a program-eligible measure of the same (or higher) efficiency within a year.

Table 31 shows the survey questions we used to assess freeridership for each criterion. We then used the three freeridership criteria scores to determine overall program freeridership.

Table 31. HES Participant Freeridership Category Questions

Freeridership Criteria	Survey Questions
Prior Plans for Measure Installation	Before learning about the HES Program, were you already planning to purchase and install the measure in 2013?
Available Budget	If the coupon or rebate savings from the program had not been available, could your budget have accommodated the full cost of the measure in 2013?
Stated Intent	Without the rebate or coupon savings, would you have purchased a measure that had the same (efficiency/R-value)?
	Without the coupon savings, would you have (performed/purchased) the measure (sooner, at the same time, later in the same year, in one or two years, etc.)?

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The Evaluation Team asked 73 participants about 117 measures they installed through the program. We identified respondents as freeriders if they simultaneously met all three criteria. Their responses indicated that there were freeriders for five of the measures. Accordingly, the *unweighted unadjusted* participant freeridership rate is estimated to be 4%, as shown in Table 32.

Table 32. HES Program Unweighted Unadjusted Participant Freeridership Rate

Freeridership Criteria	Unweighted Percent of Measures that Met Criteria (n=117)*
Prior Plans for Measure Installation	15%
Available Budget	20%
Stated Intent	9%
Unweighted Freeridership Rate	4%

* Seventy three end-user participants answered freeridership questions about 117 HES coupon measures.

Contractor Freeridership

The Evaluation Team interviewed five trade allies to estimate the HES Program contractor freeridership rate.[33] We determined the contractor freeridership rate by examining their responses to two questions that measured the influence of the program on the installation of high-efficiency equipment and services, as shown in Table 33.

Table 33. HES Program Contractor Freeridership Variables and Survey Questions

Variable	Survey Questions
Sales Changes in Absence of the Program	Thinking about the measures that you installed or performed with a program rebate, if the program had not existed, how many measures do you think you would have installed or performed in the past one year? In thinking about your response, please remember to consider both the program rebate for the measure and the program support for the Tier 2 energy assessments, which helped identify these energy-savings opportunities.
Program Importance	In general, how important would you say the HES Program as a whole was to your customers' decision to install the measures? Again, please consider the combined importance of the energy assessments and the measure incentives.

Four of the five contractor interviewees indicated they installed measures that the HES Program had rebated; all four installed more than one of the program-incented measure types.[34] The Team asked the contractors NTG questions about the single measure type that they reported installing most through the program in the last year.

[33] The five contractors represented 73% of program savings at the time of the interviews.

[34] The fifth interviewee's HES Program participation was limited to Tier 1 and Tier 2 energy assessments, and as a result we did not include them in our NTG estimate.

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In total, the four contractors reported installing or performing 1,262 program-supported jobs that included their respective key measure types. All reported that few measure installations would have taken place in absence of the program and that the program was very important in customers' decisions to install or perform the measures. In total, the contractors estimated that in absence of the program, they would have installed 123 of the 1,262 measures, resulting in an *unweighted* contractor freeridership rate of 10%.

Adjusted Freeridership

The Evaluation Team applied the unweighted contractor freeridership rate to participants who reported that the contractor was important in their decision to purchase and install program measures. We determined contractor importance by asking about the importance of three program elements related to the contractor: the contractor, the energy assessment report, and the measures recommended in the assessment report (Table 34). If respondents indicated that all three of these factors were very important in their installation decisions, then we considered their contractor as important in their decision to purchase and install program measures.

Table 34. HES Program Participant Contractor Importance Questions

Survey Questions	Response Categories
How important was the Home Energy Consultant who came to your house and did your energy assessment in your decision to purchase the measure?	Very Important Somewhat Important Not Very Important Not at all Important
How important was the energy assessment report in your decision to purchase the measure?	
Now, thinking about the recommended measures from the home energy assessment report, how important were the assessment findings in your decision to install the recommended measures in 2013?	

Participants indicated that the contractor was important in their decisions to install 61% of the 117 measures we asked about (Figure 14). For these participants, we substituted the contractor freeridership estimate for the freeridership rate reported by participants.

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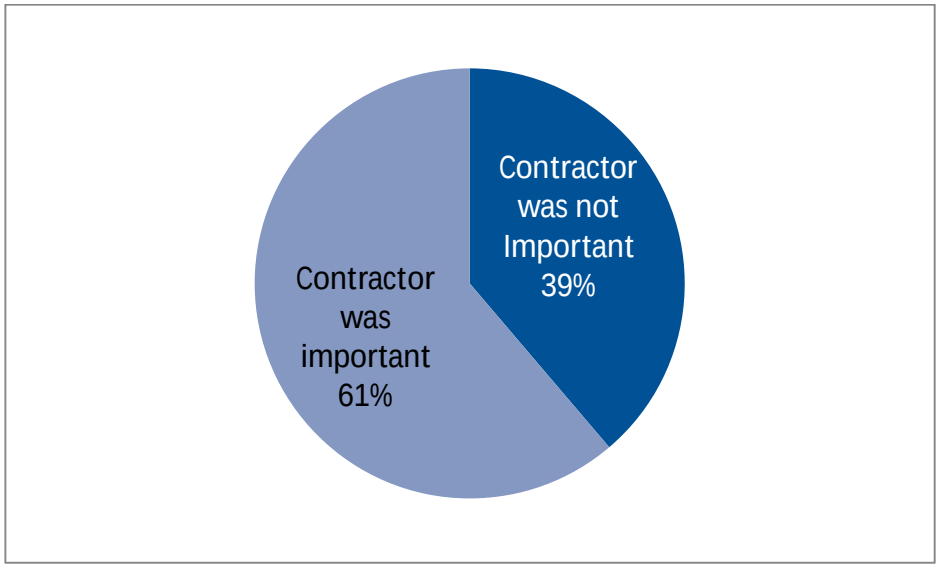
Figure 14. HES Program Contractor Importance



Multiple survey questions (G9, G10, and C10); see Appendix A (n=117 measures; 73 respondents)

Participants said the contractor was important in their decisions to install all five freerider measures. As a result, while the overall unadjusted participant freeridership rate was 4%, the freeridership rate among the 39% of measures for which the contractor was not important was 0% and the rate among those for which the contractor was important was 7%. As shown in Table 35, after applying the *unweighted* contractor freeridership rate of 10% to those 61% of measures, the *adjusted unweighted* participant freeridership rate is 6%.

Table 35. HES Program Participant Unweighted Adjusted Freeridership Rates by Contractor Importance

Contractor Importance	Number of Measures	Percent of Measures	Freeridership Rate Type	End-User Estimated, Unadjusted Freeridership	Adjusted Freeridership
Contractor was not important	46	39%	Unadjusted end-user participant	0%	0%
Contractor was important	71	61%	Contractor	7%	10%
All	117	100%	Overall end-user participant	4%	6%

Weighted Freeridership

To account for the different savings values associated with each of the installed measures, the Evaluation Team weighted the freeridership results by the measure-level program savings to estimate the final freeridership rate. The unweighted contractor freeridership rate of 10% remained the same when we weighted the results.

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The gross savings associated with the 117 measures in the program database summed to 171,916 kWh. To estimate net savings, the Evaluation Team weighted the savings for each measure by its freeridership rating. The *unadjusted weighted* freeridership rate was 5%.

However, if we determined a contractor was important to the participant's decision to install the specific measure, then we applied the weighted contractor freeridership rate to that measure's savings. Because the contractor freeridership rate did not change after weighting, when we applied the weighted contractor freeridership rate, the ratio of the sum of net savings to gross savings still resulted in an *adjusted weighted* freeridership rate of 6%. Table 36 shows the gross and net savings corresponding with these freeridership ratings.

Table 36. HES Program Participant Weighted Unadjusted and Adjusted Freeridership Rate

Stratum	Total Measures	Gross Savings (kWh)	Unadjusted Net Savings		Adjusted Net Savings*	
			% Assigned	Net Savings (kWh)	% Assigned	Net Savings (kWh)
Contractor Important - Non-Freerider	66	97,853	100%	97,853	90%	88,068
Contractor Unimportant - Non-Freerider	46	65,789	100%	65,789	100%	65,789
Contractor Important - Freerider	5	8,274	0%	-	90%	7,447
Contractor Unimportant - Freerider	-	-	0%	-	0%	-
Total	117	171,916		163,642		161,303
Weighted Freeridership				5%		6%

* We assigned a weighted contractor freeridership rate of 90% to measures for which the contractor was important. Totals may not sum exactly due to rounding.

Spillover

The Evaluation Team attempted to calculate spillover values for end-user participants and contractors in the HES Program. The Team quantified like-spillover, which is equipment installed outside the program that is the same type and efficiency as the equipment offered through the program, where the customer's experience with the program was important in their decision to implement the measure(s).

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The following criteria are required for a measure or service to potentially be considered spillover:

- Service or measure is HES-like,
- Neither the contractor respondent nor their customer received a program incentive for the purchase, and
- HES was either important or somewhat important in the decision to perform the service.[35]

One of the five contractors reported like-spillover, stating that 30% of their 550 program-eligible ceiling insulation projects[36] did not receive program incentives, and that the program had been very important in their decision about which type of ceiling insulation to install in those 165 projects. The contractor specified that, in those instances, if they had not been aware of the HES Program, they likely would have installed ceiling insulation that was 50% lower in efficiency without a program incentive.

Based on program tracking data, the Evaluation Team estimated 132,705 kWh in energy savings for the 165 spillover ceiling insulation installations. The resulting spillover rate estimate is 9% of gross savings. Table 37 provides further details.

Table 37. HES Contractor Spillover Savings

Variable	Description	Value
Spillover-Eligible Measure Count	Ceiling insulation contractor reported installing outside of the program due to program influences	165 Ceiling Insulation Projects
Per-Unit Savings	Per-unit ceiling insulation savings from program tracking data	1,609 kWh
Spillover-Eligible Measure Savings	Fifty percent of the product of the number of spillover-eligible measures and the per-unit savings*	132,705 kWh
Gross Program Savings	Savings associated with the 1,262 projects asked about in the contractor surveys	1,468,370 kWh
Spillover Rate	The result of dividing the spillover-eligible measure savings by the gross program savings	9%

* The contractor indicated that their non-program ceiling insulation projects' were 50% lower in efficiency than what they installed through the program. As such, we allocated 50% of the equivalent program-eligible savings to the 165 non-program ceiling insulation projects.

Five program participants reported performing or installing like-spillover measures. Three participants reported installing a total of 25 CFLs and the two other reported installing a total of 22 LEDs outside of the program. Based on program tracking data, the Evaluation Team estimated 1,268 kWh in energy

[35] The Evaluation Team asked respondents to identify the extent to which the program influenced their non-program sales (contractors) and non-program purchases (participants) using a scale of very important, somewhat important, not very important, or not at all important.

[36] The contractor said that they had completed 1,100 or more projects in the last year, 50% for which they had installed program-eligible ceiling insulation. For the purposes of analysis, we associated the contractor with 550 program-eligible ceiling insulation projects.

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savings these like-spillover measures. The resulting spillover rate estimate is 1% of gross savings. Table 38 provides further details.

Table 38. HES Participant Spillover Savings

Variable	Description	Value		
		CFLs	LEDs	Total
Spillover-Eligible Measure Count	Units respondents reported installing outside of the program due to program influences	25 Bulbs	22 Bulbs	
Per-unit Savings	Per-unit savings from program tracking data	25 kWh	29 kWh	
Spillover-Eligible Measure Savings	Product of the number of spillover-eligible measures and the per-unit savings	630 kWh	638 kWh	1,268 kWh
Gross Program Savings	Savings associated with the 117 measures asked about in the participant survey			171,916 kWh
Spillover Rate	Spillover rate is the result of dividing the spillover-eligible measure savings by the gross program savings			1%

In addition, three respondents installed or performed three non-program-like measures for which they did not receive coupons but said the program was important in their decision to do so. They purchased an energy-efficient dishwasher, caulked their windows, and began adjusting their thermostat. As noted in the Methodology section of this report, the Evaluation Team only quantified program-like spillover.

Net-to-Gross

Table 39 presents the NTG ratio for HES participating customers.

Table 39. HES Program Customer Net-to-Gross Ratio Values and Calculation

Parameter	Value
Weighted Adjusted Freeridership Rate	0.06
Spillover	0.10
Net-to-Gross Ratio	1.04

Evaluated Net Savings

The final evaluated net savings for the HES Program are shown in Table 40. Applying the 1.04 NTG ratio to *ex post* gross savings resulted in *ex post* net energy savings of 13,935,566 kWh and coincident peak demand reduction of 5,230.5 kW.

Table 40. HES Program Evaluated Net Savings*

Savings	*Ex Post* Gross Savings	Net Savings	Net-to-Gross Ratio
Coincident Peak Demand Savings (kW)	5,029.6	5,230.5	1.04
Annual Energy Savings (kWh)	13,399,582	13,935,566	1.04

* Savings are presented excluding line losses.

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Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by supporting findings gathered during the evaluation.

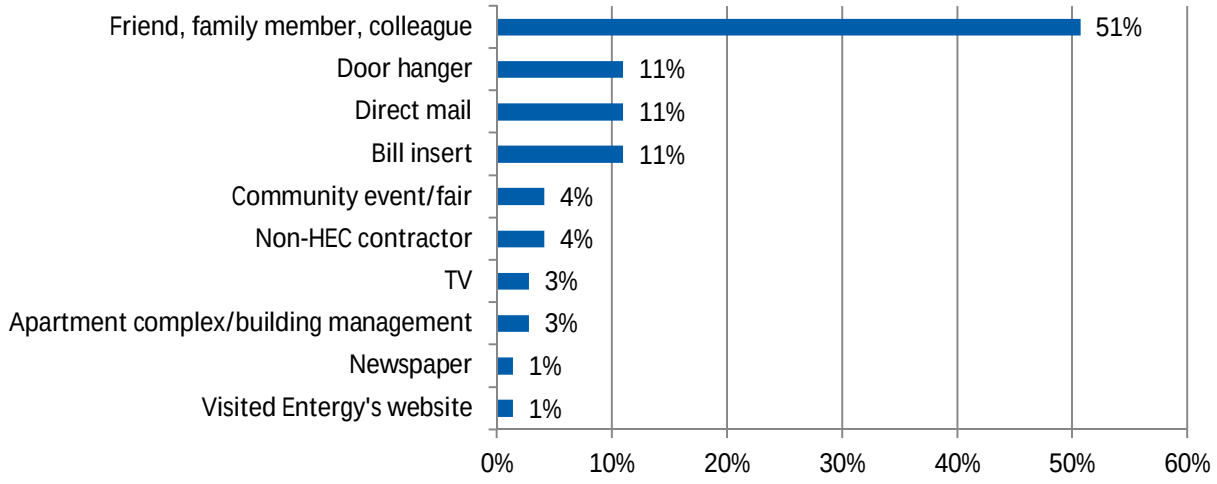
Marketing and Outreach

Word-of-mouth is an effective way to drive customer awareness.

Although HES Program management and CLEAResult staff reported that the key driver of program awareness is the HEC contractor network, just over half of surveyed HES participants (51%) said they first learned about the program from a friend, family member, or colleague (Figure 15). HECs were not included as an option in the survey, so the Evaluation Team was unable to definitively document their impact on how customers learn about the program.

Beyond word-of-mouth, equal proportions of HES participants (11% each) said they first heard about the program from door hangers, direct mail, and bill inserts. Very few participants cited traditional marketing such as television and newspaper advertisements, and 1% heard about the program through EAI's website.

Figure 15. How HES Participants First Heard About the Program



QB3. How did you first hear about Entergy's Home Energy Solutions Program? (n=75)

Saving money remained the largest motivation for program participation.

Although the opportunity to save money or reduce monthly energy costs was still the primary driver for program participation in 2013 (cited by 43%), it was substantially lower than in 2012 (76%). One-fifth of 2013 HES survey respondents (20%) cited saving energy as a key motivator for program participation, compared to 14% of 2012 respondents. 2013 survey respondents mentioned other influences to program participation that are similar to those for 2012, including: recommendation from a friend or family member (5%), program coupons (4%), technical information received from contractor (3%), and comfort issues in home (3%).

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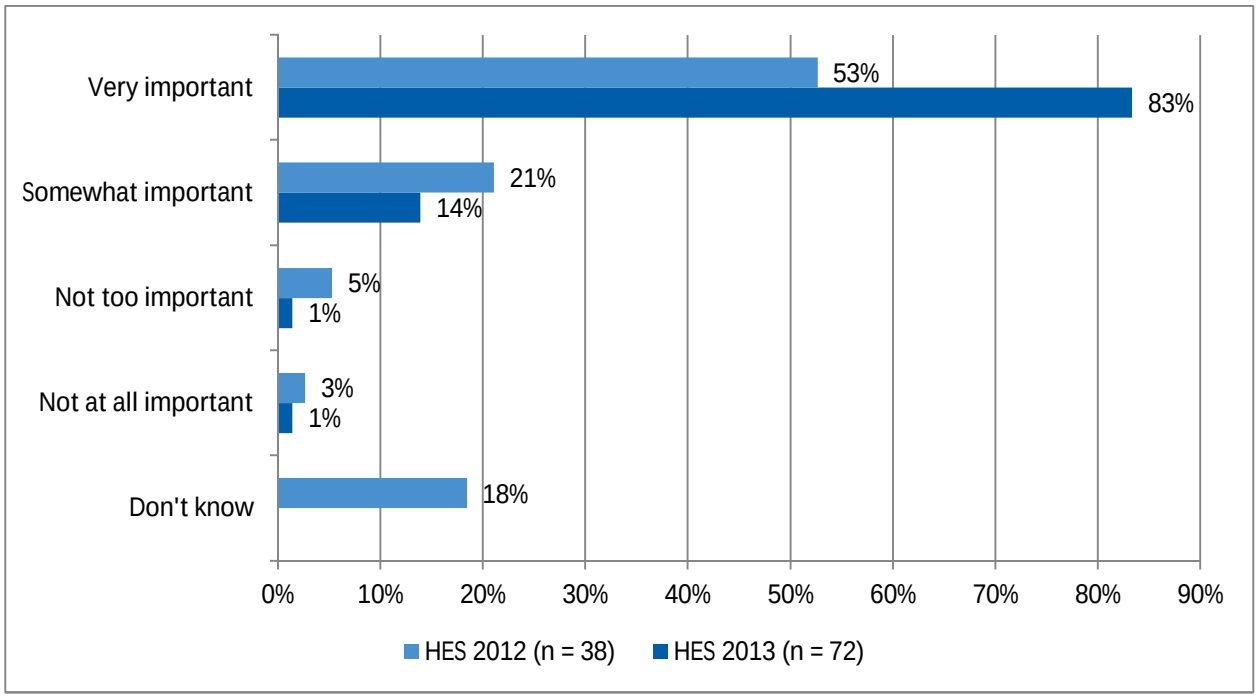
Although understanding the assessment report was a key factor in customers' decision to install recommended measures, not all customers received assessment reports.

More customers reported receiving an assessment report in 2013 (77%) than in 2012 (55%). In addition, substantially more customers said the assessment findings were very important (83%) or somewhat important (14%) in their decision to install recommended measures compared to 2012 (at 53% and 21%, respectively; Figure 16).

Figure 16. Importance of HES Assessment Report in Decision to Install HES Measures



QC10. Thinking about the recommended measures from the home energy assessment report, how important were the assessment findings in your decision to install the recommended measures in 2013?

Customer Satisfaction

Customers remained very satisfied with their program experience.

Nearly all 2013 HES participants were either very satisfied (73%) or somewhat satisfied (24%) with their program experience. This is largely consistent with 2012 findings, in which the majority of customers reported being either very satisfied (76%) or somewhat satisfied (18%). Figure 17 presents the overall satisfaction findings for 2012 and 2013 HES participants.[37]

[37] The differences shown are observed differences only.

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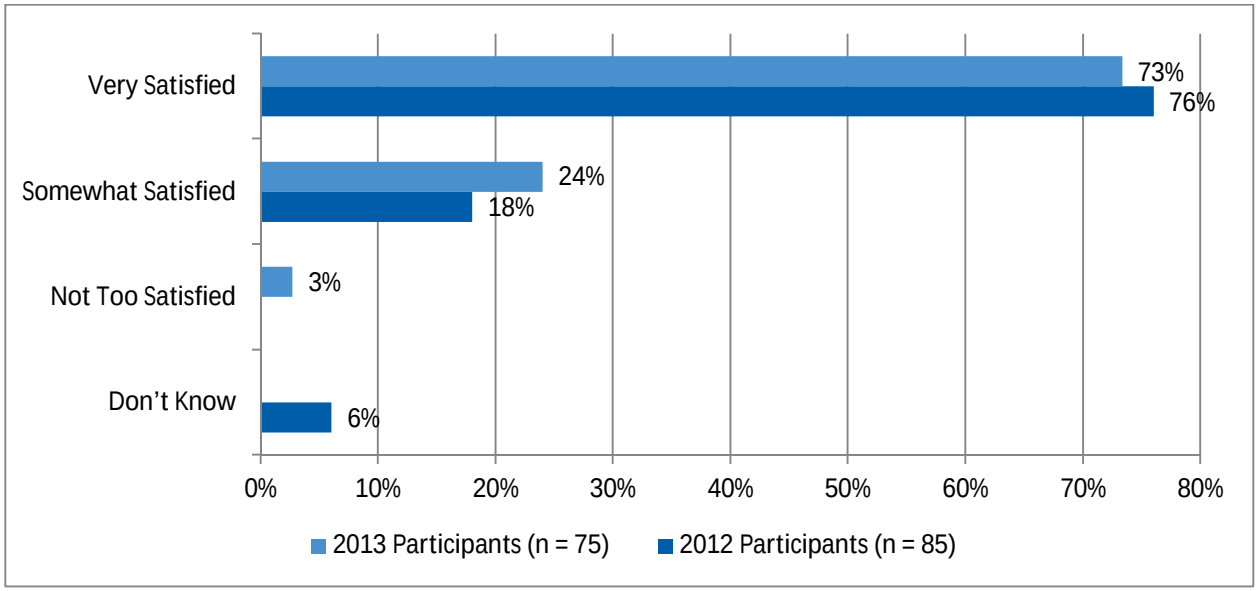
Figure 17. Overall Satisfaction with HES Program Experience



QE1 Overall, how satisfied are you with the Home Energy Solutions Program?

Customers were much more likely to recommend the program to a friend, family member, or colleague in 2013 (97%) than in 2012 (84%).

Nearly three-quarters (73%) of customers reported being very satisfied with their HEC, and 23% reported being somewhat satisfied.[38] Four percent reported being not too satisfied with their HEC.

Customer awareness of HES coupons continues to be limited.

Thirty-two percent of customers who installed ceiling insulation, 40% of customers who installed wall insulation, 43% of customers who installed air sealing, and 35% of customers who installed duct sealing reported that they did not receive a coupon for installing these measures. Awareness of program coupons continued to be a problem in 2013, as it was in 2012 when roughly 30% of participants reported not receiving a coupon.[39] Program staff reported that contractors who install duct sealing, air sealing, and insulation measures tend to approach customers as "one-stop shops," providing both an assessment and equipment installation in one visit. Rather than providing customers with a paper coupon, contractors obtain a customer signature on the coupon, which they then submit to the implementer for processing. In addition, program staff indicated that more of these contractors are offering measures at little or no cost to the customer in 2013, all of which may contribute to the customers' lack of awareness of program coupons.

[38] This question was not asked in 2012.

[39] In 2012, this question asked about all coupons in aggregate.

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Program Delivery and Implementation

The one visit delivery approach created a competitive market among trade allies.

According to the implementation staff, recruiting trade allies that were able to deliver the program using the one-stop model impelled existing HECs to be more innovative in their HES Program delivery. In addition, the implementer confirmed that many existing HECs made substantial capital investments in new equipment and vehicles in 2013 to keep up with the new trade allies. Overall, participating trade allies appear to have a positive outlook on the new business model. For example, a local HEC who had participated in 2012 commented that, "without the program, I might be doing one-tenth my current volume." This HEC changed his business model in 2013 to offer a free assessment, followed-up by having a partnering contractor install the recommended measures later that day.

Trade Ally Response

Trade allies were very satisfied with the HES Program.

All of the interviewed trade allies (n=5) expressed satisfaction with the program and reported that program participation increased their business volume. The new, out-of-state trade allies said they would not have operated in Arkansas if the HES Program was not offered. These companies reported hiring and training local crews as a direct result of program demand. Additionally, trade allies noted it was beneficial to be able to offer the program to their customers.

- One local trade ally specifically reported that his customers have provided a lot of good feedback on the program and some have even, "…shared success of 30% to 50% energy savings"… in their homes thanks to the program.
- An out-of-state contractor commented that the program, "…helped grow [his] business…" and that he, "…hired local crews."
- Another out-of-state contractor noted that his firm had, "…hired one [employee] locally and [he] plans to hire more."

The trade allies agreed that the program implementer provided satisfactory support. Specifically, trade allies mentioned that the implementation staff was quick to respond and resolve any project issues. However, several mentioned some difficulty tracking jobs for which they received payment and job status after submitting the completed paperwork. These trade allies requested that the implementer track each job individually through the approval and payment process, and provide a way for the trade allies to track the status of their projects.

TRM

The TRM-based insulation savings are higher than billing analysis results.

Our billing analysis showed a realization rate of only 61% for energy savings and 82% for demand reductions compared with the TRM calculations. Homes in our analysis had primarily received insulation measures. This suggests a need to further investigate the reasons for this divergence in savings estimates in upcoming evaluations and, if warranted, adjust TRM values.

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The Implementer used some parameter values that were not consistent with TRM 3.0 specifications.

During our review of the 2013 HES tracking data, the Evaluation Team discovered that the program implementer had used some parameter values as inputs to savings calculations that were not specified in the TRM 3.0. Specifically, the implementer used an ISR of 1, AOH of 803.6, and peak CF of 9% for CFLs.

The deemed HOU and peak CF values listed in the TRM 3.0 to calculate lighting savings do not reflect conditions in Arkansas.

Based on our light logging study, the Evaluation Team estimated a mean HOU of 2.17 hours per day. This is slightly less than the 2.2 mean value specified in TRM 3.0. When converting the mean values to AOH, the TRM 3.0-based 2.2 HOU becomes an 803.6 AOH, while the measured 2.17 HOU becomes a 792.6 AOH, which is more representative of conditions in Arkansas. The TRM 3.0 also assumes a 9% peak CF based on the results of a 2005 California study. The Evaluation Team estimated a mean weighted value of 10.0% for the peak CF.

The TRM is not clear regarding lighting peak CF assumptions.

TRM 3.0 is ambiguous regarding the peak period for lighting, stating, "during the summer months, an average of 9% of residential CFLs installed indoors may be expected to be operating on summer weekdays between the hours of 1500-1900." The TRM does not specify what months qualify as "summer." Some utilities define this period as June through August, while others define it as June through September.

Data Tracking and Reporting

HES tracking data contained multiple errors.

The 2013 HES tracking data contained several errors that required a laborious process to locate missing or incorrect values and prepare the data for analysis. The Team identified and discussed some data issues with EAI and the implementer staff early in 2013; however, we found these issues along with some new errors in the final 2013 tracking data.

Evaluation Recommendations

The Evaluation Team provided recommendations relevant to errors identified in the program tracking database and updates to the TRM (as described above) under the Portfolio-Level Recommendations section of this report.

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Entergy Arkansas New Homes Program

Through the New Homes Program, EAI provides incentives to builders who construct qualified energy-efficient homes. Qualified homes must meet high energy-efficiency performance standards and/or adhere to stringent energy performance checklists. A RESNET-accredited HERS rater must verify each home's compliance with ENERGY STAR standards using an approved energy use simulation program and a series of on-site inspections and diagnostic tests. Through the New Homes Program, EAI provides financial incentives to help offset cost barriers and raise awareness of the value of high performance homes.

EAI offers three types of incentives to participating home builders:

1. *Special Rate (Tier 1):* $300 for each home built at least 15% more efficient than the ADFA grant requirements.
2. *High Performance (Tier 2):* $600 for each high-performance home built to ENERGY STAR version 2.5 standards.
3. *ENERGY STAR (Tier 3):* $1,000 for each ENERGY STAR-qualified home built to ENERGY STAR version 3.0 standards.

To qualify for New Homes Program incentives, EAI requires that builders strictly adhere to data collection protocols. EAI encourages home builders to work closely with their HERS rater and other stakeholders to ensure they submit the required program information in a timely and efficient manner. HERS raters typically collect data during each home's final performance test. EAI pays incentives to home builders after receiving and verifying all the required data for each home constructed through the program.

ICF implements the New Homes Program with oversight from EAI.

Program Status Overview

In 2013, 56 homes were submitted to the New Homes Program, but only 24 homes passed the stringent criteria required to qualify for program incentives. The New Homes Program achieved only 5% of its energy savings goal and 6% of its peak coincident demand savings target. The program also did not achieve its participation target of 450 homes; however, 18 of the 34 ENERGY STAR-certified homes built in Arkansas in 2013 were built through EAI's New Homes Program.[40] This represents a 53% market share of ENERGY STAR-qualified homes in Arkansas, which is a comparatively strong result. Table 41 summarizes the 2013 results.

[40] ENERGY STAR. "New Homes Partners in Arkansas." Accessed January 14, 2014. https://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showStateResults&s_code=AR&show=none

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Table 41. New Homes Program 2013 Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	1,084	59	5%
Demand Savings (MW)*	0.33	0.02	6%
Participation (homes)	450	24	5%
Budget	$531,230	$380,706	72%

* The evaluated net MWh and MW values include a line loss adjustment factor of 1.0849.

Historically, the number of ENERGY STAR-certified homes built in Arkansas has been low. In 2012, Arkansas had an ENERGY STAR Certified New Homes Market Index of less than 5%, which was among the lowest in the country.[41]

The most significant change made to the New Homes Program in 2013 was the addition of the Special Rate (Tier 1) to the program's incentive structure. New Homes Program staff added the Special Rate incentive tier to encourage builders working on ADFA low-income housing projects to participate in the New Homes Program. Although New Homes Program staff added the Special Rate tier to encourage greater program participation, no homes qualified for the $300 Special Rate incentive during 2013.

Because of the program's low 2012 participation, EAI shifted more than $100,000 of the New Homes Program 2013 budget to the Energy Solutions for Multifamily Program to supplement overall portfolio savings.

Status of 2012 Evaluation Recommendations

Table 42 lists the status of each of the New Homes Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* New Homes Program staff completed nearly all of the 2012 New Homes Program recommendations during the 2013 program year.

Table 42. 2013 Status of 2012 New Homes Program Recommendations

2012 Recommendation	2013 Status
Continue outreach to builders to increase program participation and awareness of high-performance buildings.	*Completed*. The program implementer continued to reach out to builders and HERS raters through in-person meetings and telephone calls.
Work with participating HERS raters to identify potential outreach targets among those builders already familiar with high-performance buildings.	*Completed*. The program implementer held builder meetings at participating HERS raters' offices.
Continue to engage builders and HERS raters through in-person meetings, especially at the beginning of their	*Completed*. The program implementer continued to offer in-person meetings to all builders.

[41] ENERGY STAR. "2012 ENERGY STAR Certified New Homes Market Indices for States." Last modified July 8, 2013. Accessed January 14, 2014. http://www.energystar.gov/index.cfm?fuseaction=qhmi.showHomesMarketIndex.

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2012 Recommendation	2013 Status
program participation.	
Maintain continued outreach to participating builders and HERS raters through email with critical program information.	*Completed*. The program implementer sent two email blasts to the entire builder database in June 2013.
Expand builder outreach to target all builders in the residential sector (e.g., low-income, single metered multifamily), leveraging trusted sources such as Home builders associations (HBAs).	*Completed.* The program implementer continued to reach out to builders through HBAs in 2013.
Continue to work with the builders identified in the low-income housing market and in the U.S. Department of Housing and Urban Development grants.	*Completed*. EAI staff added a third incentive tier to encourage builders working on low-income housing projects for the ADFA to participate in the program. The program implementer requested an opportunity to speak at the ADFA regional builder meetings.
Explore options to offer higher incentives for projects in the low-income sector when outside funding sources (e.g., U.S. Department of Housing and Urban Development grants) may not be available.	*Completed.* Program staff explored increased incentives based on the 2004 State Energy Code. However, the New Homes Program is not cost-effective, therefore increased incentives were not plausible.
Explore the costs and benefits associated with increasing the program incentives for homes built to ENERGY STAR version 3.0 standards.	
Monitor program participation in Tier 2 and research what it costs builders to build to this standard.	*In Progress/Partial.* The program implementer is working with ENERGY STAR to provide regional cost estimates.
Promote the New Homes Program to builders to comply with 2009 International Energy Conservation Code (IECC). Explore developing outreach materials, program training, and technical support that help builders navigate the new code.	*Completed*. The program implementer discussed compliance with 2009 IECC during builder presentations and trainings.
Continue to identify builders that are actively building new homes within EAI's service territory by pulling builder contact information from recent building permit applications or EAI temporary hook-up service applications.	*Completed.* The program implementer pulled temporary service requests three times during 2013 to identify potential participants.
Review the potential participant builders in ICF's database annually to eliminate those that are not active in Arkansas or are not inclined to participate.	*Completed*. The program implementer updated the builder database at the end of 2012 and the end of 2013.
Continue to target outreach efforts to smaller, custom, and semi-custom builders. Outreach to this sector should include personal interactions through phone calls, invitations to presentations, etc.	*Completed.* The program implementer called 140 central Arkansas builders to inform them of program trainings held in June 2013.
During the program training, ask builders for a verbal commitment to participate in the program on their next construction project.	*Completed*. The program implementer asked builders to partner with the program.

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2012 Recommendation	2013 Status
Follow up with builders after they participate in program trainings to provide support and answer any additional questions they have about the program.	*Completed*. The program implementer followed up with training attendees via phone.
Consider revising the *New Homes Program Manual* to more clearly define the roles and responsibilities of all the stakeholders involved. Create a detailed process flow chart and logic model with clearly assigned stakeholder roles to clarify the project development process.	*Completed.* The program implementer revised the flow chart in the *New Homes Program Manual* to more clearly define stakeholder roles.
Ensure that all participating builders and HERS raters are trained on the updated protocols and understand their program responsibilities.	*Completed*. The program implementer offered training to all participating builders and HERS raters.
Consider promoting program success stories through case studies.	*Completed*. The program implementer developed a case study at the end of 2013 that will be released in 2014.
Review program milestone updates to identify how they could be more useful to builders and HERS raters, such as by including specific information about which steps are complete and what is needed for a home to be considered finished.	*Completed*. The program implementer made modifications to the Vision database to include automated emails that notify program stakeholders when information is missing or actions are needed before a home can be considered complete.
Increased support from ICF may be necessary to ensure that participants upload all of the necessary project data to Vision.	*Completed*. The program implementer provides ongoing Vision database support to all program stakeholders.
Review data tracking and REM/Rate files to ensure that each home constructed through the program contains all necessary data/documentation.	*Completed*. The program implementer reviewed all program data in 2013.

Analysis Methodology

For the New Homes Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[42]

- Data Collection Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Year-End Interviews
  - Utility Program Manager (n=1)
  - Implementation Manager (n=1)
- Participant Home Builder Interviews (n=7)[43]

[42] The Evaluation Team conducted a full process evaluation of the New Homes Program.

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- Marketing and Materials Review
- Program Tracking Database and HERS Rater File Review (n=24)
- Review of Beacon Predictive Savings Tool (PST)
- REM/Rate Modeling of Energy Savings
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the New Homes Program, which consisted of reviewing the tracking database, Beacon PST, HERS rater files, and REM/Rate energy modeling for each home constructed through the program.

Because participation fell well below the program goal, the New Homes Program achieved only 5% of its energy-savings goal of 1,084 MWh, based on evaluated net energy savings. Table 43 presents these results. The New Homes Program fell short of its peak coincident demand-savings goal by a similar percentage (Table 44). Values in these tables reflect an upward adjustment of 8.49% to account for line losses between the point of generation and the point of savings, as well as the evaluated 0.72 NTG ratio.

Table 43. New Homes Program Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
1,084	59	5%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 44. New Homes Program Net Demand Reduction Results

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction* (MW)	Percent of Demand Goal Achieved
0.33	0.02	6%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor.

Review of Program Tracking Data

The Evaluation Team examined 24 homes in the tracking database, along with the associated REM/Rate files and complete documentation of gross and net savings.

[43] At the time of the interviews, the seven builders we spoke with were actively participating in the program. However, by the end of 2013, two of the seven interviewees' homes had not fulfilled the program requirements and therefore did not qualify as participating homes.

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Review of Beacon PST

The Evaluation Team coordinated with the implementation contractor, ICF, for a demonstration of the Beacon PST and to examine how it handled inputs to estimate energy and demand savings. Beacon PST is a DOE-2 interface modeling tool that converts REM/Rate files into DOE-2, then simulates the energy consumption of a home. Beacon PST also creates a baseline home designed to the prevailing energy code (i.e., the Arkansas 2004 International Residential Code (IRC) and allows the user to estimate inputs required for the DOE-2 simulation that are not available in REM/Rate.

The Evaluation Team reviewed the assumptions in the tool and found them to be reasonable and to have a minimal impact on savings estimates. We also noted that Beacon PST makes unique assumptions relating to duct systems and installation quality.

Evaluated Gross Savings Analysis

The Evaluation Team received HERS rater files for 25 homes and determined that they were complete and accurate. While the program tracking data provided claimed (*ex ante*) savings values for 24 homes, one of the REM/Rate files had not been approved and was not a 2013 program year home. The Team did not include this home in our analysis. To provide an accurate realization rate of evaluated (*ex post*) savings to reported (*ex ante*) savings, the Evaluation Team used REM/Rate to model energy and demand savings for the 24 homes for which we received HERS files, REM/Rate files, and *ex ante* savings values.

The Evaluation Team conducted the following steps to model savings:

- We created a User Defined Reference Home (UDRH) for each foundation type and for the two climate zones associated with all homes in the tracking database. The UDRH allowed for a more consistent comparison between the baseline and the as-built homes.
- We modeled five homes by manually inputting code variables into the model and comparing them to the UDRH. This method revealed consistent energy use between the manually modeled homes and the UDRH modeled homes.

The Evaluation Team used REM/Rate modeling to estimate ex post savings. We then compared the modeling estimates from REM/Rate to the estimates ICF derived using its proprietary savings tool. We matched the baseline assumptions between the two tools as closely as possible. The results of modeling the homes in REM/Rate show very close overall agreement with Beacon PST's estimated energy and demand savings. Energy savings form the Beacon PST tool fell within 3% of REM/Rate and demand savings fell within 4% of REM/Rate. Thus, the Beacon PST appears to accurately estimate energy and demand savings. These results are shown below in Table 45 and Table 46, respectively. These values reflect savings at the point of consumption, and thus exclude line loss.

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Table 45. New Homes Program *Ex Ante* and *Ex Post* Gross Energy Savings

Participants	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
24	75,428	75,428	100.0%

* The gross energy saving are presented excluding line losses.

Table 46. New Homes Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction

Participants	*Ex Ante* Energy Savings (kW)	*Ex Post* Energy Savings (kW)	Realization Rate
24	23.4	23.4	100.0%

* The gross energy saving are presented excluding line losses.

Net-to-Gross Analysis

The Evaluation Team calculated freeridership and spillover rates for the New Homes Program following the analysis methodology outlined in the Evaluation Methodology section of this report. We used participating builder survey responses regarding the program's influence on their decision to build energy-efficient homes. The Team surveyed six builders, representing all but one of the seven builders who participated in the 2013 program year. We asked if the program and its financial incentives impacted their decision to build homes to the program standards. Table 47 shows the survey questions the Team used to assess freeridership for each criterion.

Table 47. New Homes Participant Freeridership Questions

Freeridership Criteria	Survey Question
Incentive influence	Did the financial incentives offered by Entergy influence your decision to build homes to the [Tier 1, Tier 2, or Tier 3] standard?
	On a scale of 0 to 10, where 0 means no influence and 10 means significant influence, how much influence did the Entergy Arkansas New Homes Program have on your decision to build more energy-efficient homes?
Stated Intent	If Entergy did not offer the New Homes Program, how many energy-efficient homes would you have built in the Entergy service territory during 2013? [the same number, fewer, or more homes]
	When you say the same number, what standard would you have built these homes to?*

* The Evaluation Team only asked this question of builders who stated in the previous question they would have built the same number of energy-efficient homes in Energy's service territory during 2013 without the New Homes Program.

The builder's responses to those questions are shown below in Table 48.

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Table 48. Builders Responses

Builder	Question 1 Incentive Influence	Question 2 Incentive Influence Level	Question 3 Stated Intent (number of homes built)	Question 4 Stated Intent (built to what level)
Builder 1	No	6	The same number (incentive and program made no difference)	Tier 1 standard (Special Rate homes)
Builder 2	No	2	The same number (incentive and program made no difference)	Tier 2 standard (High Performance homes)
Builder 3	No	2	The same number (incentive and program made no difference)	Tier 1 standard (Special Rate homes)
Builder 4	No	0	The same number (incentive and program made no difference)	Tier 3 standard (ENERGY STAR-certified homes)
Builder 5	Yes	9	Fewer	N/A
Builder 6	Yes	5	The same number (incentive and program made no difference)	Tier 2 standard (High Performance homes)

Of the six surveyed builders, four said program incentives did not influence their decision to build homes to the program standard. When asked, on a scale of 0 to 10, how much influence the program had on their decision to build more energy-efficiency homes, the average response was 4 out of 10, indicating that contractors perceived the program to have some influence, although slight. When asked how many energy-efficient homes they would build in the absence of the program, all but one builder said they would build the same number of homes. This response further indicated that the program did not have a strong influence on participating builders' decisions to build efficient homes. Finally, to gauge whether each builder would have built homes to a higher, lower, or the same standard the program requires in absence of the program, we asked what building standards they would have followed in absence of the program. Four of six builders indicated they would have built the same number of homes to the same standard required by the program.

The Evaluation Team applied the builders' responses to a decision matrix that has been used to determine freeridership for other utility new construction programs across the country (Table 49). In most jurisdictions, we assign partial freerider scores based on the particular combination of responses to the three freerider questions. However, partial freeridership is not allowed in Arkansas according to the C&EE Rules. Thus, we assigned each builder a freerider score of 0% or 100% based on their responses. A 0% freerider said the program influenced their decision to build energy-efficiency homes, and a 100% freerider said the program had no influence on their decision to build energy-efficiency homes.

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Table 49. Freeridership Matrix

How much did the New Homes Program influence your decision to build more energy-efficient homes? (scale of 0-10)	If Energy did not offer the New Homes Program, how many energy-efficient homes would you have built in the Energy service territory during 2013?		FR Score	FR Scenario #
	Quantity	Efficiency		
8, 9, 10	Fewer		0%	1
	Same	Lower	0%	2
	Same	Similar	0%	3
5, 6, 7	Fewer		0%	4
	Same	Lower	0%	5
	Same	Similar	100%	6
0, 1, 2, 3, 4	Fewer		0%	7
	Same	Lower	100%	8
	Same	Similar	100%	9

We identified builders as freeriders if they scored 100% freeridership based on Table 49. The weighted overall freeridership result of 28% is shown in Table 50.

Table 50. Builder Freeridership

Builder	FR Scenario #	FR Score	Number of Program Homes Built
Builder 1	5	0%	14
Builder 2	9	100%	3
Builder 3	9	100%	1
Builder 4	9	100%	3
Builder 5	1	0%	3
Builder 6	5	0%	1
Total			25
Weighted Average Score		7 / 25 = 28%	

Evaluated Net Savings

The Evaluation Team adjusted *ex post* gross energy savings and demand reduction by the program NTG ratio of 0.72. Table 51 shows the resulting values. These values reflect savings at the point of consumption, and thus do not include line loss.

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Table 51. New Homes Program Net Energy Savings and Demand Reduction

Savings	*Ex Post* Gross Savings*	Net Savings	Net-to-Gross Ratio
Coincident Peak Demand Savings (kW)	75,428	54,308	72.0%
Annual Energy Savings (kWh)	23.4	16.9	72.0%

* The gross energy saving are presented excluding line losses.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Program Performance

Although the national housing market is improving, residential new construction in EAI's territory is not sufficient to support program goals.

The United States Census Bureau reported an 18% increase in new housing construction in 2013 over 2012, and the southern region of the United States saw a 16% increase.[44] In addition, the South saw the greatest market share of single-family new housing construction in the country during 2013. As shown in Table 52, more than 600,000 single-family homes started construction in the United States in 2013, the majority of which (53%) are located in the South.[45]

Table 52. 2013 Single-Family Housing Starts by Region

Region	2013 One-Unit New Housing Construction	Market Share
Midwest	102,300	17%
Northeast	55,100	9%
South	325,900	53%
West	134,600	22%
Total	617,900	100%*

Source: U.S. Census Bureau and U.S Department of Housing and Urban Development. "New Residential Construction in December 2013." Last modified January 17, 2014. Accessed January 17, 2014. http://www.census.gov/construction/nrc/pdf/newresconst.pdf.

* Data may not sum precisely due to rounding.

Although the housing marketing across the United States and specifically in the South improved in 2013, the housing market in Arkansas did not experienced the same increase. According to data provided by

[44] The United States Census Bureau categorizes the following 17 states (and district) as being the southern region of the United States: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

[45] State-specific census data was not available as of January 14, 2014.

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EAI staff, just over 3,500 temporary meter requests were filed with EAI for single-family home construction projects during 2013. To determine how many of those requests could be identified as probable single-family new housing construction, the Evaluation Team analyzed a random sample of 200 meter requests using Microsoft MapPoint® and Google Earth images. We found that only 39% of the temporary meter requests filed with EAI could be identified as single-family new housing construction. Therefore, just under 1,400 of the temporary meter requests filed with EAI during 2013 were for single-family new housing construction projects, which means that less than 1% of the single-family new housing construction reported in the South were located in EAI's service territory.

EAI staff reported the biggest challenge facing the program is Arkansas' weak housing market. Arkansas has a small population that includes a high percentage of income-limited households, and a low volume of new home builders, especially production builders. Similar to 2012, ICF staff reported having difficulty with New Homes Program outreach in EAI's territory during 2013 because there are so few production builders in Arkansas; many are small companies that build a low volume of homes in a given year.

ICF staff reported that 13 builders were enrolled as New Homes Program partners. According to ENERGY STAR, there were only 18 ENERGY STAR for Homes program partners in the State of Arkansas, six of which are currently enrolled in the New Homes Program.[46] However, only seven of the 13 enrolled program partners built qualifying homes through the program in 2013. The Evaluation Team interviewed seven of the 13 enrolled participants, and none represented a large production builder. In total, these seven interviewees built 39 homes in 2013, including non-program homes and homes outside EAI's service territory (Table 53).

Table 53. Business Characteristics by Participant Builder

Interviewed Builders	Employee Count	2013 Total Homes Built	2013 Program Homes
Builder 1	32	16	13
Builder 2	17	5	0
Builder 3	3	7	2
Builder 4	1	4	2
Builder 5	1	4	1
Builder 6	1	2	0
Builder 7	1	1	1
Total	56	39	19*

* The Evaluation Team was unable to reach two of the participating builders who submitted program homes. These two builders submitted the remaining three participating homes.

[46] ENERGY STAR. "New Homes Partners in Arkansas." Accessed January 14, 2014. https://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showStateResults&s_code=AR&show=none . Not all of the ENERGY STAR program partners participate in the New Homes Program and vice versa.

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Program Design

The Special Rate incentive tier did not expand participation to the low-income sector.

To capitalize on some low-income housing developers' interest in the program in 2012, New Homes Program staff added a third incentive tier to encourage builders working on ADFA low-income housing projects to participate in the New Homes Program. With the New Homes Program Special Rate tier, EAI offered a $300 incentive for each home built to save at least 15% more kWh than the ADFA minimum efficiency requirements. The new incentive tier was intended to supplement the ADFA grant money, increasing the overall subsidy available for the home. However, during 2013 no homes qualified for the $300 Special Rate incentive.

Arkansas' pending adoption of 2009 IECC will reduce the program savings potential.

The current Arkansas Energy Code is based on the 2003 IECC, with State-specific amendments. However, according to New Homes Program staff, Arkansas is currently working towards adopting 2009 IECC for the residential sector.

When the State adopts 2009 IECC, it will become the savings baseline for the New Homes Program, and the potential per-home savings will drastically decrease under the newer eligibility requirements. For example, currently the New Homes Program's highest incentive tier (which follows ENERGY STAR version 3.0 guidelines) requires that homes be at least 20% more energy efficient than homes built to 2009 IECC, and tiers 1 and 2 would be less than and equal to code, respectively. Both EAI and ICF expressed concern that Arkansas' adoption of 2009 IECC would deem the New Homes Program obsolete.

An innovative program design could stimulate greater program participation.

In an effort to attract more builders to the program, ICF staff reported they want to revamp the program incentive structure. The interviewed participant builders suggested that improving the incentive structure could attract more builders. Only two of the interviewed participants said the program's current incentives are sufficient to encourage homebuilders to build new homes to a higher efficiency standard; the remaining five builders reported that New Homes Program incentives are not large enough to encourage builder participation. Roughly half of the interviewed builders (four of seven) indicated higher rebates as the best way to generate greater program participation.

According to ICF, the New Homes Program is not effective due to minimal participation, and due to being ineffective the incentives cannot be raised that would encourage greater participation. Furthermore, the program is not cost-effective, which would be further diminished by increasing program costs. However, ICF staff discussed various potential design changes for the New Homes Program, including both prescriptive and performance-based program models.

Table 54 lists five utilities that have adopted prescriptive and/or performance-based program models for their residential new construction programs. As indicated in the table, a prescriptive incentive structure allows builders to qualify for incentives on a per-measure basis. Performance-based program models

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offer tiered incentives based on the savings achieved by the completed home compared to a baseline home. The savings are determined using modeling software.

Table 54. Comparison of Residential New Construction Program Models

Program Sponsor	Program	Incentive Model	Incentive Structure	Requirements
EAI	Entergy Arkansas New Homes Program (2013)	Tiered and Performance	Special Rate = $300/ home	≥ 15% kWh saved over ADFA
			High Performance = $600/ home	ENERGY STAR 2.5
			ENERGY STAR certification = $1,000/ home	ENERGY STAR 3.0
Entergy Texas	Energy Solutions High-Performance Homes Program (2013)	Performance	All homes = $0.10 per KWh saved over baseline	2009 IECC/ 2009 IRC
			Bonus 10% savings = $100/home	
			Bonus 15% savings = $150/home	
			Bonus 20% savings = $200/home	
			Bonus 30% savings = $300/home	
			Bonus ENERGY STAR certification = $100/home	
Georgia Power Company	EarthCents New Market Program (2014)	Prescriptive and Performance	Electric comfort systems (HVAC and water heating measures) = $100-$250/system	Based on SEER
			EarthCents New Home= $600/home	HERS Rating ≤ 77
			Bonus = $25/point below 77 on the HERS Index	
Public Service Company of Oklahoma (PSO)	High Performance Homes Program (2013)	Performance	All homes = $0.50 per KWh saved over baseline	2009 IRC
			Bonus 10% savings = $200/home	
			Bonus 15% savings = $250/home	
			Bonus 20% savings = $300/home	
			Bonus 30% savings = $350/home	
			Bonus ENERGY STAR certification = $100/home	
Santee Cooper	Smart Energy New Homes Program (2014)	Tiered and Prescriptive	Equipment pathway (HVAC and water heating measures) = $50-$300	Based on SEER
			Tier 1 = $800/home	HERS Rating ≤ 85
			Tier 2 = $1,600/home	HERS Rating ≤ 75
			Tier 3 = $3,000/home	HERS Rating ≤ 65
			Bonus ENERGY STAR certification = $100/home	ENERGY STAR 3.0

ICF reported that Entergy Texas and PSO have had particular success since implementing their residential new construction programs with performance-based models. Specifically, PSO achieved the

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ENERGY STAR Partner of the Year award several years in a row (2010-2013) for successfully growing the Oklahoma market for ENERGY STAR-qualified homes. According to ENERGY STAR, PSO's program achieved an 18% market penetration of ENERGY STAR-qualified homes in their service territory during the program's first year.[47]

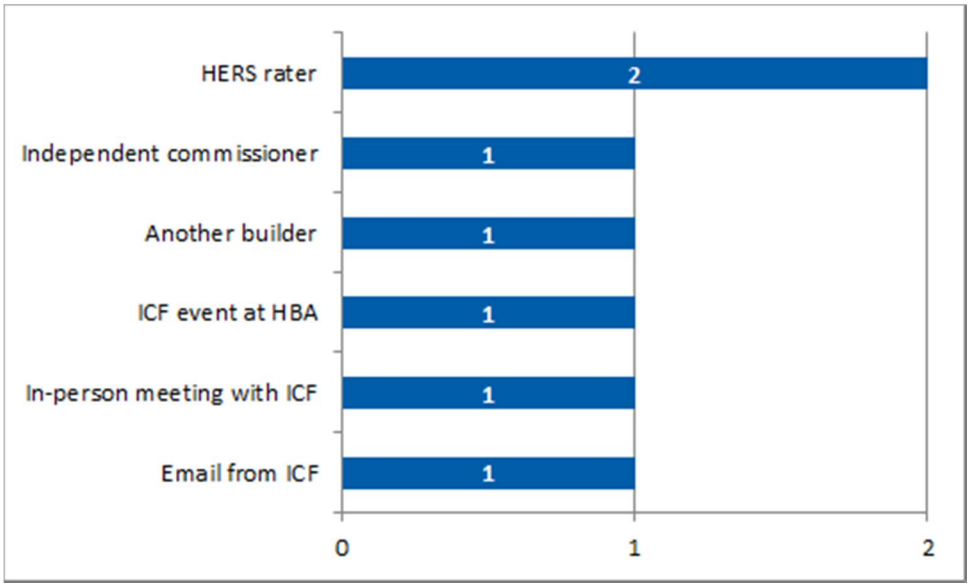
Both EAI and ICF staff reported that they will likely transfer the New Homes Program to a performance-based model in 2014. According to ICF, an added benefit of moving to the performance-based model is that it could support Arkansas' impending baseline change to 2009 IECC. As indicated in Table 54 above, both the Entergy Texas and PSO programs are successful under increased baselines (both follow the 2009 IECC and 2009 IRC).

Outreach and Training

ICF increased direct outreach efforts during 2013; however, this outreach does not seem to be reaching the appropriate builder population.

According to ICF, they maintain a database of nearly 500 building sector contacts that they use to conduct marketing activities. As in 2012, ICF said their grassroots marketing approach (phone calls, email, in-person meetings, and events) worked well to increase program awareness. However, as Figure 18 shows, four of the seven interviewed participants first heard about the program through word-of-mouth from industry peers while the remaining three participants reported learning about the program through ICF staff.

Figure 18. Sources of New Homes Program Awareness



QC1. How did you first hear about Entergy Arkansas' New Homes Program? (n=7)

[47] ENERGY STAR. "Public Service Company of Oklahoma (PSO) ENERGY STAR Partner of the Year." Accessed January 14, 2014. http://www.energystar.gov/index.cfm?fuseaction=pt_awards.showAwardDetails&esa_id=4176

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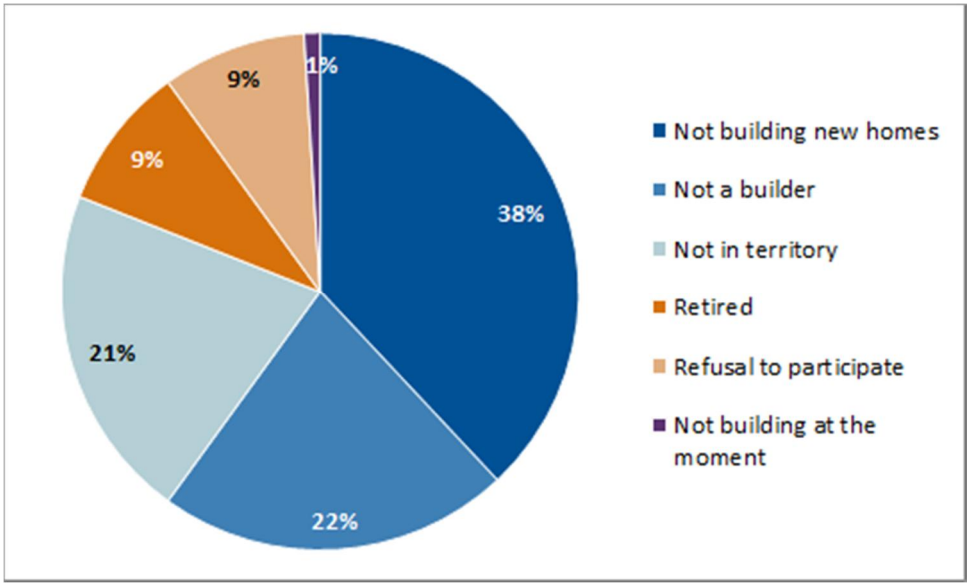
Although ICF staff reported ramping up direct outreach to builders in 2013 via telephone calls, none of the participating builders reported hearing about the New Homes Program in this way. All seven interviewed builders reported email as their preferred method of receiving program information.

As recommended in the 2012 evaluation, ICF reported that they updated the builder database in 2013 to eliminate builders that are not active in Arkansas or that are otherwise not inclined to participate in EAI's program. However, as shown in Figure 19, the Evaluation Team determined that 90% of the nonparticipants on ICF's list are either not residential home builders (not building new homes, not builders, or retired) or are not located in EAI's service territory, making them unlikely potential participants.

Figure 19. Reasons Builders Decline to Participate



Source: Program recruitment data submitted by ICF. (n=78)

ICF staff said they used the list of temporary meter requests filed with EAI to identify potential participants. Using that same temporary meter request list, the Evaluation Team mapped probable single-family new construction from a random sample of 200 requests filed in EAI's territory during 2013. As mentioned above, only 39% of requests were identified as probable single-family new construction. Figure 20 shows that the highest concentration of single-family new construction in EAI's territory during 2013 was located in Pulaski County, Garland County, and White County.

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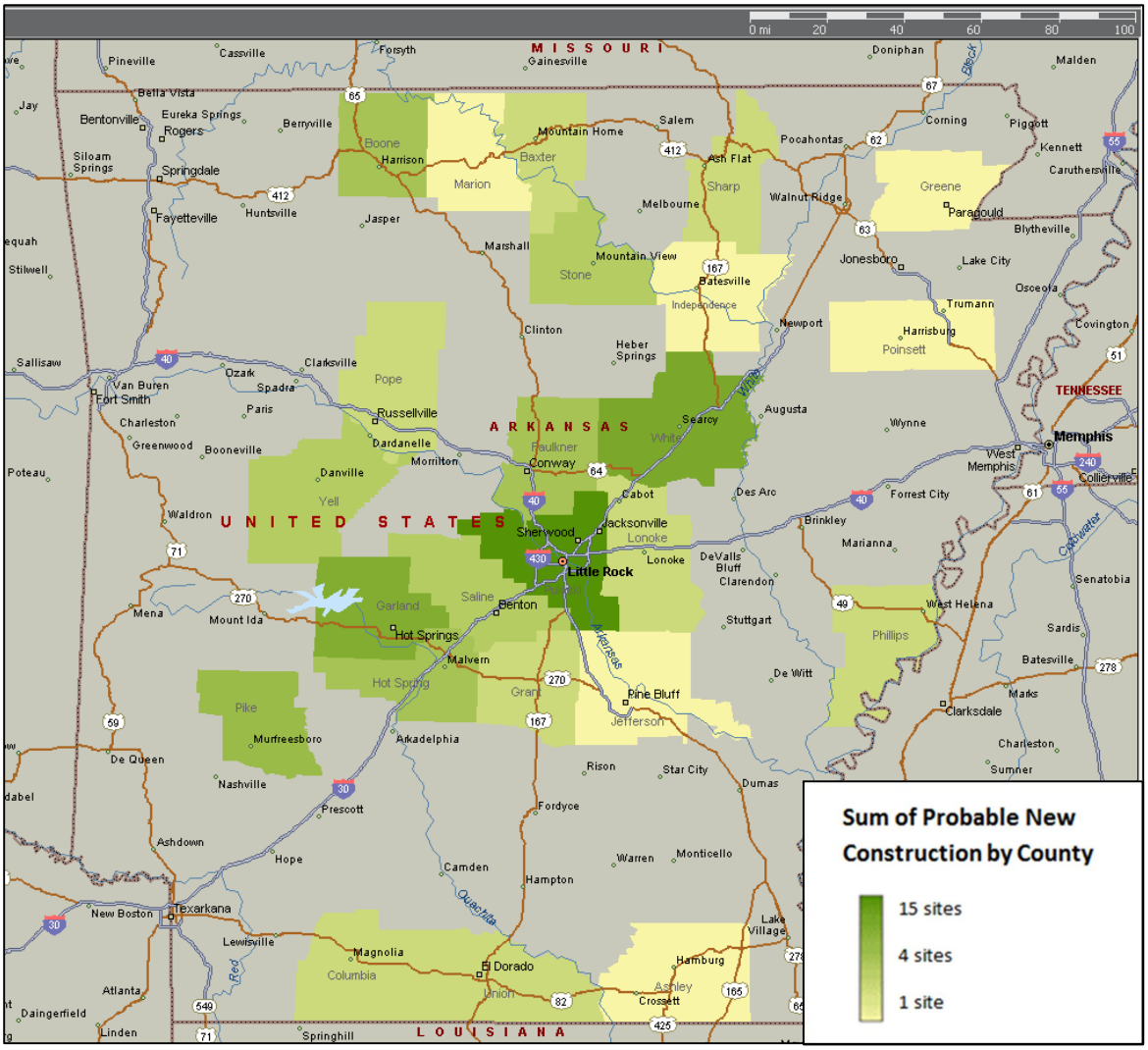
Figure 20. Probable 2013 Single-Family New Construction by County



Recruitment training is not successfully generating greater program participation, but it is highly effective at increasing builders' program understanding.

ICF staff reported offering builder training at the beginning of 2013, but did not conduct any additional training in the latter half of 2013 because of budget limitations.

ICF used trainings as a recruitment tool. According to ICF, they focused the training content primarily on the New Homes Program requirements and technical knowledge, such as compliance with ENERGY STAR guidelines and 2009 IECC. In response to the Evaluation Team's 2012 recommendations, ICF developed a follow-up protocol with builders who attend training: ICF called builders to provide support and answer any additional questions they may have about the program.

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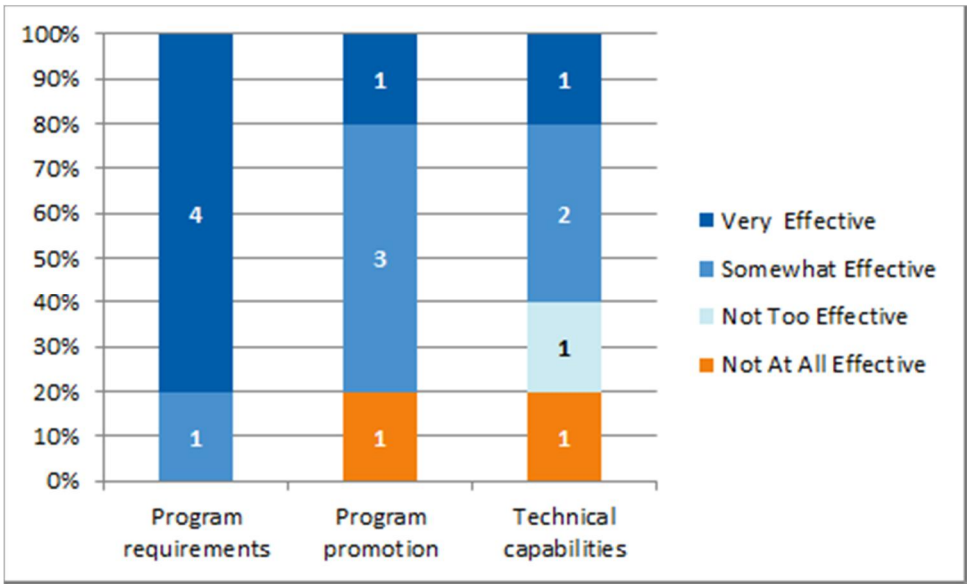
In spite of these efforts, the number of actively participating builders decreased from 15 in 2012 to 13 in 2013. Additionally, only seven of the 13 participants submitted homes that qualified for program incentives in 2013, compared to all 15 participants in 2012.

Five of the seven interviewed builders reported attending ICF's program orientation training where they learned New Homes Program information and requirements. Two of these five builders also reported attending code training where they learned about building and energy code compliance, and one of the five builder reported attending sales and marketing training.

As shown in Figure 21, most of the interviewed builders who attended program training thought the program understanding, sales and marketing, and technical aspects were effective. The builders who rated the trainings' technical aspects as less effective reported they were already familiar with ENERGY STAR building requirements.

Figure 21. Participant Builders' Ratings on Program Training Effectiveness



Multiple survey questions, see Appendix A

One builder recommended improving the training by offering more opportunities online. Other builders suggested providing more hands-on training materials and increasing marketing training opportunities.

ICF staff also reported conducting increased realtor and appraiser trainings in 2013, noting it may be beneficial to provide networking and training opportunities for builders and realtors together in future program years.

Program Delivery and Implementation

Despite decreased program funding, New Homes Program management continued to run smoothly.

Due to the low level of participation in 2012, EAI staff shifted $100,686 of the New Homes Program's 2013 budget to the Energy Solutions for Multifamily Program. Both EAI and ICF staff reported that the

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remaining $539,314 in the New Homes budget was sufficient for the 2013 program year. However, ICF indicated that this remaining budget was not enough to offer builder training in the latter half of the program year. EAI staff expressed doubt that a larger budget would have made a difference in program participation, since Arkansas' weak housing market continues to be the program's greatest challenge.

As in 2012, during 2013 EAI and ICF continued to communicate weekly about program implementation issues, and both parties reported high satisfaction with their working relationship.

Slow incentive processing challenged the New Homes Program delivery.

ICF staff reported the New Homes Program incentive processing was much slower than for similar, utility-sponsored residential new construction programs. According to EAI, they expected the wait time for a builder to receive their incentive to be six to eight weeks, but in reality only one participant received their check in this time frame.

Builders submit their final documentation and an invoice for the participating home to ICF. ICF is required to invoice EAI for incentive payments. Once EAI pays the invoice, ICF staff fulfills builder incentive payments. ICF staff reported that this invoicing process slows down the incentive wait time. ICF staff noted that when implementing similar programs, the sponsoring utility provides them with an incentive account at the beginning of each program year from which they draw incentive payments directly. According to ICF, having direct access to an incentive account allows them to issue incentive payments to builders very quickly—sometimes as fast as the day after the builder submits their final home documentation.

Table 55 compares the interviewed builders' satisfaction with the amount of time they waited to receive their incentive payment to the amount of time they reported waiting. As mentioned, only one of the six participating builders who had submitted their final documentation for invoicing received their incentive within eight weeks. This was the only participant who was satisfied with the amount of time they waited for their incentive. The remaining builders reported dissatisfaction with the incentive processing time.

Table 55. Participant Builders' Satisfaction with Incentive Processing by Wait Time

Satisfaction Level	Less Than 8 Weeks	More Than 8 Weeks	Have Not Received Payment Yet	Total
Very satisfied	-	-	-	-
Somewhat satisfied	1	-	-	1
Not too satisfied	-	1	-	1
Not at all satisfied	-	2	1	3
Did not answer	-	-	1	1
Total	1	3	2	6

QJ2. How many weeks did it take to receive the rebate check from Entergy? (n=6); QJ3. How satisfied were you with the amount of time you waited to receive your rebate payment? (n=6).

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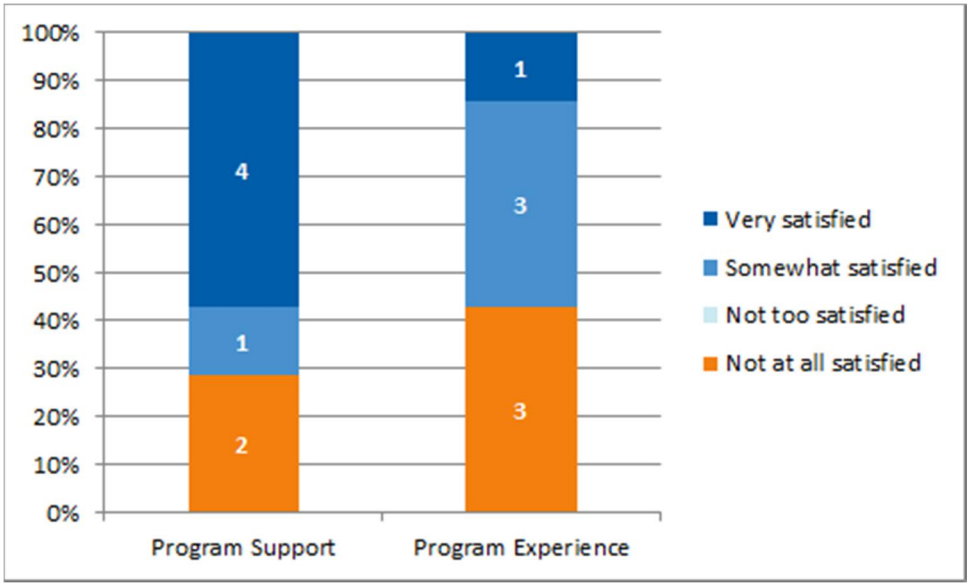
At the time of the interviews, two of the builders had not yet received their incentive payments. One builder reported it had been eight weeks since they submitted their final paperwork; the other builder reported they had been waiting for their incentive for 36 weeks. This builder was not listed in the program data as having completed a participating home during 2013, so it is likely this participant's home did not meet the program requirements to qualify for a program incentive. However, at the time of the interviews this builder had not been informed that their home had not qualified for an incentive.

Trade Ally Response

Program satisfaction among participating builders was mixed.

Figure 22 illustrates interviewed builders' satisfaction with the program support offered by ICF and with their program experience overall. Although most of the builders were satisfied with both aspects of the New Homes Program, a notable number of builders reported being not at all satisfied. Builders cited the complicated incentive process as the root cause of their frustration.

Figure 22. Participating Builder Satisfaction



Multiple survey questions, see Appendix A

There are various stakeholders involved in completing a program home: the builder, the HERS rater, and HVAC and plumbing subcontractors. In regards to working with other program stakeholders, all seven interviewed builders reported it was easy to work with HERS raters to get program homes tested and certified. Five of the seven builders reported it was easy to get the required program paperwork, checklists, and data from their subcontractors. One of the builders who reported it was not easy to get program-required information from their subcontractors said their HVAC subcontractors did not like the increased ENERGY STAR requirements.

Figure 23 shows challenges builders reported as a result of participating in the New Homes Program. Builders cited the lengthy incentive processing time and weak housing market as challenges to their

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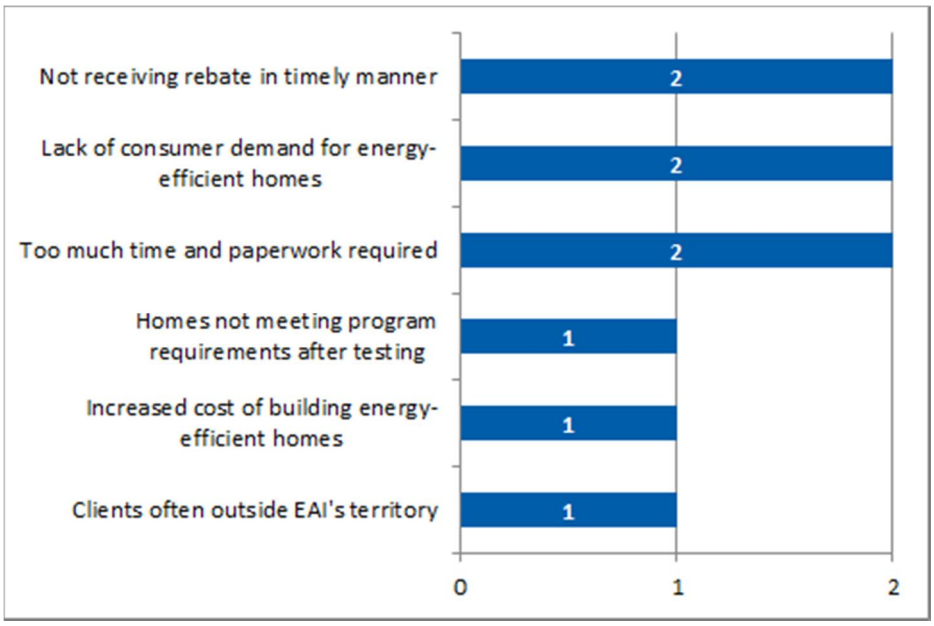
participation (each mentioned by two builders). Two participants also reported that the program requirements increased their administrative burden.

Figure 23. Builder Participation Challenges



QG12. What challenges, if any, have you experienced as a result of participating in the New Homes Program? (n=7)

A shown in Figure 24, builders most commonly reported (three of seven) that building a higher quality home for the homebuyer is the biggest benefit of building an energy-efficient new home. Two participants cited their competitive advantage over other builders as a benefit.

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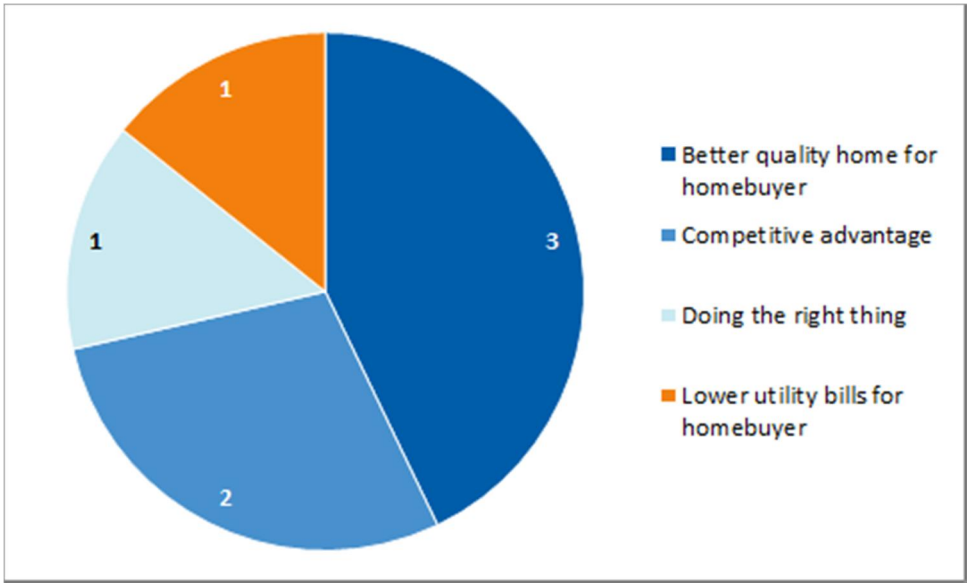
Figure 24. Builder Benefits of Constructing Energy-Efficient Homes



QJ4. As a homebuilder, what is the biggest benefit of building an energy efficient new home? (n=7)

Evaluation Recommendations

Recommendations for the New Homes Program are included below.

Revisit the program design and incentive levels to attract new builders.

Consider innovative program models to generate greater interest in participation. In an effort to attract more builders to the program, ICF staff reported they want to revamp the program incentive structure. The Evaluation Team's participant survey indicated that for most (5 of 6) builders, the incentive had no impact on their building practices; they would have built the same number of homes to the same standard without the incentive. These findings resulted in a higher freeridership rate than expected, indicating that the program's incentive levels may be insufficient to influence builders' decisions to build to a higher energy-efficiency standard. Interviews with participant builders suggested that improving the incentive structure could attract more builders as well as reducing program freeridership.

ENERGY STAR estimates that building to ENERGY STAR 3.0 has a $2,124 - $2,667[48] incremental cost in jurisdictions already building to IECC2009. Arkansas is currently building to IECC2003 standards; its lower efficiency requirements likely lead to even higher incremental costs than ENERGY STAR's estimates would indicate for builders who build to ENERGY STAR 2.5 and 3.0 standards in Arkansas. Thus, the New Homes Program's $600-$1,000 incentives may not be sufficient to encourage builders' participation.

[48] http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/EstimatedCostandSavings.pdf

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Suggestions for Improvement

In addition to the recommendation noted above, the Evaluation Team identified the following tactical suggestion for improvement for the New Homes Program.

Enhance builder engagement.

Although the number of qualifying homes per year increased from 15 in 2012 to 22 in 2013, the number of actively participating builders decreased from 15 in 2012 to seven in 2013. With a lack of production builders located in Arkansas, it is critical for EAI and ICF to expand their program recruitment and support efforts. Reach out directly to the ENERGY STAR for Homes program partners operating in Arkansas and discuss the challenges they are facing in building qualified homes through the New Homes Program.

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Residential Lighting and Appliances Program

With the Residential Lighting and Appliances Program, EAI offers discounts and rebates through participating retailers for a suite of energy-efficient products. The program implementer, CLEAResult, pays incentives directly to manufacturers or retailers for measures sold through the POP delivery model; these measures are ENERGY STAR standard CFLs, specialty CFLs, compact fluorescent fixtures, ceiling fans, and window air conditioners. For ENERGY STAR refrigerators, customers mail a rebate form to CLEAResult. Advanced power strips (APSs) are primarily distributed directly to customers at events and through campaigns at customers' workplaces as a give-away.

Program Status Overview

The Lighting and Appliances Program surpassed its participant, energy savings, and demand reduction goals in 2013 (see Table 56) all while underspending its program budget by 36%.

Table 56. Lighting and Appliances Program 2013 Goals vs. Actual

	Goal	Actual	Percent of Goal Achieved
Energy Savings (MWh)*	25,818	32,032	124%
Demand Savings (MW)*	3.4	6.2	181%
Participation (measures)	905,778	1,404,805	155%
Budget	$4,447,447	$2,868,407	64%

* These values represent evaluated net savings and reflect the application of an 8.49% line loss factor.

Although CFLs continued to dominate the program, accounting for 97% of the program savings, CLEAResult staff tried to expand the number of retailers carrying non-CFL measures by introducing and promoting a selection of new program measures. In addition, to mitigate the effects of leakage, program staff stopped offering CFLs at select retailer locations.

Status of 2012 Evaluation Recommendations

Table 57 shows the status of each of the Residential Lighting and Appliances Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed many of the 2012 recommendations during the 2013 program year.

Table 57. 2013 Status of 2012 Residential Lighting and Appliances Program Recommendations

2012 Recommendation	2013 Status
Focus on getting refrigerators, window air conditioners, compact fluorescent fixtures, ceiling fans, and APSs into more retail locations. Continue to identify and address barriers to working with retailers, especially those with a large customer reach in EAI's territory.	*Completed.* Implementation staff increased the number of retailers that work with the program for two of the non-lighting cost-effective measures, increasing the retailers for refrigerators from one to four, and for window air conditioners from one to two.
Consider disaggregating the implementer's savings targets by measure category, and ramping up non-	*Completed.* Program staff established measure targets based on a percentage of program savings.

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2012 Recommendation	2013 Status
lighting measures over time to help the program transition to a post-Energy Independence and Security Act of 2007 (EISA) environment.	
Increase marketing and outreach for non-CFL measures. Provide materials that direct customers to the program website to find retail locations offering available program measures.	*Completed.* Implementation staff increased marketing and outreach for non-CFL measures, including sending LED and window air condition direct mailers to EAI customers.
Request detailed measure-level sales data from retailers to aid with the ongoing evaluation of program NTG and customer purchasing trends.	*Completed.* Implementation staff requested detailed data from all retailers; however, not all retailers complied.
Revise/amend the MOUs to require that manufacturers and retailers participate in program evaluation activities, including but not limited to requiring that they provide itemized sales data and make staff available to participate in evaluation surveys or interviews.	*Completed (Considered/Rejected).* Staff decided not to include additional requirements regarding data or evaluation activities in the legal agreements with retailers.
Investigate offering limited-time promotions with higher incentives for seasonal measures (ceiling fans and window air conditioners) in the late spring or early summer and higher incentives for other measures during slower program periods.	*Completed.* Program staff offered a one-month promotional rate on fixtures at a big-box store during April 2013. Staff chose not to offer a promotional rate for window air conditioners, as they did not have an opportunity to manipulate incentives during the limited three-month promotional period.
Increase the emphasis on opportunities that provide customer touch points to educate them about APSs (through in-store demonstrations, home shows, and employer campaigns).	*Completed.* Implementation staff increased the number of outreach events by 110% over 2012. Over 90% of these events included APS demonstrations or giveaways.
Continue to focus on partnering with retailers to sell APSs that provide a high level of assistance and education to customers.	*Completed (Considered/Rejected).* Program staff determined that APS units are not cost-effective under TRM Version 2.0. Although they are cost-effective under TRM Version 3.0, that version was approved too late in the year to get the measure into retail stores.
Once APS retailer channels are established, consider providing regular in-store demonstrations. Offer limited-time promotions that include a deeper discount in conjunction with in-store demonstrations.	
Investigate a midstream approach that incentivizes stores to sell APSs. This could include sponsoring competitions between stores or offering prizes (or an entry into a drawing) for staff that sell the most units.	
Explore using a video demonstration kiosk or display at retail locations to educate customers about the proper use and benefits of the APS technology. Post the video to the program website, YouTube, and/or other media channels.	*Completed.* Program staff determined that retailers would not allow videos to be placed in stores. Program staff plan to explore posting a third-party video to the program website or Facebook page.
Conduct targeted marketing to specific demographic	*Completed (Considered/Rejected).* EAI chose not to

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2012 Recommendation	2013 Status
groups that would benefit the most from the APS technology (e.g., young families, tech-savvy professionals).	directly target specific demographic groups for the APS units, because they determined the measure is not cost-effective under TRM Version 2.0. Program staff plan to integrate online sales of the units accessible from the program webpage.
Investigate offering a stand-alone refrigerator recycling program through a qualified third-party provider. Refrigerator recycling programs are very popular in other jurisdictions, are highly cost-effective, and generate substantial energy savings.	*Completed (Considered/Rejected).* Program staff investigated the costs associated with a third-party program and determined it is outside of the program budget, and requires an amendment to the current filing to implement. Therefore, staff decided that offering a stand-alone refrigerator recycling program is not feasible at this time.
Consider requiring the pickup/delivery subcontractor to enter into a legally binding contract with stipulated protocols for delivering program units for recycling. Provide performance incentives when the number of recycled refrigerators is comparable to the number of customer rebate applications signed by their staff.	*N/A.* Program staff changed participation requirements in the third quarter of 2013 so that refrigerator removal or recycling was no longer required.
If EAI chooses to resume the refrigerator rebate measure in this program, add clear, step-by-step instructions for the program recycling process to the ENERGY STAR Refrigerator Process Flowchart in the Operations Manual.	
Promote program-discounted bulbs through bill inserts, the program website, and mass media advertising.	*Completed.* Implementation staff promoted the program through direct mail, the program website, print ads, radio interviews, retail POP signage, events, presentations, cooperative social media with retailers, education and outreach, and retailer training.
Continue to promote the program through a combination of marketing channels.	
Create a mechanism, through the program website or sign-up sheets at outreach events, allowing customers to sign up to receive measure-specific information. This would allow EAI to capture key target marketing data and send measure-specific messaging to customers without overwhelming them with potentially irrelevant general marketing.	*In Progress/Partial.* Implementation staff adapted the current lead card to include program measures, but could not send follow-up emails to customers due to a lack of budget. CLEAResult intends to develop and leverage a data collection form on the program webpage that allows customers to sign up to receive information about specific measures.
Make the program webpage more interesting to visitors by adding real success stories, quotes, retailer event images, and more color.	*Completed.* Implementation staff revised the Residential Lighting and Appliances Program webpage based on these 2012 recommendations.
Consider making the program page more user friendly by listing measures at the top of the page and having links on the side bar; avoiding industry jargon and simplifying the message; and providing links with	

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2012 Recommendation	2013 Status
additional information.	
Consider making the call-to-action button on the website stronger by using headlines or web buttons.	
Continue to have the EAI staff interact with the retail sales staff as much as possible whenever they visit the stores.	*Completed.* Implementation staff visited participating retail stores at least once per month, and engaged sales associates whenever possible.
Revise the APS Process Flowchart to include all delivery models (e.g., through employers, at events).	*Incomplete.* Implementation staff did not revise the Program Manual to reflect that APSs are provided as giveaways at events.
Add step-by-step instructions for managing the customer purchase, measure delivery, and rebate process for APSs and other measures sold at events, campaigns through employers, or other alternative delivery mechanisms.	*NA.* Implementation staff no longer sells APSs, or any other measure, at events. Once EAI launches online sales, the implementation staff will add information to the Operations Manual on tracking giveaway measures.
Consider revising the Operations Manual to include the following key elements: • Define the database systems introduced by both CLEAResult and EAI during 2012. Include information on the database systems' applications, users, and when the systems should be applied. Include program staff contact information. • Define all acronyms in the program materials, including APS, EE, M&V, and NIGO.	*Completed.* CLEAResult revised the Operations Manual to include the required information about the database systems introduced by both CLEAResult and EAI during 2012. It also now defines the acronyms indicated in the recommendations.
Work with the retailers to facilitate opportunities for in-store customer surveys. Other utilities have had some success conducting customer surveys in conjunction with in-store demonstrations or education events.	*Completed.* Program staff asked retailers to conduct in-store customers surveys, but requests were denied.
Explore ways EAI could assist retailers that have challenges providing required data with managing the program tracking and reporting requirements.	*Completed.* Implementation staff began working with manufacturers instead of directly with the particular retailers who were having trouble providing the required data, eliminating the program reliance on those retailers for program tracking and reporting.
Consider ways to simplify the program administration process for retailers.	
If EAI re-introduces refrigerators into the program, capture and report data required to apply the TRM 2.0 savings values in the program tracking database.	*Completed.* Program staff redesigned the rebate application form to request information on the customer's old unit.
Collect customers' contact information and get basic data from customers who receive free measures at giveaway events to facilitate NTG analysis.	*Completed.* Program staff collected information from customers who received giveaways at events. They uploaded this data to the EAI database, which they used to confirm customers' status before giving away free measures. This data was then applied to the NTG analysis.

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Analysis Methodology

For the Lighting and Appliances Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.

- Year End Interviews
  - Utility Program Manager[49](n=1)
  - Implementation Program Manager (n=1)
- Marketing Review
- Condensed CFL Benchmarking Analysis
- TRM Review and Engineering Analysis
- Residential Light Logging Study (n=63)
  - Hours-of-Use Analysis
  - Interactive Effects Factor Analysis
  - Coincidence Factor Analysis
  - In-Service Rate
- Lighting Leakage Study
- Price Response Model for Lighting Attribution

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the Residential Lighting and Appliances Program, which consisted of a tracking database review, TRM-based savings calculation, light logging study, and NTG analysis.

The program surpassed its energy-savings goal of 25,818 MWh, achieving 124%, based on net evaluated energy savings (Table 58). The program also surpassed its peak coincident demand reduction target by 81%, achieving 6,199 kW (Table 59). The values in these tables reflect an upward adjustment of 1.0849% to account for line losses from the point of generation to the point of savings.

[49] During the fourth quarter of 2013, EAI transitioned the utility program manager position to a new staff member, who officially took over in mid-January 2014. The Evaluation Team interviewed the 2013 program manager. However, due to scheduling conflicts we were unable to interview the new manager.

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Table 58. Lighting and Appliances Program Net Energy Savings Results*

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
25,818	32,032	124%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 59. Lighting and Appliances Program Demand Reduction Results*

Demand Reduction Goal (kW)	Net Evaluated Demand Reduction* (kW)	Percent of Demand Goal Achieved
3,430	6,199	181%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor.

Review of Program Tracking Data

The Evaluation Team conducted a desk review of the program tracking data to ensure that appropriate values and formulas from the TRM were applied to accurately calculate savings for each measure.

Evaluated Gross Savings Analysis and TRM Review

The Team evaluated each of the measures using Arkansas TRM 3.0 unless the measure was not present in the TRM or the information necessary for calculation was not available in the program data. When available, the Evaluation Team applied parameter values to the TRM algorithms based on information from primary research. Any deviations from explicit TRM applied savings are highlighted below.

Refrigerators

Program tracking data provided sufficient information to calculate savings using the algorithms and tables in TRM 3.0 (Vol. 2, Sec. 2.4.3) based on the configuration and volume of each unit, and whether the unit has been replaced on burnout or was an early replacement. We did not supplement any TRM inputs for this measure.

Room Air Conditioners

Program tracking data did not provide sufficient information to calculate savings using the algorithms in TRM 3.0, but did provide necessary inputs for TRM 2.0 (Vol. 2, Sec. 2.1.10). The data the Team lacked to calculate savings from TRM 3.0 included information about whether the unit had a reverse cycle and/or louvered sides. We were able to use the savings tables in TRM 2.0 with available data on weather zone and unit size. We did not supplement any TRM inputs for this measure.

Advanced Power Strips

Program tracking data provided sufficient information to calculate savings using the deemed savings tables in TRM 3.0 (Vol. 2, Sec. 2.4.4). We did not supplement any TRM inputs for this measure.

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Lighting

The Team evaluated the lighting measures using Arkansas TRM 3.0. When available, we supplemented parameter values with information collected through primary research. The deviations from explicit TRM-applied savings are listed below (full details on our methodology and results for these variables follow).

- *HOU, IEF, and CF:* The Evaluation Team produced values for each of these inputs based on the whole-home lighting inventory study that took place from April 2013 through November 2013.
- *ISR:* The Evaluation Team estimated a first-year ISR based on the whole-home lighting inventory study. We used second-year and third-year ISRs in conjunction with a discounted future savings approach to account for savings from all incented lamps sold in the program year.
- *EISA Baseline Phase-In:* The Evaluation Team enforced EISA baselines in accordance with TRM guidelines, which delay the baseline reduction six months beyond the legislated impact date.
- *Residential/Commercial Split:* The Team used a weighted savings approach to account for lamps purchased through the upstream program that are installed outside of the home, such as lamps installed in businesses. The weighting designates 95% to residential savings and 5% to commercial savings.

The energy saving equation (TRM 3.0, Vol. 2, Sec. 2.5.1), was:

$$kWh = ((W_{base} - W_{post})/1{,}000) \times HOU \times ISR \times IEF$$

The Evaluation Team used the inputs shown in Table 60 and Table 61.[50]

Table 60. CFL Inputs Used by 2013 Evaluation Team

Input	Residential	Commercial	Overall
Weight	95%	5%	100%
HOU	2.17	10.23	2.58
ISR Year 1	92.60%	92.60%	92.60%
ISR Year 2	3.20%	3.20%	3.20%
ISR Year 3	3.20%	3.20%	3.20%
IEF_e	0.97	0.98	0.97
IEF_d	1.25	1.2	1.25
IEF_g	-0.0063	-0.004	-0.0062
CF	0.1	0.77	0.13
Days / year	365.25	365.25	365.25

[50] W_{base} and W_{post} in the equation represent pre- and post-treatment bulb wattages and inputs may vary based on the measure(s) installed.

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Table 61. LED Inputs Used by 2013 Evaluation Team

Input	Residential	Commercial	Overall
Weight	95%	5%	100%
HOU	2.17	10.23	2.58
ISR Year 1	92.60%	95.0%	92.60%
ISR Year 2	3.20%	2.00%	3.20%
ISR Year 3	3.20%	2.00%	3.20%
IEF_e	0.97	0.98	0.97
IEF_d	1.25	1.2	1.25
IEF_g	-0.0063	-0.004	-0.0062
CF	0.1	0.77	0.13
Days / year	365.25	365.25	365.25

Delta Watts

The Team estimated a delta watts multiplier (ΔWM) for each measure by calculating the average proportional difference in demand between efficient and baseline measures. The Team analyzed lamps sold through the program by applying the following equation to each lamp:

$$\Delta WM = (W_{base} - W_{measure})/W_{measure}$$

Where:

W_{base} = Wattage of the lamp replaced by the new CFL

$W_{measure}$[51] = Wattage of the incented lamp purchased

Since the Lighting and Appliances Program affects the market upstream of the purchase—at the retailer or manufacturer level rather than the homeowner level—the baseline wattage (W_{base}) of the lamp being replaced is not known. Therefore, the Team estimated the baseline wattage by assuming the baseline lamp had the same lumen output as the efficient lamp that was purchased through the program. Table 62 shows the baseline incandescent wattage for a given lumens bin by the product purchase date.

[51] The term "measure" is used here to include bulbs incented under the Upstream Lighting Program.

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Table 62. Incandescent Baselines by Lumens Range

Lumens Range (L)	Incandescent Baseline [W] of CFL or LED			
	Sold Before 7/1/12	Sold On or After 7/1/12	Sold On or After 7/1/13	Sold On or After 7/1/14
0-309	25	25	25	25
310-749	40	40	40	29
750-1,049	60	60	60	43
1,050-1,489	75	75	53	53
1,490-2,600	100	72	72	72
2,601-3,300	150	150	150	150
3,301-4,815	200	200	200	200

This method takes into account EISA's effects on the incandescent baseline and follows the approach recommended in the U.S. Department of Energy's Uniform Methods Project,52 which is a framework and set of protocols for determining the energy savings from energy-efficiency measures and programs.

The overall program-year savings—which includes first-, second-, and third-year savings—is a result of shifting baselines that discount future savings. The Evaluation Team based baseline wattages for first-, second-, and third-year savings on the original sale date of each bulb. We added one year to the original sale date for each of the subsequent two years, and used these "future" sale dates in conjunction with Table 62, above, to evaluate the baseline wattage for the given lumens bin, for that year. For instance, we identified a 60-watt equivalent CFL sold in the first half of the 2013 program year as 60-watt equivalent for the first-year savings calculation. In year two, we again treated this bulb as a 60-watt equivalent because the EISA baseline shift happens in the second half of year two. In year three, the baseline for this lamp shifts from 60 watts to 43 watts. As a comparison, a 60-watt equivalent CFL sold in the second half of the 2013 program year would have baseline wattages of 60 watts, 43 watts, and 43 watts for the calculation of first-, second-, and third-year savings, respectively.

The Team calculated delta watts by analyzing sales data from all lamps incentivized through the program, including lamp description, stock keeping unit (SKU) number, lamp-rated wattage, quantity, and date purchased. The Team obtained lamp lumen values by matching the bulbs' SKU numbers to the ENERGY STAR-qualified lamp product list, which gives the lumens associated with each qualified lamp. The lumens values that we determined from the median lumens of the ENERGY STAR product list incorporated the interpolation equation for CFL bulbs shown in Figure 25. In this figure, each data point is the median lumens for the given wattage of an ENERGY STAR-listed lamp. The Team used a trend line equation to calculate the lumens output for incented bulbs that could not be matched to specific ENERGY STAR-listed bulbs using SKU and model numbers.

52 U.S. Department of Energy National Renewable Energy Laboratory. The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures. 2013. Prepared by Cadmus.

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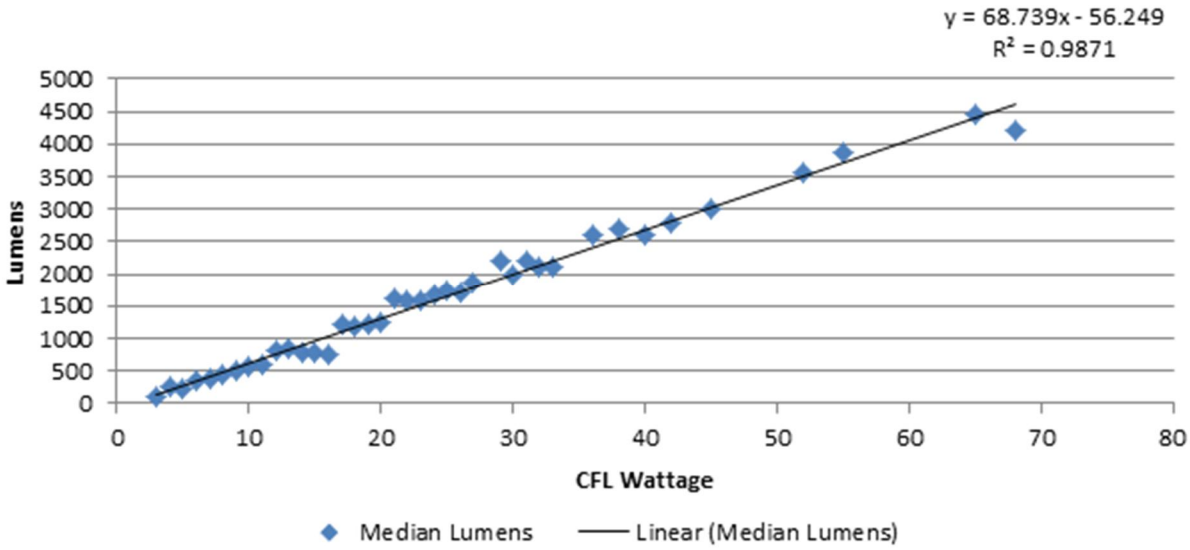
Figure 25. Median Lumens of ENERGY STAR CFL Bulbs



Evaluated Gross Savings

The total evaluated (*ex post*) gross savings for the Lighting and Appliances Program is 58,371,003 kWh, and demand reduction is 11,047 kW. Table 63 and Table 64 show the program participation, claimed (*ex ante*) and evaluated (*ex post*) energy savings, and demand reduction. These values are reported at the point of savings, and thus are net of line losses.

Table 63. *Ex Ante* and *Ex Post* Gross Energy Savings

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
CFLs	34,821,022	57,126,635	164%
Fixtures	96,082	137,083	143%
LEDs	401,831	385,750	96%
APSs	61,600	61,600	100%
Refrigerators	30,021	30,021	100%
Window ACs	629,914	629,914	100%
Total	36,040,471	58,371,003	162%

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Table 64. *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction

Measure	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
CFLs	7,553	10,414	138%
Fixtures	18	25	138%
LEDs	87	70	81%
APSs	8	8	100%
Refrigerators	4	4	100%
Window ACs	526	526	100%
Total	8,196	11,047	135%

The three appliance measures in the program all received realization rates of 100%.

The realization rates of the lighting measures show a marked difference between savings tracked by the utility and the savings calculated by the Evaluation Team. The large realization rate represents the percent change between the *ex ante* and *ex post* savings inputs. In Table 65, a percentage above 100% increases *ex post* savings, other inputs being equal; a value below 100% reduces *ex post* savings, other inputs being equal. The table shows that values for HOU, ISR, IEFd, and CF tend to increase *ex post* savings relative to *ex ante* savings. IEFe, and IEFg tend to decrease savings. For both energy and demand, the combined effect is an increase in savings, but the impact is much larger for energy savings than for demand reductions.

Table 65. Input Values for *Ex Post* Savings as a Percentage of *Ex Ante* Values

% Change	HOU	ISR	Delta Watts	IEF_e	IEF_d	IEF_g	CF
Overall	117%	114%	100%	123%	82%	56%	148%

The overall ISR value shown in Table 65 is a net value that accounts for discounted future installation of lamps that were sold in 2013 and reflects that the Evaluation Team used a higher value than the implementer. In order to account for the savings from lamps installed in the years following the year of purchase, the Team discounted program savings for lamps sold in the 2013 evaluation year and installed in subsequent years using a discount rate of 7.5%. The major discrepancies between tracked savings values and evaluated savings values stem from the Evaluation Team using primary data and weighting savings to account for 5% commercial and 95% residential installations.

Net-to-Gross Analysis

Appliance Component

The Evaluation Team applied the APSC-stipulated value of 0.80 for the three appliance measures.

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Lighting Component

The Evaluation Team used an econometric price response model to develop the freeridership ratio for EAI's CFL measures. Demand elasticity modeling is based on the same economic principle driving program design: that a change in price and promotion generates a change in quantity sold (i.e., the upstream markdown approach). Demand elasticity modeling uses sales and promotion information to:

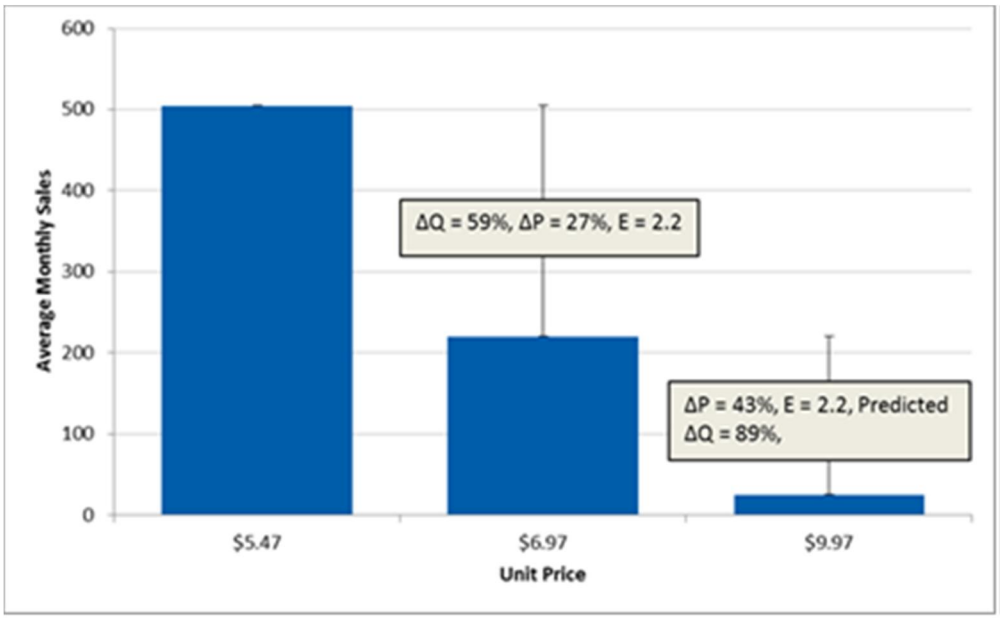
- Quantify the relationship between price and promotion to sales (elasticity)
- Determine the likely level of sales without the program intervention (baseline sales)
- Estimate freeridership by comparing modeled baseline sales with actual sales

The model uses program data on prices, promotional activity, the number of lamps purchased, and lamp and retailer characteristics and then estimates freeridership through the following equation:

$$FR\ Ratio = \left(\frac{Savings\ Weighted\ Sales\ without\ Program}{Savings\ Weighted\ Sales\ with\ Program}\right)$$

Figure 26 illustrates the elasticity (E) calculation with an example based on one lighting product. During the program year, we observed that when the price increases from $5.47 to $6.97, a 27% increase, demand drops by 59%, for elasticity of 2.2. The Team them applied that elasticity to estimate what sales would be at the original price of $9.97, the third bar in Figure 26.

Figure 26. Elasticity Calculation Example



Price elasticity, as shown in the example above, is calculated based on this formula:

$$E_{Price} = \frac{\%\Delta Quantity\ Demanded}{\%\Delta Price}$$

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To calculate elasticity associated with each independent variable affecting program sales, we created a model using known variables: program prices and non-program prices, program promotions, and program period sales. The model applies the relationships within this data to estimate elasticities associated with the independent variables.

Data Collection

The implementer provided the Team with sales data by month for each unique combination of retail location, package, lamp SKU, and incentive level. The Evaluation Team's analysis was based on these data:

- Monthly program sales by product model, program incentive and other store discount, and final discounted price by retail store
- Store display type by retail store over the program period
- Store promotional or educational events and date
- Any other specific promotional event by date and store type

The implementer provided the Team with sales reports that listed retail lamp sales by location and with program price verification reports that listed prices by retailer, store number, manufacturer, and month. EAI also provided data on both mass marketing, including radio interviews, ads at local high school sporting events, and other community events as well as in-store promotional events and displays. The Team verified all prices with EAI and the implementer to ensure they captured all discounts, both utility discounts and any additional discount provided by the manufacturer or retailer.

Combining the sales data and price verification reports was not straightforward. Each SKU had multiple model numbers, both from the retailer and manufacturer, and the SKUs often differed between the price data and the sales data. Additionally, some bulbs were tracked with multiple model numbers within the same dataset. While the implementer provided the Team with sufficient data to match the prices to the sales records, the process was laborious and often involved matching numbers from multiple files. Tracking consistent model numbers for each SKU would make tracking program progress much easier, especially if the implementer wanted to make changes, such as raising incentives for specific bulbs, to ensure the program meets its goals. Tracking consistent model numbers for each SKU would make tracking program progress much easier, especially if the implementer wanted to make changes, such as raising incentives for specific bulbs, to ensure the program meets its goals.

Analysis

The Evaluation Team modeled the data as a panel, with a cross-section of program package quantities modeled over time. Since there were price data for all lamps—with and without program incentives—the Team was able to use price, promotional activity, and sales variations within the program period as the basis for the demand modeling.

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We checked the model's representativeness using three criteria:

1. Data Adequacy – an appropriate number of sample points
2. Data Representativeness – an appropriate mix of lamp types and retailers
3. Model Accuracy – verified by mapping actual values to model-predicted values

The Team modeled product sales over time as a function of price, lamp characteristics, and retail channel. We tested a variety of specifications to ascertain the impact of price and promotional activity on the demand for lamps.

Our model specification assumed a negative binomial distribution. We chose this distribution as it exhibited the best fit of the plausible distributions (i.e., lognormal, Poisson, negative binomial, or gamma).53

With our model specification process, the Evaluation Team sought to balance parsimony with explanatory power. Just as in forecasting, this approach proved critical to obtaining realistic estimates from the observed sample. We used the following criteria in assessing model specifications:

- Model coefficient p-values (keeping values less than <0.1)
- Explanatory variable cross-correlation (minimizing where possible)
- Model Akaike's Information Criteria (AIC; minimizing between models)[54]

The Team used these diagnostics to ensure that the model: (1) included all explanatory variables; and (2) did not omit any variable or have specification biases. As secondary goals of the modeling process, the Team also sought to ensure an optimal model fit and minimize multicollinearity.

Retail channels without observable price variations accounted for only 11% of total sales and were primarily smaller chains with few products. However, other retailers with observed variations had comparable targeted demographics and available products. Given the representativeness of sampled retailers with price variations, and observed variations across such a wide variety of products, the Evaluation Team confidently applied average observed elasticities to the 11% of sales from retailers exhibiting no observed price variations.

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[53] The sales were skewed heavily due to a small number of SKUs that accounted for a disproportionate share of total sales. The negative binomial model fit the sales distribution better than other models, which tended to consistently under-predict for the high-volume SKUs.

[54] The Team used AIC to assess model fit, as the R-square statistic is undefined for nonlinear models. AIC also has the desirable property that it penalizes overly complex models, similar to the adjusted R-square.

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The Team estimated the basic equation for the model as follows (for lamp model i, in period t):

$$\ln(Q_{it}) = \beta_1 + \sum_{\theta}(\beta_\theta ln(P_{it}) * Retail\ Channel_{\theta,i})) + \sum_{\pi}(\beta_\pi ID_{\pi,i}) + \sum_{\delta}(\beta_\delta Utility_{\delta,i} * Display_{it}) + \beta_2 Mass\ Market_{it} + \varepsilon_i + \gamma_t$$

Where:

ln	=	Natural log
Q	=	Quantity of lamp packs sold during the month
P	=	Retail price in that month
ID	=	Dummy variable equaling 1 for a unique retail location and model number; 0 otherwise
Utility	=	Utility marketing the product
Display	=	Dummy variable equaling 1 if a model number within a retail location was on an end cap or off-shelf display in time t; 0 otherwise
Mass Market	=	Dummy variable equaling 1 if a model number within a retail location was being mass marketed (through radio, TV, or print) in time t; 0 otherwise
ε_i	=	Cross-sectional random-error term
γ_t	=	Time-series random-error term

Table 66 presents the model elasticity estimates, standard errors, Z-scores, and associated P-values from the model. Products at Do-It-Yourself (DIY) stores, such as Home Depot or Lowes, were slightly less responsive to price than those same products at other retailers, though the differences were not statistically significant. Due to relatively low levels of price variation for specialty bulbs and no variation for LEDs , we were unable to estimate price elasticity at the bulb type level.

Table 66. Model Elasticity Estimates

Retail Channel	Elasticity Estimate	Standard Error	P-value
DIY	-0.7304	0.2253	<.0001
Non-DIY	-0.9484	0.0324	<.0001

Both elasticity estimates are significant at the 0.10 level of significance. The elasticity estimates show how responsive lamp sales are to price. The elasticity estimate for lamps sold at DIY stores reveals that a 1% decrease in price would cause a 0.73% increase in lamp packs sold, holding the effects of other independent variables constant.

Table 67 shows the estimated model coefficients for promotional activities. These values show expected sales increases for retail displays, such as end caps, as well and for mass-market advertising. These coefficients can be interpreted as the approximate increase in percent of sales due to the presence of either special displays or mass market advertising. For instance, the presence of mass market advertising

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was associated with a 7% increase in program sales and the use of retail displays increased sales by nearly 31%.

Table 67. Sales Lift Estimates from In-Store Promotions and Mass Advertising

Retail Channel	Lift Estimate	Standard Error	P-value
Retail Displays	0.3067	0.0394	<.0001
Mass Advertising	0.0744	0.0183	<.0001

The Evaluation Team used the final model to predict lamp sales at both the target and original retail prices. Then we multiplied the number of lamps—sorted by utility and lamp type—by energy savings calculated from the program engineering review. Then the Team summed energy savings for both the program and non-program[55] scenarios and calculated freeridership using the formula below.

The basic formula for freeridership is:

$$FR\ Ratio = \frac{\sum_i^n \left(E\left[bulbs_{NOPROG_i}\right] * Gross\ kWh_i\right)}{\sum_i^n \left(E\left[bulbs_{PROG_i}\right] * Gross\ kWh_i\right)}$$

Where:

$E[bulbs_{NOPROGi}]$	=	The expected number of lamps of type '*i*' purchased given the original retail prices by the program (as predicted by setting the model price to original retail levels) and zero retail displays
$Gross\ kWh_i$	=	The gross energy savings for lamp type '*i*.'
$E[bulbs_{PROGi}]$	=	The expected number of lamps of type '*i*' purchased given prices dictated by the program (as predicted by the model)

Findings

The final program-wide estimated NTG ratio based on this analysis was 50%. To be clear, this number is better thought of as the *net-of-freeridership* ratio, because it does not include program spillover. The Team found program-wide freeridership to be within the expected values for residential upstream lighting programs. Table 68 provides net-of-freeridership ratios by lamp type.

[55] To calculate non-program savings the model estimates sales outside the price points observed in the program data since non-program sales were unavailable for this analysis. However, even with this limitation, the model results were more rigorous than self-report willingness to pay analyses or other common methods, where predictions made outside the range of observation or self-report bias can skew results. Rather, this method draws inferences from observable trends in the sales data. The Team will continue efforts to acquire non-program sales data to mitigate potential bias in extrapolating out-of-sample for future evaluations.

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Table 68. Program Net-of-Freeridership by Lamp Type

Lamp Type	Net-of-Freeridership
Standard	52%
Specialty	33%
LEDs	54%

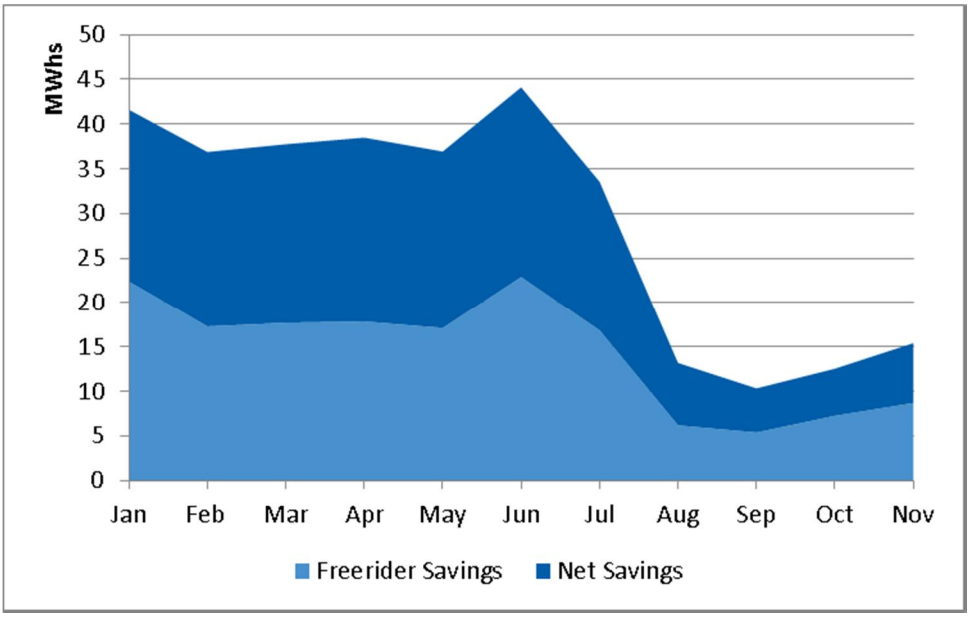
Table 69 presents net-of-freeridership estimates by retail channel. DIY stores had a higher net-of-freeridership than non-DIY stores.

Table 69. Freeridership Retail Channel

Retail Channel	Net-of-Freeridership
DIY	37%
Non-DIY	54%

Figure 27 shows net versus freerider savings over the 2013 program year.

Figure 27. Net and Freerider Savings by Month



Spillover

The Evaluation Team had planned to purchase point-of-sale data for all retail channels, including products sold outside of the program, in order to estimate spillover effects from this program. However, these data were not available for this analysis. The Team will continue with efforts to acquire this data for future evaluations.

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Benchmarking

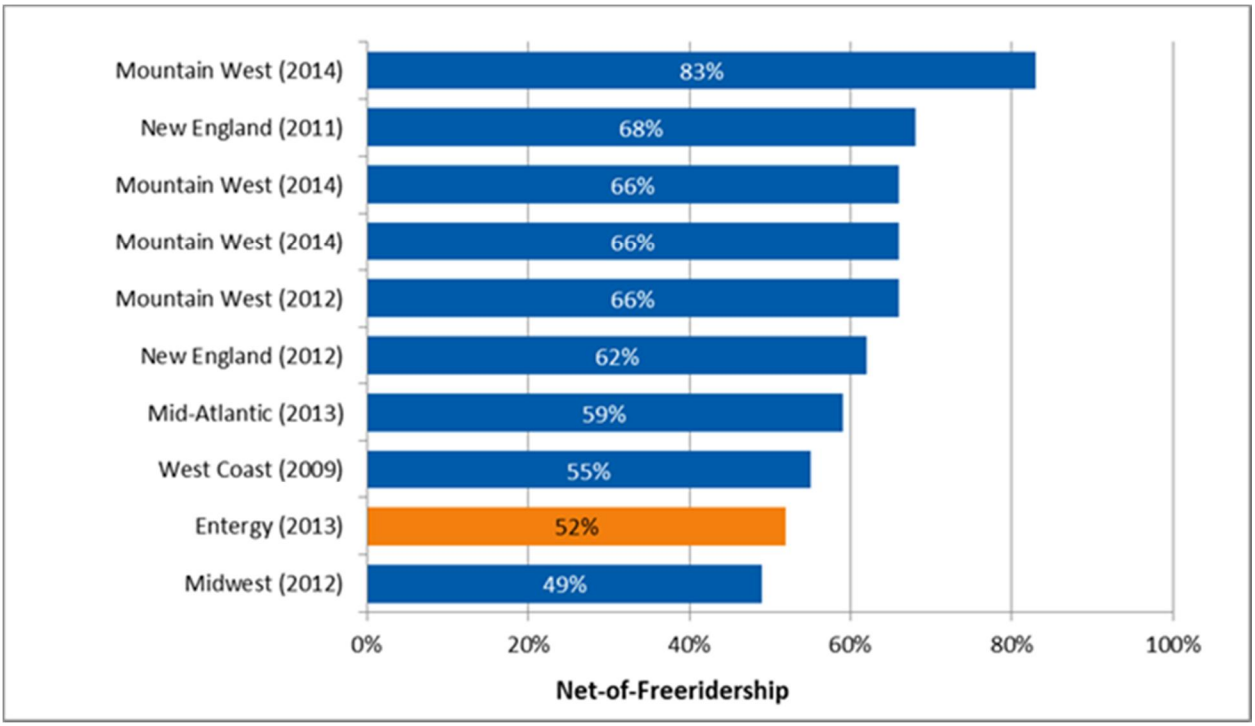
In the 2012 Lighting and Appliances Program evaluation, the Evaluation Team attempted to calculate NTG using primary data collection techniques; however, in part due to difficulties obtaining useful data from program retailers, our analysis resulted in widely ranging NTG values from 0.41 to 0.72, so the Team reverted to the APSC-stipulated value of 0.63.56 The net-of-freeridership value the Evaluation Team calculated using the price response modeling approach, at 0.50, was within the range of NTG values found based on retailer responses in 2012 (Table 70).

Table 70. Net-of-Freeridership by Program Year

Evaluation Year	Method	Net-of-Freeridership
2012	Stipulated	0.63
2013	Price Response	0.50

The Evaluation Team completed sales data-based demand elasticity modeling for evaluations in Idaho, Maine, Maryland, Michigan, Minnesota, Missouri, Wisconsin, Utah, Washington, and Wyoming. Figure 28 compares net-of-freeridership results for the *standard lamp* CFL programs we evaluated in recent years. As shown, the EAI Lighting and Appliances Program was in the lower range expected for standard lamps.

Figure 28. Standard Lamps CFL Net-of-Freeridership Benchmarking



[56] See the 2012 *Energy Efficiency Portfolio Evaluation Report*, page 81 for a detailed description of the Team's NTG analysis process.

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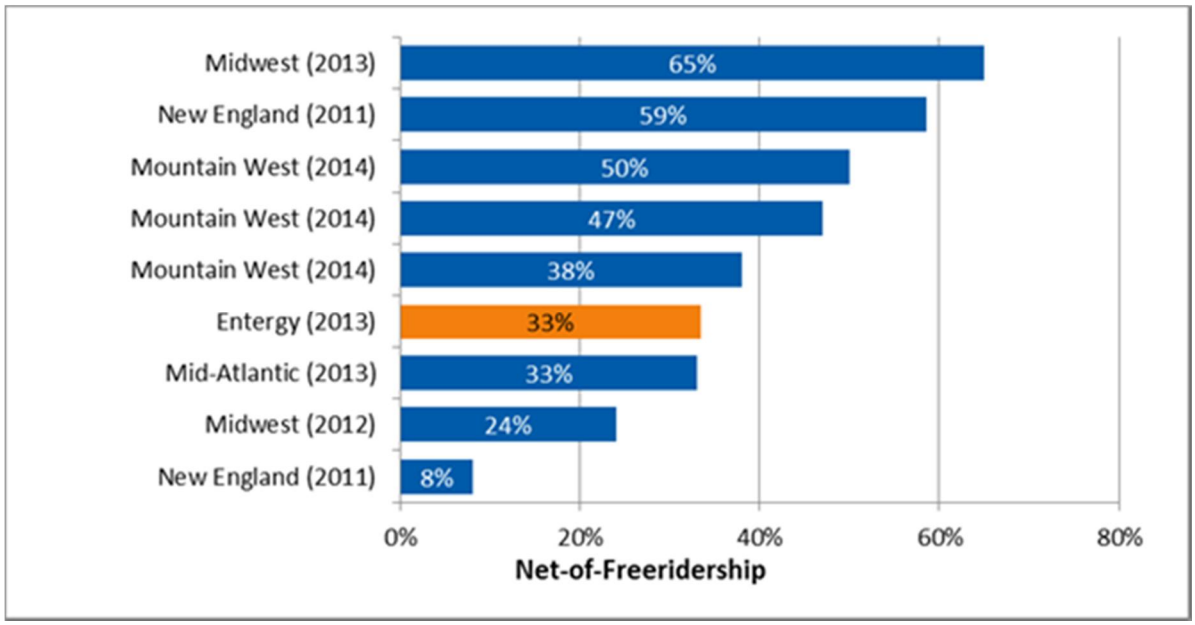
Figure 29 shows the net-of-freerider estimates for *specialty lamps* in various programs. As with standard CFLs, the net-of-freeridership for EAI's Lighting and Appliances Program was within the mid-to-lower expected range for *specialty* CFLs.

Figure 29. Specialty CFL Net-of-Freeridership Benchmarking



Confidence and Precision

Once the Evaluation Team developed the final model specification, we calculated bootstrap standard errors to determine the NTG ratios' sensitivity. To develop bootstrap standard errors, the Team created 236 new samples by resampling with replacement from the full dataset used for modeling. This method estimated coefficients for each sample and calculated a new NTG ratio for each sample. Using this method, the NTG ratios in the 5th and 95th percentiles represented the lower and upper bounds of the 90th confidence interval. As shown in Table 71, estimates were relatively efficient, with average absolute precision within 10%.

Table 71. Bootstrap Precision of Net-of-Freeridership Estimates at 90% Confidence

Net-of-Freeridership	Lower Confidence Limit (90%)	Upper Confidence Limit (90%)	Average Absolute Precision (90%)
50%	45%	55%	5%

Evaluated Net Savings

As all non-CFL measures offered through the Lighting and Appliances Program contribute a small fraction of program savings compared to CFLs, the Evaluation Team used stipulated NTG values for all measures except CFLs. We determined the NTG for CFLs through the price response model. Table 72 shows the program net savings by measure, and indicates each NTG value used. The program achieved

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29,536 MWh and 5,709 kW of net annual savings and demand reduction, respectively. These savings are estimated at the point-of-use and thus *do not include line losses*.

Table 72. Lighting and Appliances Program Evaluated Net Savings

Measure	NTG	Net MWh	Net kW
CFLs	50%	28,563	5,207
Fixtures	63%	86	16
LEDs	80%	309	56
APSs	80%	49	6
Refrigerators	80%	24	3
Window ACs	80%	504	421
Total		29,536	5,709

Residential Light Logging Study

The Evaluation Team performed a residential lighting study in 2013 that included a whole-home lighting inventory of 75 Arkansas homes and metering of up to 10 lamps in each home. The Team installed meters in May 2013 and removed them in October and November 2013.

The light logging study yielded regional data that the Evaluation Team used in place of several deemed parameter values in Arkansas TRM 3.0 savings algorithms. The subsequent sections describe our methods and results for the following savings values:

- Home Inventory Results
- In-Service Rate
- Hours-of-Use
- Interactive Effects Factor
- Coincidence Factor

Logging Study Methodology

Sampling of Households

The Evaluation Team recruited households for the study by phone from a random sample of residential customers of each utility, targeting 63 EAI households and 12 SWEPCO households.

Whole-House Inventory

Our lighting protocol required the technician to first complete a whole-home lighting inventory, using Cadmus' proprietary iPad-based Ariel data collection tool. Using the tool's electronic forms, the technician recorded the following data for each inventoried light: room type, fixture type, lamp type, lamp shape, socket type, control type, the number of lamps per fixture, and whether the light was exposed to ambient natural light.

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Moving systemically room by room,[57] the technician recorded detailed information for every identified interior and exterior fixture, noting whether the light was part of a fixture group. A fixture group is a set of fixtures on the same circuit that all turn on and off together. Typically, data collection took approximately an hour to complete, although the exact time required varied, depending on home size and the number of fixture types present.

Random Fixture Selection

After completing the lighting inventory, the technicians installed up to 10 meters on randomly selected lighting fixture groups, targeting incandescent and CFL lamps.

The Evaluation Team's selection protocols ensured random installations of meters within each room throughout the home by using a simulated dice application to select fixtures. This protocol is designed to eliminate the selection bias that might occur if technicians or participants chose fixtures for metering on some other, preferential basis. The iPad application allows the technician to select fixtures for metering by rolling a simulated dice with the same number of sides as there are fixture groups in a room. For example, if a room type has six fixtures, the technician rolls a six-sided simulated die with each side representing one of the fixtures.

Meter Installation

For this study, the Team used Onset UX 90 loggers to record on/off instances for each metered light. To install a light logger successfully, the technician adhered to all manufacturer recommendations for placement, setting, auto-calibrating, attaching, and fiber optic eye usage. Additionally, technicians applied labels to every logger specifying the installation date and launch time. After installing each light logger, the technicians photographed it.

When installing the meters, technicians took great care to minimize disturbances that could potentially invalidate the gathered data.

1. First, the technicians positioned the loggers away from any ambient light source so that only the light from the metered fixture was recorded. If exposure to ambient light proved difficult to avoid, field technicians attached a fiber optic eye to the logger, which reduces the likelihood of ambient light interacting with the logger.
2. Second, field technicians used hard plastic cable ties, adhesive strips, and magnets to secure loggers to fixtures, in an effort to ensure that their placement would be unchanged throughout the metering period.

If an installation was technically infeasible due to safety or accessibility issues, the lighting protocol required technicians to document the technical conditions fully before metering another fixture group.

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[57] Depending on the participant's preference, the technicians proceeded through the residence alone or accompanied by the resident.

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Also, if a resident objected to technicians installing meters on any specific fixture group, the technician documented the resident's reasons and respected their wishes.

Meter Removal

In October and November of 2013, the Evaluation Team contacted customers approximately two weeks before the planned meter removal period to schedule site visit dates and times. As with installation scheduling, we grouped site visits by geographic regions to maximize efficiency and time. Field technicians also recorded *in situ* observations, and photographed each logger prior to removal. The Team encountered some difficulty in removing all loggers due to home owners or tenants having moved during the study period. Of 672 loggers installed in 75 homes statewide, the Team was able to retrieve 598 loggers in 68 homes.

Quality Control

To ensure high-quality, unbiased findings, the Evaluation Team undertook a series of QC steps.

As part of the lighting logger removal process, technicians conducted a series of pre-removal meter diagnostics, including:

- Completing a logger state test (which determined if the meter was functioning properly, as well as whether ambient light affected the meter's operation);
- A visual review of the total time the logger had recorded the fixture being on;
- Verbal verification from the customer that they used the light fixture;
- Verbal verification from the customer that the logger had remained in place for the duration of the study; and
- Recording the condition of the logger and battery status.

Upon removal of metering equipment, the Team's analytical staff reviewed every raw lighting meter file prior to including it in the analysis dataset. We also examined each logger to ensure that usage data were not exposed to ambient light interference. The Team relied on a heat map analysis of each logger to ultimately determine the reliability of each logger's data.

The Evaluation Team examined and removed loggers where there was evidence of interference from ambient sunlight. As an initial screen, the Team collapsed the data from the entire metering period into hourly bins to identify loggers potentially impacted by ambient light. For example, we would flag a logger installed on an exterior light showing high usage between 7:00 a.m. and 4:00 p.m. We then analyzed the flagged loggers using heat maps to visualize usage data for every hour of the metering period, an example is shown in Figure 30. The heat map on the left represents a logger that we used in the analysis and the heat map on the right represents a logger that we did not use. The colors indicate degrees of usage: green is low (<20 minutes/hour), yellow is medium (between 20 and 40 minutes/hour) and red is high usage (more than 40 minutes/hour). Each box in the heat map represents one hour and each row represents one day (with 24 boxes across).

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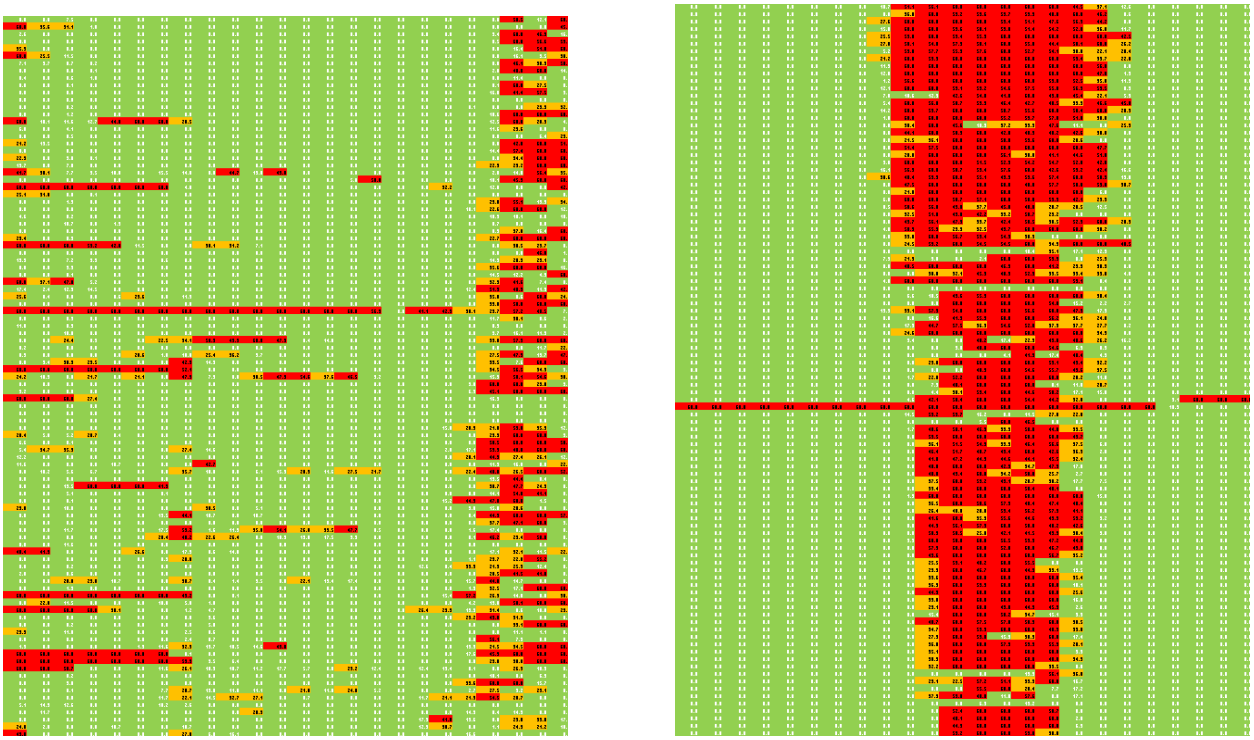
Figure 30. Left: Heat Map Used in Analysis, Right: Heat Map Discarded



The right heat map shows high light exposure during the middle of the day on an exterior light. This heat map also shows a relationship between usage hours and the length of the day: the bottom of the heat map (representing the fall) shows a narrower band of red compared to the top of the heat map (representing summer). This relationship between light exposure and daylight hours suggests that the logger was simply recording daylight and not the lamp's light output.

Summary of Key Findings

Home Inventory

As part of the light logging study, the Evaluation Team conducted lighting audits of 75 residential homes in Arkansas. As part of this effort, we recorded detailed information on housing characteristics and lighting uses, including:

- Room types (e.g., living area, kitchen, bedroom)
- Fixture types (e.g., table lamp, ceiling fixture, recessed fixture)
- Lamp type (e.g., CFL, incandescent, LED)
- Lamp shape (e.g., twister, A-lamp, globe)
- Lamp wattages
- The quantities of lamps installed and in storage

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- Specialty features (e.g., three-way functionality, dimmability)
- Socket types (e.g., medium screw-base, candelabra, pin-base)

Some of the key findings from this inventory process are:

- Of 37 installed LEDs, 45.9% were installed outside and 32.4% were installed in kitchens.
- CFLs were installed in 26.1% of all socket types.
- CFLs were most frequently installed in bedrooms (20% of sockets), bathrooms (18% of sockets), and living rooms (14% of sockets).
  - Two homes had no incandescent lamps installed. While this percentage of the population is very small (3%), several studies in other states have shown incandescent lamps present in 100% of homes. However, a recent study for a Midwest utility also found incandescent lamps present in fewer than 100% of homes.
- Fifty-nine percent of installed lamps had energy-savings potential that could be captured by installing energy-efficient lighting technologies. This potential represents the current lighting market share of circline, halide, linear fluorescent, and neon lamps, discounted by other nontechnical factors, such as appearance or customer preference that could be replaced by CFLs or LEDs.

Table 73 shows the penetration and saturation rates the Team found for lamps in the study. Penetration refers to the percentage of households that have a particular type of lamp present, regardless of quantity. Saturation represents the percentage of lamps across all sockets, across all homes with the lamp-type installed. The third and fourth columns show saturations of all lamps in all sockets types, and in medium screw-based sockets, respectively.

Nearly all homes had incandescent lamps installed (97%), and most had CFLs installed (85%). Just under half of all homes had linear fluorescent lamps installed (49%), and 5% of the population had at least one LED installed.

Table 73. Lamp Penetration and Saturation (n=75 sites)

Lamp Type	Penetration	Saturation - All Sockets	Saturation - Medium Screw-Based Sockets
CFL	85%	26.1%	33.2%
Halogen	28%	7.6%	7.7%
Incandescent	97%	54.6%	58.5%
LED	5%	1.2%	0.6%
Linear Fluorescent	49%	10.5%	-

Incandescent lamps represented more than half the lamps installed in all socket types, with an average of 23 incandescents installed per site. CFLs were installed in 26% of all socket types, for an average of 10 CFLs per site. Though LEDs were represented in 5% of homes, they only represented 1.2% of all lamps installed.

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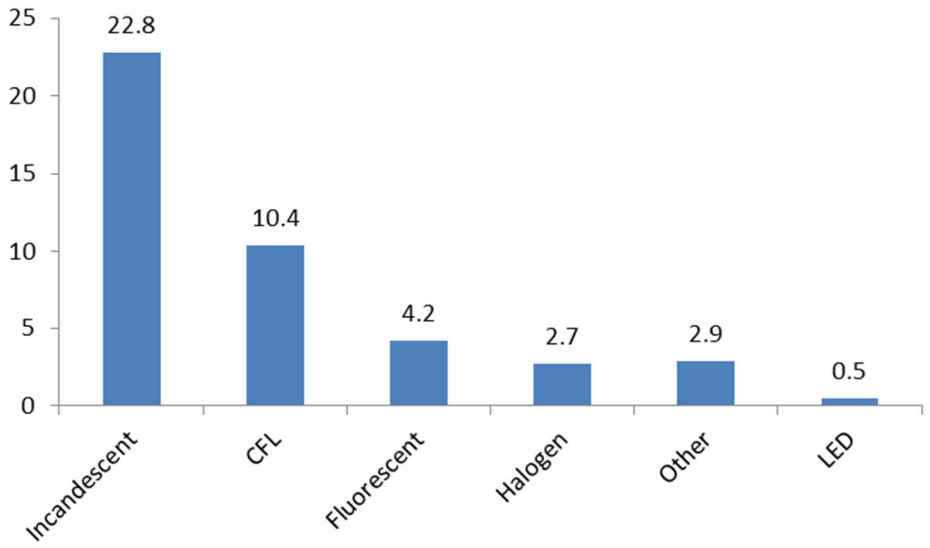
Figure 31 compares the average number of lamp types installed per home. A typical Arkansas household had 43.5 lamps of which 52% were incandescent (22.8) and 24% were CFLs (10.4).

Figure 31. Average Lamps per Home by Type



(n=75 sites and 3,263 total sockets)

During the in-home audits, the Evaluation Team gave special attention to high-use rooms such as bedrooms, bathrooms, dining rooms, family rooms, living rooms, and kitchens. As these rooms tend to have the highest rates of lighting usage, they also tend to be the first rooms where customers install efficient lighting technologies. As shown in Table 74, about one-quarter of the sockets in each high-usage room had a CFL installed. CFLs were most prevalent in dining room sockets (28.8%) and bathroom sockets (28.2%).

Table 74. CFLs in High-Use Areas (n=75 sites)

Room Type	CFL as % of Sockets per Room
Bathroom	28.2%
Bedroom	27.4%
Dining Room	28.8%
Family Room	27.1%
Kitchen	24.6%
Living Room	24.3%

As a percentage of total lamps for each room type, customers had installed incandescent lamps the most frequently, as shown by the length of the blue portion of the bars in Figure 32. Incandescents represented at least 50% of installed lamps in all rooms, except closets, garages, offices, kitchens, and laundry rooms.

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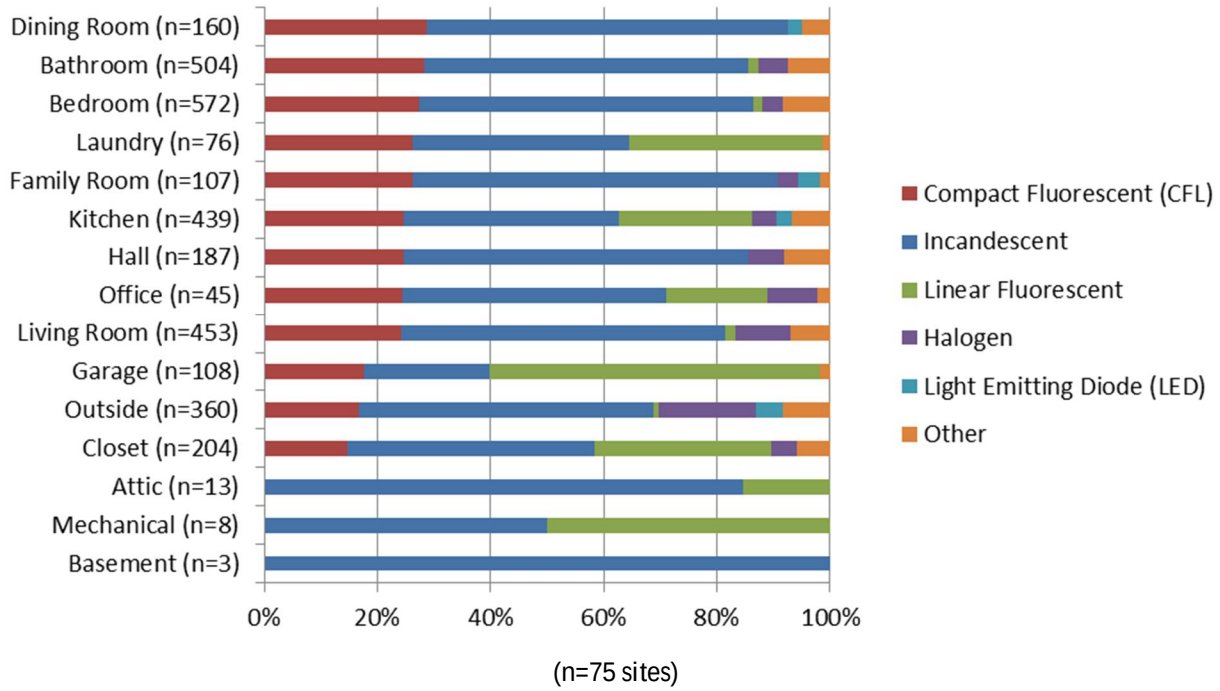
CFLs and linear fluorescents, however, also constituted a significant proportion of lamps installed in several room types.

- CFLs consistently comprised between 15% and 29% of installed lamps in rooms with at least one CFL installed. In our sample, CFLs were never installed in basements, attics, or mechanical rooms.
- Linear fluorescents were most common in garages, mechanical rooms, laundry rooms, and closets (at 58%, 50%, 34%, and 31%, respectively).

LEDs made up a small percentage of overall lamps in each location, and were most commonly found outside and in family rooms (5% and 4% of all lamps installed, respectively).

Figure 32. Lamp Type Distribution by Room Type



In-Service Rate

As part of the light logging study, the Evaluation Team collected primary data on both installed lamps and lamps kept in storage. We estimated an ISR for CFLs and LEDs based on the ratio of installed units over the total number of installed and stored lamps. This approach is consistent with the Arkansas TRM 3.0, which provides separate ISR values for the different lamp types. Lamp quantities and ISR values for CFLs and LEDs, derived from the study, are shown in Table 75.

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Table 75. Installed and Stored Lamp Quantities

Lamp Type	Number of Installed Lamps	Number of Stored Lamps	ISR
CFLs	779	62	92.6%
LEDs	37	0	100.0%

Because of the small number of LED lamps we observed, the Evaluation Team concluded that the LED sample did not support replacing the TRM ISR based on these units.[58] Thus, the Evaluation Team used the calculated first-year ISR of 92.6% for CFLs and reverted to the TRM 3.0-based value of 95% for LEDs.

Although the first-year ISR for both CFLs and LEDs is below 100%, which is common among upstream programs due to a variety of factors, studies have shown that consumers plan to install virtually all of the incented lamps they purchase through programs.[59] To account for the savings from lamps installed after the year of purchase, the Evaluation Team applied a discount rate of 7.5% to the ISR value. The first-, second-, and third-year ISR values are shown in Table 76.

Table 76. First-Year, Second-Year, and Third-Year ISR

Lamp Type	Percent of Lamps Installed First Year	Percent of Lamps Installed Second Year	Percent of Lamps Installed Third Year
CFLs	92.6%	3.2%	3.2%
LEDs	95.0%	2.0%	2.0%

Hours-of-Use

From light logger data collected, the Evaluation Team estimated an average daily HOU, which we then converted to an AOH value.

Weighting

The Evaluation Team calculated and applied lamp room weights to the lighting analysis to make the sampled lamps representative of the population of lamps in participating homes. We used the equation below to calculate individual room lamp weights, for each lamp type. We did not weight by housing type, allowing the random sample to represent the distribution of houses by multifamily, single family, and mobile homes.

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58 The TRM 3.0 ISR for LEDs, 95%, is within a simplified estimate of the 90% confidence interval of our sample, which had a lower limit of 93%. The lower limit of our CFLs estimate was 91%.

59 This result is outlined in the Unified Methods Protocol, Chapter 6: Residential Lighting Evaluation Protocol. Pages 6-17 through 6-19, which explains that ISRs below 100% can be attributed to factors such as: (1) the deeply discounted price, (2) the inclusion of program multipacks, and (3) the common practice of waiting until a lamp burns out to replace it. This chapter is available online: http://www1.eere.energy.gov/wip/pdfs/53827-6.pdf.

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$$Lamp\ room\ weight = \frac{\left(\frac{total\ inventoried\ lamps\ by\ room\ type}{total\ inventoried\ lamps\ in\ all\ room\ types}\right)}{\left(\frac{total\ metered\ lamps\ by\ room\ type}{total\ metered\ lamps\ in\ all\ room\ types}\right)}$$

Annualization

Once the Evaluation Team had verified the raw metering files' quality, we calculated the total time each logger was "on" in seconds for each hour and each day of the metering period. We then calculated the total daily HOU for each logger by summing the time it was "on" across each hour of each day. We then prepared the data for time series regression modeling by merging the summarized lighting usage records with information about the household, room type, and whether the lamp was exposed to daylight.

Since the metering period did not span the entire year, we annualized lighting results for all metered lamps in rooms subject to daylight, fitting data to a sinusoidal curve that represents the hours of available daylight per day.[60] The sinusoidal approach assumes that lighting usage for lamps exposed to daylight will decrease during the period from the winter solstice to the summer solstice as daylight increases, and will increase from the summer solstice to winter solstice as daylight decreases.

To develop an average daily HOU estimation for a light with exposure to daylight, we fit our data to the sine curve model specified below. The Team used the Yule-Walker, weighted least squares method of estimation to correct for autocorrelation in the data.

$$Hours\ of\ Use_t = \alpha + \beta_1 * Sin\left(-2\pi\left(\frac{284 + Day_t}{365}\right)\right) + \varepsilon_t$$

Where:

Hours of Use_t	=	HOU for day of year (t = 1 to 365)
α	=	Average daily HOU
β_1	=	Amplitude of sinusoid function (slope coefficient of the regression)
Day	=	Day of the year, where January 1 has a value of 1 and December 31 has a value of 365
ε_t	=	Error term of the regression

We did not use the sinusoidal annualization approach for metered lights without exposure to daylight, as available daylight is not expected to affect the usage of these lamps to a significant degree. For these lights, we assumed that the observed usage during the metering period reflected usage throughout the

[60] The sinusoidal annualization approach is recommended on page 15 of the Uniform Methods Protocol for lighting impact evaluations because of the strong relationship between daylight hours and lighting usage observed in a large number of studies (available online: http://www1.eere.energy.gov/wip/pdfs/53827-6.pdf).

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year without variation due to seasonal changes in available sunlight. Instead of applying the sinusoidal adjustment, we simply calculated the statistical mean of the observed data. The Team took the weighted average based on the number of loggers on exposed and non-exposed lamps to develop a final average daily HOU estimate.

Hours-of-Use for CFLs and Incandescent Lamps

Table 77 presents the average daily HOU for metered CFLs and incandescent lamps, as well as the overall weighted average daily HOU. The precision in this table represents variance in the annualization model associated with the intercept term. The Evaluation Team ran a separate calculation to estimate the cross-sectional variation of HOU at the logger level. The cross-sectional standard error is 0.13. The Team acknowledges that the precision estimates in Table 77 underestimate the true HOU precision.

Table 77. Average Daily Hours-of-Use, Overall and by Exposure Type

Type of Lamp	Percentage of Total Lamps	Hours-of-Use	Absolute Precision at 90% Confidence (Relative Precision)
CFLs	45%	2.17	±0.03 (±1.52%)
Incandescent Lamps	55%	1.74	±0.04 (±2.06%)
Overall Hours-of-Use	100%	1.88	±0.03 (±1.83%)

The amplitude for the average HOU estimate indicates there is an average difference of 17.4 minutes between usage at the winter and summer equinoxes, with average HOU decreasing from the winter to summer solstice. Incandescent lamps show a lower annual HOU of 1.74, with an average difference of 30 minutes of use between the winter and summer solstice. The exposed CFL lamps did not have a statistically significant relationship between daylight and HOU. Therefore, the Evaluation Team used the statistical mean of all CFL lamps to determine their average daily HOU.

Room Type

The Team analyzed HOU by room type and calculated precision at 90% confidence. Table 78 presents our results.

Kitchens had the highest HOU, at 2.95. The Team combined living rooms, dining rooms, and family rooms to represent non-sleeping common areas in a house, which had an average HOU of 2.51. Bedrooms and exterior lamps had the lowest HOU.

Table 78. Hours-of-Use by Room Type

Room Type	Hours-of-Use	Absolute Precision at 90% Confidence (Relative Precision)
Exterior	1.59	± 0.15 (±9.64%)
Living, Dining, and Family Room	2.51	± 0.07 (±2.89%)
Kitchen	2.95	± 0.10 (±3.36%)
Bedroom	1.80	± 0.05 (±2.76%)
Bathroom	2.36	± 0.03 (±1.44%)

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Interactive Effects Factor

Generally, lighting systems convert only a fraction of their electrical input into useful light output, with much of the remaining energy released directly into the space around the fixtures as heat. During the cooling season, a home's air conditioning system must remove the heat expelled by lighting, thereby increasing its energy load. During heating season, the building's heating system receives the benefit of the lighting heat byproduct. Therefore, any lighting upgrade that reduces input wattage also reduces the summer cooling load and increases a home's heating system load in winter.

The Evaluation Team quantitatively accounted for the interaction between a lighting upgrade and an HVAC system using an IEF. An IEF determines: (1) how much less of the lighting system's heat must be removed by the cooling system after installation of efficient lighting, and (2) how much more heat the heating system must produce during the winter to make up for the lower heat production of efficient lights.

We used different IEF values for energy (IEF_E) and peak demand (IEF_D) because the peak period is during the cooling season and is not affected by changes to heating load. An IEF_E of 1.1 means that, annually, for every 1 kWh saved by an efficient lighting system, an additional 0.1 kWh is saved in the HVAC systems. Similarly, an IEF_D of 1.15 means that—for a particular peak period—each reduction of 1 kW in lighting saves an additional 0.15 kW in peak cooling energy.

IEF_G represents the gas penalty for homes with gas heating systems. IEF_G is always a negative value and represents the relative amount of additional gas that must be burned in the winter to replace the reduced heat output from efficient lighting. An IEF_G of -0.02 means that for every kWh saved by efficient lighting, the heating system must burn an additional 0.02 therms of gas.

The Arkansas TRM 3.0 lists the residential IEFs shown in Table 79. These factors, from California Public Utilities Commission's Database of Energy Efficient Resources, represent California Climate Zone 14, which is similar to Arkansas in CDDs and HDDs and daily temperature profiles. This affects the length and intensity of the respective heating and cooling seasons, a major contributor of lighting interactive effects.

Table 79. Arkansas TRM 3.0 Interactive Effects Factors

Equipment	IEF_E	IEF_D	IEF_G
Gas Heating	1.14	1.53	-0.023
Heat Pump Heating	0.43	1.53	N/A
Electric Resistance Heating	0.83	1.53	N/A

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Analysis

To determine interactive effects specific to Arkansas, the Evaluation Team developed energy simulation models using BEopt™ Version 2.1.[61] We created five models to represent various heating and cooling combinations (see Table 80) and applied the weather from Little Rock[62] as the simulation location. We chose Little Rock due to its central location and large population center as a proxy for the state because weather patterns in Arkansas are relatively consistent, so weather differences across the state would not result in a great deal of variation.

The lighting IEF is dependent on many influences, but the major defining factors are:

- The length of the respective heating and cooling seasons
- Electric heating saturation
- Cooling saturation
- Electric resistance versus heat-pump electric heating
- Gas heating saturation

Heating and cooling saturation indicates the percentage of houses for which interactive effects are relevant. The different efficiencies of electric resistance heating and heat pump heating affect the impact of lighting on heating load. In general, areas with long cooling seasons and low saturations of electric heating tend to have higher IEF_E values. Table 80 shows Arkansas saturation data for different heating and cooling systems.

Table 80. Heating and Cooling Saturations

Type		Saturation %
Central Cooling[1]		85.6%
Electric Heating[1, 2]	Heat Pump	7.1%
	Electric Resistance	37.9%
Gas Heating[1]		41.5%

Sources:
[1] *American Community Survey*.2012.
[2] *Residential Energy Consumption Survey* (RECS). 2009.

To run the model, the Evaluation Team designed simulated homes according to the parameters in the Arkansas TRM 3.0 Prototype Home A3. We modified the heating and cooling setpoints on the thermostat to conform to survey data from the 2009 RECS. Table 81 lists the simulation characteristics we used.

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61 BEopt is a residential energy simulation program developed by NREL. It uses either DOE 2.2 or EnergyPlus as the simulation engine, both of which are among the most advanced simulation engines available. The Team completed these simulations using EnergyPlus.

62 Specifically, we used the Little Rock Air Force Base TMY3 weather.

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Table 81. Simulation Characteristics

Parameter	Value
Size[1]	1,850 sq. ft.
Attic Insulation[1]	R-19
Wall Insulation[1]	R-11
Window Type[1]	Double-Pane Metal
Building Leakage[1]	10 ACH50
Heating Thermostat[2]	71°F w/68°F setback
Cooling Thermostat[2]	72°F w/74°F setback
Heat Pump[1]	7.2 HSPF 10.0 SEER
Gas Furnace[1]	78 AFUE
Air Conditioner[1]	10.0 SEER
Electric Furnace[1]	1.0 COP

Sources:
[1] Arkansas TRM 3.0 Prototype Home A3
[2] 2009 RECS for Arkansas, Louisiana, and Oklahoma

Using the BEopt model, we simulated lighting usage with load-shape information from the Evaluation Team's 2013 light logging study. A load shape represents the average hourly load for each hour of the day and for each day of the year. The load shape reflects real occupant behavior for lighting usage and is important for calculating lighting interaction during peak periods.

The simulation model assumes that all lighting energy from interior fixtures dissipates into the conditioned space of the home. While this is likely true for most interior fixtures, certain fixture types (such as recessed-can lighting) extend beyond the thermal boundary of the home. We tested can lighting in the Cadmus laboratory to quantify the lighting energy that dissipates through the attic and enters the home. Our test showed that, on average, 60% of the lighting energy enters the home. By weighting socket studies with these results, the Evaluation Team determined that 2% of the lighting energy used in recessed lighting fixtures is dissipated outside. We applied this lighting energy factor to the model results.

The Evaluation Team weighted the results for the upstream lighting value using socket survey data from the 2013 light logging study to account for lamps with no HVAC interaction. The study results showed that 84% of high-efficiency lighting was installed in conditioned spaces (living room, bedroom, etc.) and 16% was installed in unconditioned spaces (exterior, garage, etc.).

For each home, we modeled two lighting scenarios: one with the baseline scenario of 34% fluorescent lighting (which consumed approximately 1,700 kWh/year) and one with 80% fluorescent lighting (which consumed 1,330 kWh/year). While the latter model did not necessarily represent the typical retrofit scenario, it allowed the Team to calculate the proportion of heating and cooling energy changes associated with reduced lighting loads, which applies to any level of incandescent-to-CFL conversion.

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The Evaluation Team used the following equation to determine the IEF_E for electrical energy.

$$\frac{\Delta\ Lighting\ kWh + \Delta Cooling\ kWh +\ \Delta Heating\ kWh}{\Delta\ Lighting\ kWh} = IEF_E$$

To determine the IEF_D for electrical demand, the Team used the following equation. We defined peak period as July and August weekdays from 3:00 p.m. to 6:00 p.m.

$$\frac{Average\ \Delta\ Lighting\ kW@\ Peak\ Period\ +\ Average\ \Delta Cooling\ kW\ @\ Peak\ Period}{Average\ \Delta\ Lighting\ kW\ @\ Peak\ Period} = IEF_D$$

The Team used this equation to determine the IEF_G for gas demand.

$$\frac{\Delta\ Heating\ Therms}{\Delta\ Lighting\ kW} = IEF_G$$

Applying all three equations to the hourly output of the simulations yields the results in Table 82.

Table 82. Interactive Effects by Equipment Type

HVAC Equipment	IEF_E	IEF_D	IEF_G
Fuel Heat w/ CAC	1.12	1.35	-0.014
Fuel Heat w/o CAC	1.00	1.00	-0.014
Heat Pump	0.96	1.35	0
Electric Resistance w/ CAC	0.80	1.35	0
Electric Resistance w/o CAC	0.68	1.00	0

Weighting the values to statewide average heating and cooling system saturations and lamp locations resulted in an IEF_E of 0.97, an IEF_D of 1.25, and an IEF_G of -0.0063 (Table 83). These results show that on average, every 1 kWh of lighting energy saved results in 0.97 kWh of total electricity being saved and an additional 0.0063 therms of gas being burned; and 1 kW of lighting demand reduction results in a total 1.25 kW of net demand reduction.

Table 83. Weighted IEF Results

HVAC Equipment	IEF_E	IEF_D	IEF_G	Weight
Fuel Heat w/ CAC	1.10	1.29	-0.011	47.1%
Fuel Heat w/o CAC	1.00	1.00	-0.011	7.9%
Heat Pump	0.96	1.29	0	7.1%
Electric Resistance w/ CAC	0.83	1.29	0	31.4%
Electric Resistance w/o CAC	0.73	1.00	0	6.5%
Weighted Average	0.97	1.25	-0.0063	

Findings

The Evaluation Team applied the weighted average IEF_E and IEF_D to calculate energy and demand savings for EAI's upstream lighting program, as well as savings for other residential programs installing

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CFLs. Table 84 lists WHF sources across several regions. The only values that show a net positive interaction ignore any heating penalty. The sources that include a heating penalty have a lower average IEF_E (of 0.90) than the weighted average of 0.97 for Arkansas. This is reasonable since Arkansas' climate is significantly warmer that the first three locations in the table.

Table 84. Comparisons to Other Sources

	Sources of WHF	Heating Adjustment	Cooling Adjustment	WHFe	Includes Heating Equipment Interaction
Includes Heating Penalty	Regional Technical Forum (OR, WA, ID, MT)	-22%	7%	0.86	Yes
	New York TRM (TecMarket Works 2010)	-12%	3%	0.91	Yes
	Wisconsin	-10%	8%	0.94	Yes
	Mean including heating penalty	-15%	6%	0.90	
No Heating Penalty	Vermont TRM (VEIC 2012)	N/A	6%	1.06	No
	Ohio TRM (DPS 2010)	N/A	7%	1.07	No
	Mid-Atlantic TRM 2012 (VEIC 2011)	N/A	14%	1.14	No
	State of Illinois Energy Efficiency TRM 2012 (Illinois 2012)	N/A	6%	1.06	No
	Multifamily section of Illinois TRM (Illinois 2012)	N/A	4%	1.04	No
	Mean excluding heating adjustment		7%	1.07	

Coincidence Factor

The Evaluation Team estimated a peak CF for CFLs based on usage data collected for the HOU study. TRM 3.0 assumes a peak CF of 9% based on non-holiday *summer* weekdays from 3:00 p.m. to 7:00 p.m. The TRM is not completely clear regarding which specific months are identified as "summer," so the Team estimated the peak CF for the following periods:

- June 1 through August 31 non-holiday weekdays from 3:00 p.m. to 7:00 p.m.
- June 1 through September 30 non-holiday weekdays from 3:00 p.m. to 7:00 p.m.

Using light logger data collected from May 2013 to October 2013, the Team calculated the total time each light was "on" for each hour during the peak period. Then, the Team calculated the average time each light was "on" per hour for each peak hour. Finally, the Team estimated a weighted average across all loggers and peak hours to arrive at the mean weighted 10% peak CF for CFLs.

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The Team found no difference in peak CF between the above peak period definitions. The Team estimated a mean weighted peak of 10% for both peak periods and used this value as a replacement for the 9% used in the TRM 3.0 savings algorithm. Table 85 provides the mean peak coincident factor values and 90% confidence intervals.

Table 85. Mean Peak Coincident Factors

Months	Time	Weekdays	Dates Excluded	Mean Weighted Peak CF	90% CI	Standard Error
June - September	3:00 p.m. to hour ending 7:00 p.m.	Monday - Friday	Independence Day (July 4, 2013) and Labor Day (September 2, 2013)	0.098	0.075 to 0.120	0.0134
June - August	3:00 p.m. to hour ending 7:00 p.m.	Monday - Friday	Independence Day (July 4, 2013)	0.099	0.075 to 0.122	0.0138

CFL Leakage Study

In the fourth quarter of 2013, the Evaluation Team implemented a multimode survey of Arkansas residents to measure certain aspects of their lighting purchasing behaviors, including the number of high-efficiency lamps currently in their home, their recent purchases, and the distance they travel to purchase lamps. These details informed our analysis of CFL leakage outside EAI's territory. The Team provided paper surveys and an online link to a random sample of 3,000 Arkansas residents, representing multiple utilities. We received 532 responses to the survey. The following section describes the results of this study.

High-Efficiency Lighting Penetration

The survey asked respondents the number of high-efficiency lamps currently in their home. Figure 33 shows that over 85% of respondents indicated that they have at least one CFL installed in their home, regardless of utility territory. This is exactly the same percentage the Team captured during our in-home lighting inventories conducted during the light logging study. Between 40% and 48% of respondents, depending on the utility, reported having LEDs installed.

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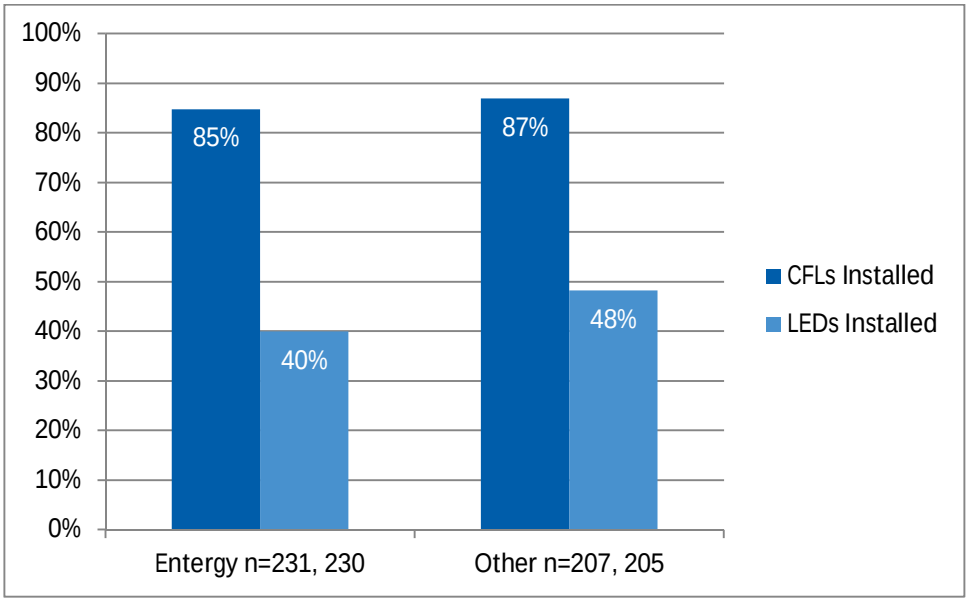
Figure 33. Percentages of Homes with at Least One CFL or LED



Q2. How many LEDs do you currently have installed in your home (n=529)
Q3. How many CFLs do you currently have installed in your home (n=532)

Figure 34 shows the distribution of the number of CFLs installed in homes in Arkansas. Twenty percent of households reported having 16 or more CFLs installed, while 28% reported having three or fewer CFLs installed.

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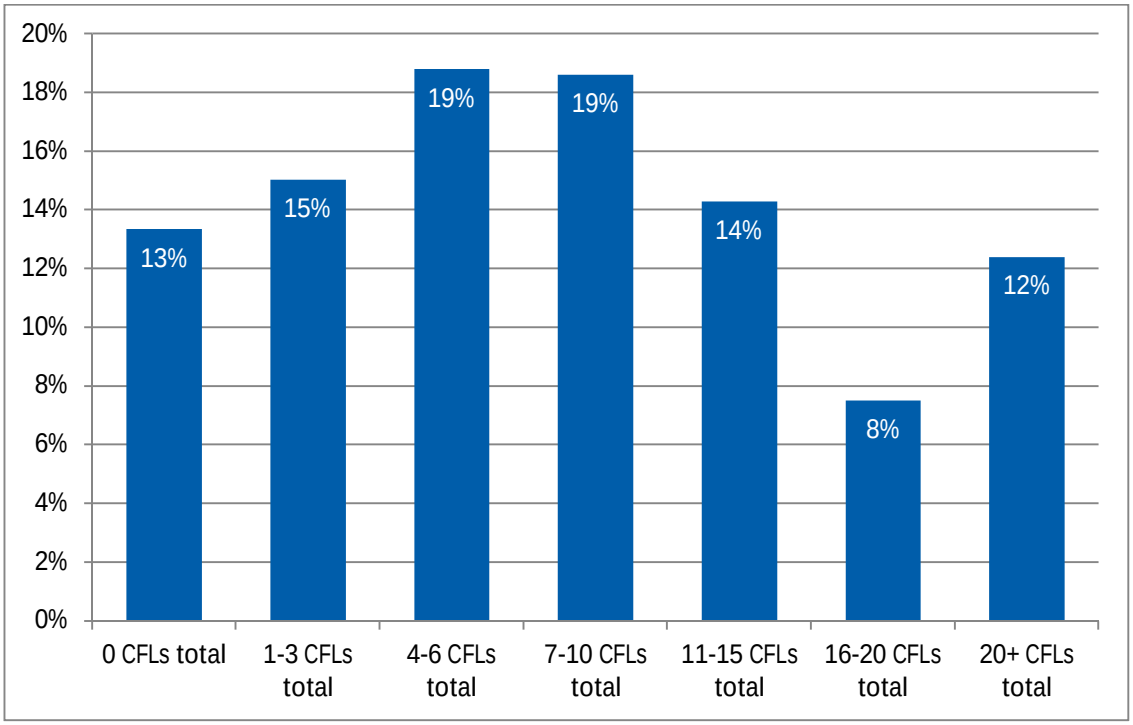
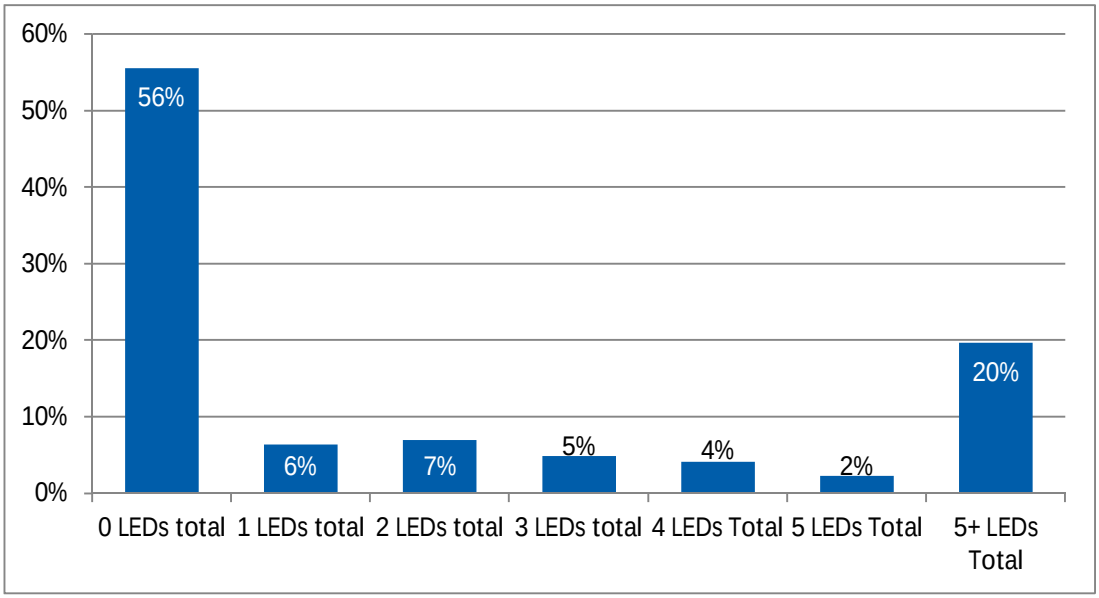
Figure 34. Percentages of Homes with CFLs Installed



Q3. How many CFLs do you currently have installed in your home (n=529)

Figure 35 shows the distribution of the number of LEDs installed in homes in Arkansas. More than half of all homes have no LEDs installed.

Figure 35. Percentages of Homes with LEDs Installed



Q2. How many LEDs do you currently have installed in your home (n=529)

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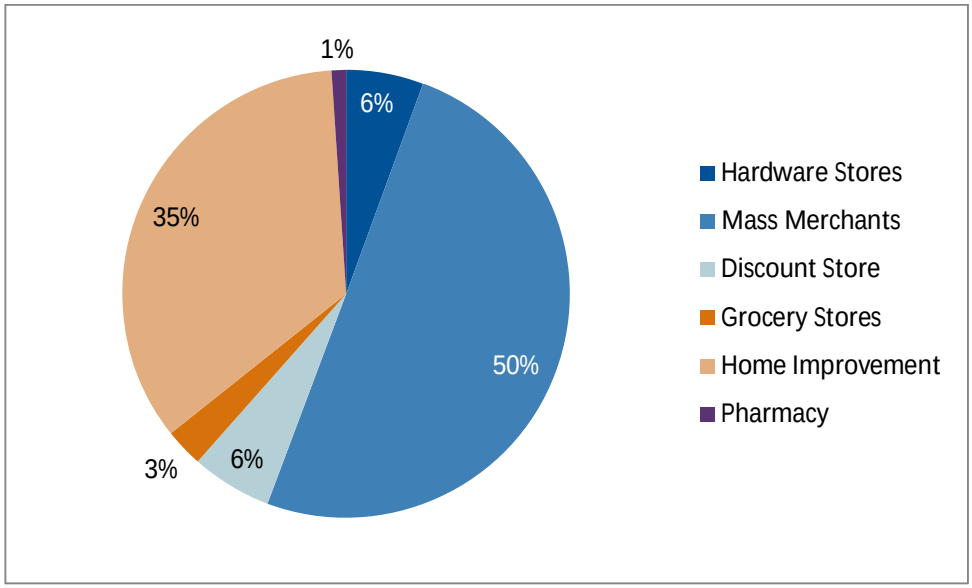
Purchasing Behavior

The majority of survey respondents reported that they purchase lighting products from mass merchandising stores (such as Wal-Mart and Sam's Club). Figure 36 shows the percentage of store types that individual respondents cited for purchasing of CFLs. Customers cited home improvement stores (such as Home Depot or Lowe's) the second-most frequently.

Figure 36. Distribution of Store Types Mentioned by Survey Respondents



Q7. Please indicate all of the stores where you purchased CFLs in the last twelve months and any additional information you can recall about those purchases (n=395; multiple responses allowed)

Figure 37 conveys the importance of discounts in customers' decisions to purchase CFLs. Customers that were in neither the EAI or SWEPCO territory placed the greatest importance on discounts in their decision to purchase CFLs.

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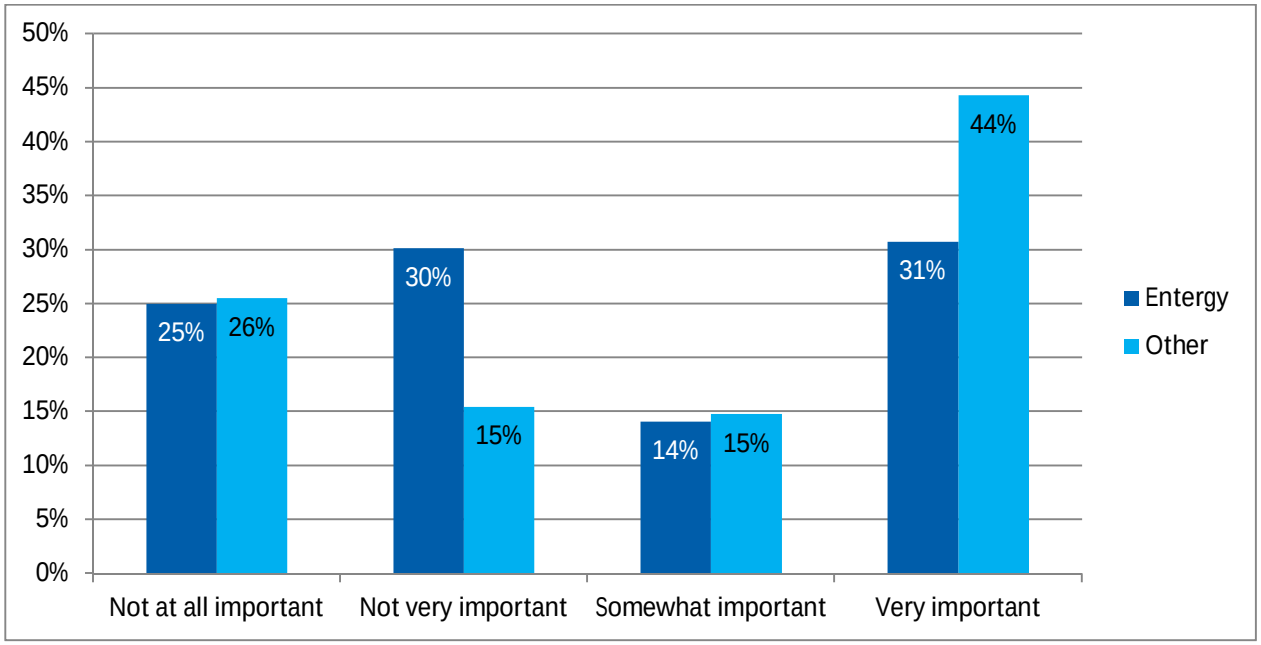
Figure 37. Importance of Discount in Decision to Make Purchase



Q7e. How important was the discount in your decision to make the purchase? (n=343)

Drive Time

The Evaluation Team used the surveys primarily to gather data on the length of time customers drive to buy high-efficiency lamps. We asked respondents to "please enter the names of the stores where you purchased CFLs in the last 12 months and how long [it takes] for you to drive to those stores." We used this data to inform our analysis of CFL leakage.

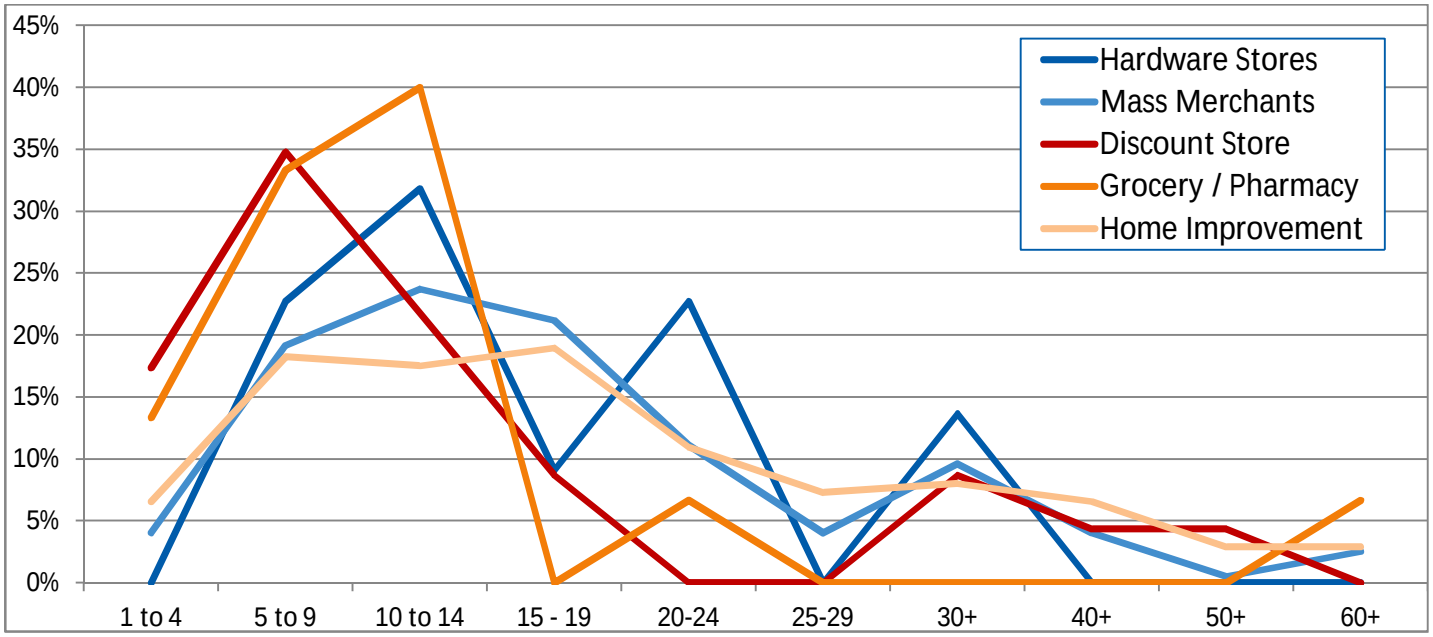
Table 86 breaks down customer responses regarding drive time by story category. Moreover, the table is split in two at the 15 minute mark as an arbitrary assumption of locality. The data shows that smaller stores (hardware, discount, pharmacy, and grocery) attract consumers who live closer to them, while mass merchant and home improvement stores draw customers from a greater distance. The latter class of stores sells significantly more lamps overall than the smaller stores. Figure 38 visually represents Table 86.

Table 86. Drive Time in Minutes by Store Type*

Store Type	Drive Time (minutes)										N
	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	40+	50+	60+	
Hardware Stores	0%	23%	32%	9%	23%	0%	14%	0%	0%	0%	22
Mass Merchants	4%	19%	24%	21%	11%	4%	10%	4%	1%	3%	198
Discount Store	17%	35%	22%	9%	0%	0%	9%	4%	4%	0%	23
Grocery/Pharmacy	13%	33%	40%	0%	7%	0%	0%	0%	0%	7%	15
Home Improvement	7%	18%	18%	19%	11%	7%	8%	7%	3%	3%	137
Total Response	6%	21%	23%	18%	11%	5%	9%	5%	2%	3%	395

* Table may not sum due to rounding.

Figure 38. Distribution of Respondents' Drive Time to Store Type



Q7b. Approximately how long does it take you to drive to that store (in minutes)? (n=395)

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GIS Mapping

The Evaluation Team used sales data and a GIS to estimate the percentage of EAI-discounted CFLs distributed, or "leaked," to non-utility customers. This analysis, which is a refinement of previous attempts to estimate CFL leakage, involved four steps:

1. Spatially overlay utility service areas and population data from the U.S. Census Bureau.
2. Estimate the customer base for each retail store by calculating store territory based on drive time to the nearest store.
3. Allocate CFL subsidies for each store to the population within the store territory, using actual sales data and survey results about consumer drive times to retailers.
4. Calculate leakage by summarizing the subsidies received by the population in, and out of, the utility service areas, for each store territory.

The Team used four input datasets in the analysis. We conducted a QA review of each dataset prior to the analysis.

Utility Service Areas

The Evaluation Team used a GIS-compatible *shapefile* showing the service areas of electrical utilities in Arkansas from the Arkansas GeoStor[63] to map leakage. The territories within the "Electric Utility Service Territories (Polygon)" layer show that the entire state is covered by at least one polygon representing an electrical utility. The Team used an "Electric IOU Service Territories" dataset purchased from Platts/McGraw-Hill[64] to verify the publicly available service area *shapefile*. We made several changes to the final territory map to resolve discrepancies between the map files.

Figure 39 shows the final service areas, after the following changes were made:

- Some portions of Western Arkansas were covered by two overlapping utility service area features in the GIS layer. All of the overlap could be attributed to a boundary representing the Arkansas Valley Electric Cooperative (AVEC). Based on the Platts layer, we discarded areas where AVEC's service area overlapped neighboring service areas.
- We reclassified the service areas for Hot Springs, AR and Pine Bluff, AR as being served by EAI.
- We reclassified an unassigned polygon between Hector, AR and Smyrna, AR as being served by EAI.

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63 Source: http://www.geostor.arkansas.gov/G6/Home.html.

64 Source: http://www.platts.com/IM.Platts.Content/ProductsServices/Products/gismetadata/iou_terr.pdf.

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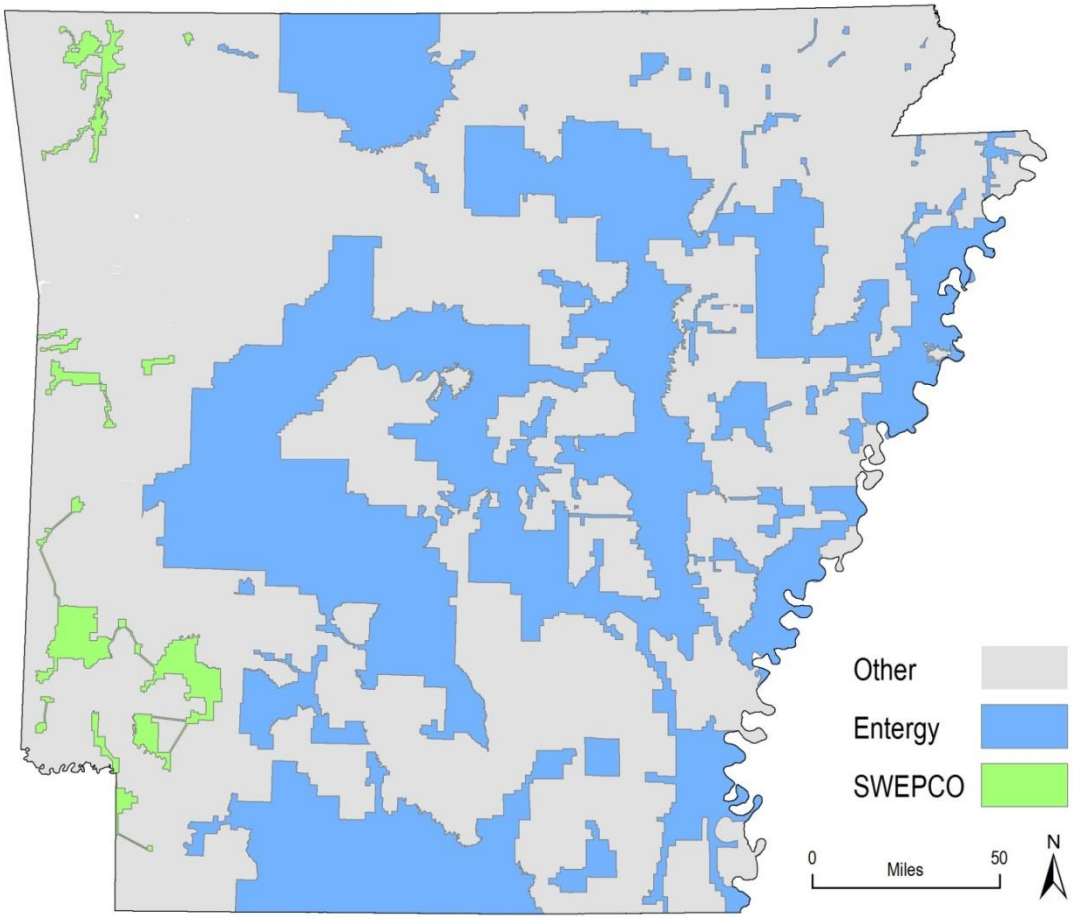
Figure 39. Arkansas Utility Service Areas



Population

The Evaluation Team chose to use population data from the 2010 Decennial Census conducted by the United States Census Bureau, reported at the block level.[65] The Decennial Census is the highest-accuracy source of population data, and blocks provide the highest publically available spatial resolution. For this analysis, the Evaluation Team converted polygonal Census blocks to points based on the coordinates of the block's centroid. The Census block points are shown in Figure 40, colored by the underlying utility service area. Arkansas contains 186,246 Census blocks.

[65] Source: *2010 Census Population and Housing Unit Counts – Blocks*. Available online: http://www.census.gov/geo/maps-data/data/tiger-data.html.

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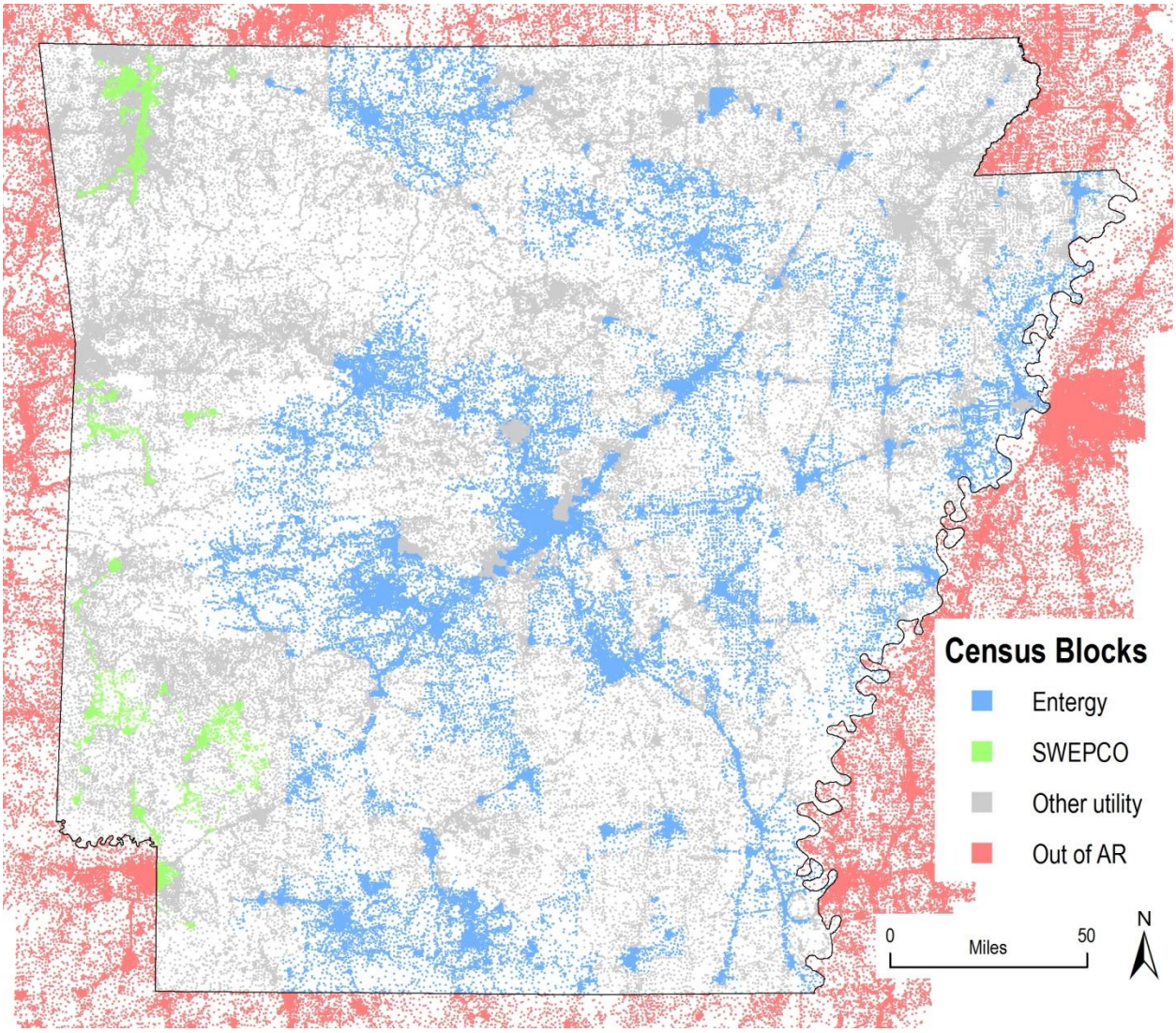
Figure 40. Census Block Points by Utility Service Area



Store Locations and CFL Subsidies

EAI provided data showing that they sold a total of 1,361,125 subsidized CFLs at 166 retailers.

The retailers that sold subsidized lamps represented many market categories, including home improvement stores, discount stores, grocery stores, and others. Our analysis assumed customers purchased CFLs from only one retailer within a market category (i.e., they drove and shopped at the closest store), but in reality they could visit one store from each category. Thus, the territories for retailers within the same category (e.g., home improvement stores) do not overlap, but territories for retailers in different categories (i.e., a grocery and a home improvement store) may overlap. Table 87 shows the market categories we used for this analysis, along with the specific retail chains, number of stores, and subsidizing utility.

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Table 87. Participating Stores and Subsidies, by Category

Store Category	Store	Number of Stores	Subsidies
Batteries	Batteries Plus	1	890
Big-Box	Sam's Club	2	78,172
	Wal-Mart	54	822,504
Discount	Big Lots	7	5,546
	Dollar Tree	17	67,956
Grocery	Kroger	28	20,820
Home Improvement	Home Depot	9	228,272
	Lowe's	9	134,706
Pharmacy	Walgreens	39	2,259
	Grand Total	166	1,361,126

Although EAI subsidized CFLs at 166 retail outlets, there are many similar retail locations in Arkansas within each category that did not participate in a rebate program. We accounted for these non-participating store territories to avoid overestimating the extent of participating store territories. The Evaluation Team purchased data from InfoUSA[66] detailing the names and addresses of chain stores within each category in Arkansas and bordering counties in Oklahoma, Texas, Louisiana, Mississippi, Tennessee, and Missouri. We only used data for stores whose addresses had been individually confirmed by InfoUSA via telephone, then the Team conducted a QA review to remove duplicate stores and non-retail locations (e.g. distribution centers). Next, we integrated the dataset with EAI's CFL subsidy data based on store address. Table 88 summarizes the stores in Arkansas and bordering counties of other states that we included in the territory delineation analysis.

Table 88. Total Number of Stores in Arkansas and Counties of Neighboring States, by Category

Store Category	Store	Number of Stores
Batteries	Batteries Plus	8
Big-Box	Sam's Club	16
	Wal-Mart	144
Discount	Big Lots	27
	Family Dollar Store	262
Grocery	Kroger	86
Home Improvement	Home Depot	28
	Lowe's	41
Pharmacy	Walgreens	179
Grand Total		791

The Evaluation Team performed Geocoding—the process of converting a street address to a latitude/longitude coordinate point—in two passes using separate geocoders. We conducted the first

[66] http://www.infousa.com.

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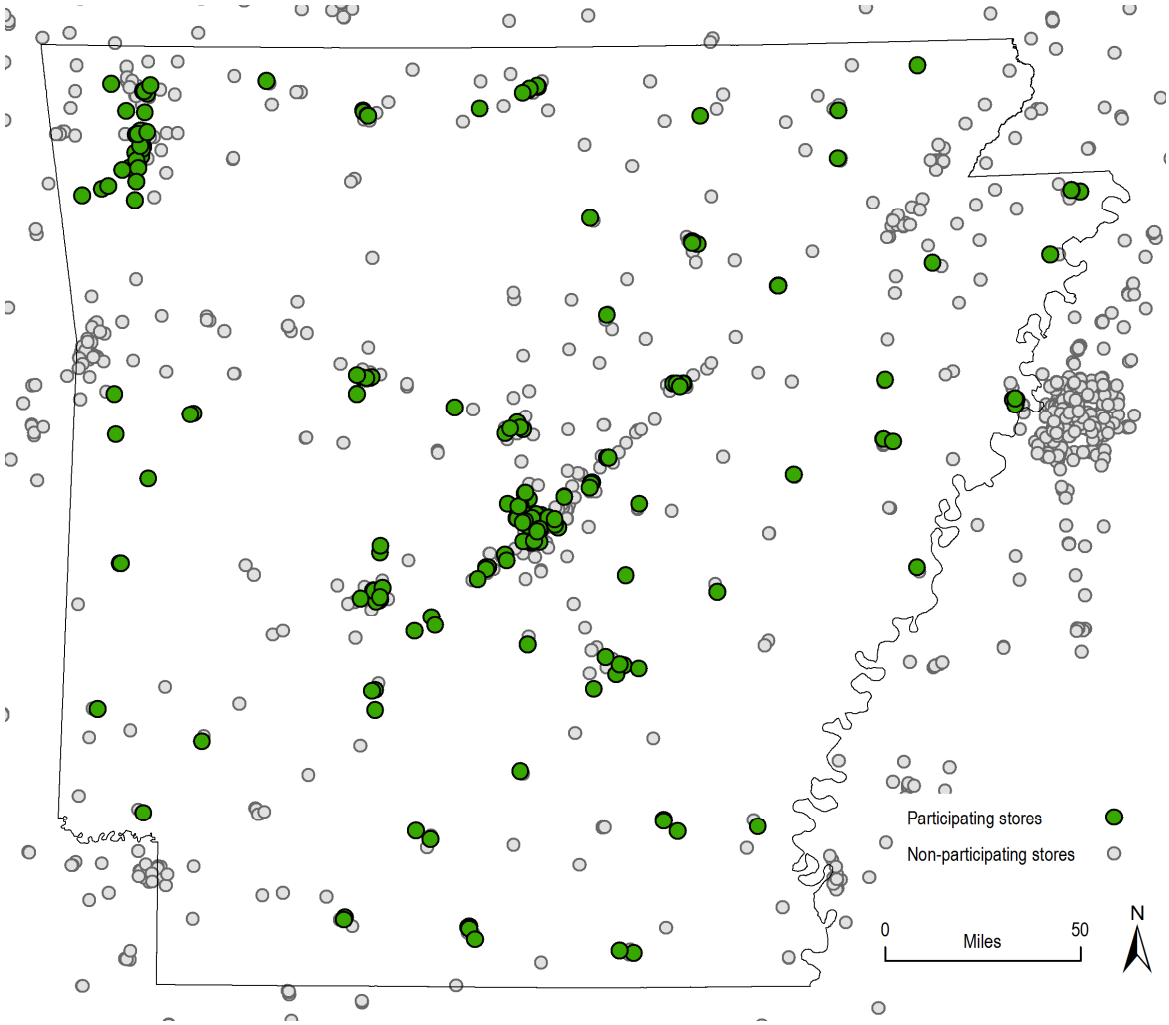
pass using the ESRI StreetMap North America road data, and used Google geocoder for the second pass. To ensure accuracy, the Team individually reviewed cases where the two geocoder passes resulted in differences of more than 500 meters. The final store locations used in the analysis are shown in Figure 41.

Figure 41. Geocoded Store Locations



Roads

Calculating drive-time required the Team to use a specialized road network dataset that contains roads, the speed limit along those roads, indicators for one-way roads, locations of turn restrictions (e.g., no left turn intersections), the grade (slope) of roads, and other ancillary attributes that impact drive time.

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The Evaluation Team used the ESRI StreetMap North America road dataset,[67] which includes these attributes, to calculate drive times to each retail outlet.

Consumer Survey Data

For our analysis, the Team allocated a fraction of each store's CFL subsidies to each of the drive time zones that surround it, representing the distribution of lamps within its territory. To capture the variability in how long consumers drive to retailers with maximum realism, the Team used empirical data from the consumer survey.

Drive Time Distribution Best Fit

For each store type, the Evaluation Team allocated customers based on drive time to purchase CFLs, as represented in Figure 42, by fitting the cumulative distribution from the survey data to a polynomial function. This approach smoothed out peaks and troughs in the distribution that were likely a product of random survey error. For instance, our survey data suggested that no one in Arkansas travels between 15 and 19 minutes to reach a grocery store or pharmacy, though some respondents said they travel 10 to 14 minutes and other respondents said they travel 20 to 24 minutes. This seems unlikely. More likely, a combination of response error and random selection error arising from a small sample (n=15) resulted in no respondents mentioning the 15 to 19 minute time category. Thus, rather than applying the distribution of drive times exactly, we applied the smoothed distribution.

Figure 42 shows a comparison of the raw and smoothed distribution of drive times to grocery stores and pharmacies. We fit the trend line to a log-transformed cumulative distribution. The best-fit, second-order polynomial equation and R^2 are included in the figure.

[67] http://resources.arcgis.com/en/help/main/10.1/index.html#//001z00000039000000.

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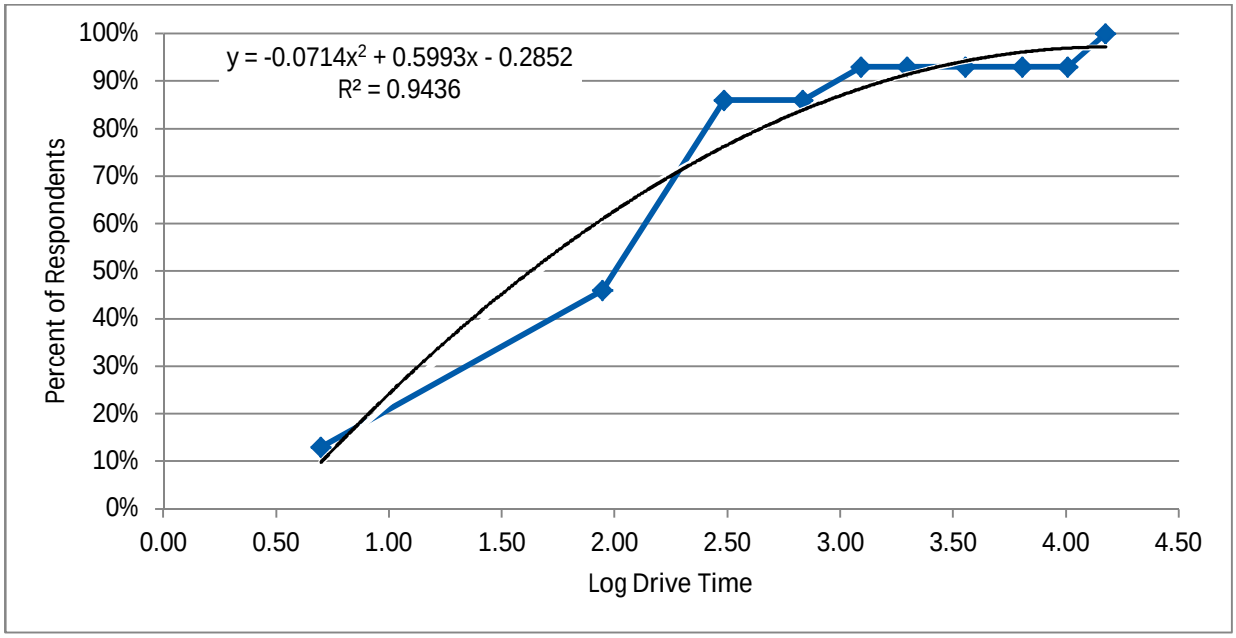
Figure 42. Raw and Smoothed Distribution of Drive Times to Grocery/Pharmacy Stores



Leakage Analysis

To quantify subsidized CFL sales outside EAI's territory, we followed the steps below.

1. Spatially join utility service areas to population

The Evaluation Team spatially joined the utility service areas to the population points using the INTERSECT match option parameter. This process attaches a utility service area's name to all the population points within the service area.

2. Delineation of store territories

The Team delineated store territories from geocoded store locations using the road data. We calculated each market category separately, allowing for overlapping territories across market categories, but not within a market category. The output store territories are comprised of concentric zones representing increasing amounts of travel time to the store. We used the travel time intervals of 5, 10, 15, 20, 25, 30, 40, 50, and 60 minutes. The Team generated store territories using the generalized (hierarchical) methodology within the Network Analyst extension to ArcGIS. Adjacent store territories do not overlap; they meet along an edge where the travel time is approximately equal to the two stores. An example set of drive time polygons (showing store territories for the home improvement category) is shown in Figure 43.

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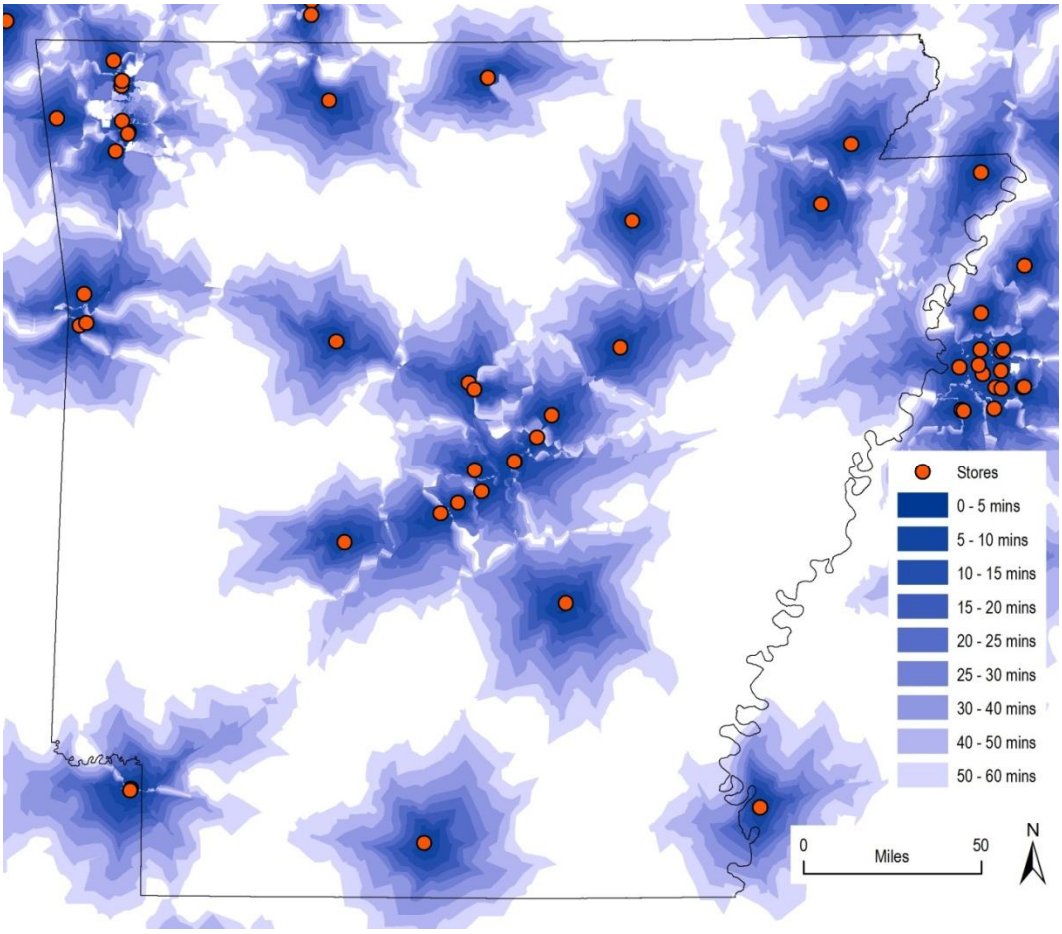
Figure 43. Store Territories with Drive Time from Geocoded Home Improvement Stores



3. Spatially join drive time polygons to population

The Evaluation Team spatially joined drive time polygons to the population points using the INTERSECT match option parameter. This process assigns the appropriate drive time zone (5 to 10 minutes, 25 to 30 minutes, etc.) to the closest store (by travel time, not by straight-line distance), in addition to the utility service area that was assigned in Analysis Step 1.

4. Summarize population and calculate output

The Team summarized population points by store ID, utility service area (EAI, in AR/out of territory, out of AR), and drive time zone (5 to 10 minutes, 25 to 30 minutes, etc.). We allocated a fraction of subsidies from each store to each drive time zone, based on the consumer survey. Table 89 shows the results, where each row contains the total population within each unique combination of store, utility service area, and drive time zone.

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Table 89. Subsidy Allocation by Drive Time Zone

Drive Time (minutes)	Store Category					
	Batteries	Big-Box	Discount	Grocery	Home Improvement	Pharmacy
0 to 5	0.00%	3.97%	16.72%	10.12%	6.71%	10.12%
5 to 10	29.51%	19.82%	39.12%	52.68%	16.94%	52.68%
10 to 15	19.54%	25.52%	13.70%	15.68%	21.89%	15.68%
15 to 20	14.81%	17.06%	7.83%	7.87%	15.24%	7.87%
20 to 25	12.06%	11.60%	5.28%	4.68%	10.86%	4.68%
25 to 30	10.25%	8.02%	3.88%	3.02%	7.95%	3.02%
30 to 40	13.84%	8.00%	4.51%	2.94%	8.75%	2.94%
40 to 50	0.00%	4.77%	3.94%	1.90%	6.55%	1.90%
50 to 60	0.00%	1.23%	2.85%	0.85%	3.53%	0.85%
60+	0.00%	0.00%	2.17%	0.26%	1.58%	0.26%

Since the Evaluation Team subdivided each drive time zone of each store based on the population inside and outside the utility's service area, we also needed to subdivide these allocations. We weighted this subdivision by population, such that the fraction of subsidies assigned inside and outside the utility service area of that store's drive time zone is proportional to the population inside and outside the utility service area of that store's drive time zone.

The final result contained population-weighted distribution of CFL subsidies by store, drive time zone, utility service area flag, and store category.

Results

Leakage estimates for EAI are shown in Table 90. Overall, the Evaluation Team estimated that 392,211 CFL subsidies were leaked to consumers outside of EAI's service area. EAI's overall leakage rate was 28.8%.

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Table 90. Leakage Estimates by Store

Store Category	Store	Entergy	
		Leaked	%
Batteries	Batteries Plus	255	28.6%
Big-Box	Sam's Club	1,356	1.7%
	Wal-Mart	273,390	33.2%
Discount	Big Lots	973	17.5%
	Family Dollar Store	15,600	23.0%
Grocery	Kroger	1,787	8.6%
Home Improvement	Home Depot	50,213	22.0%
	Lowe's	48,220	35.8%
Pharmacy	Walgreens	416	18.4%
Grand Total		392,211	28.8%

A number of factors affected the leakage value. The retailers EAI chose to provide CFL subsidies, and their respective proximity to EAI's service area boundary, is one factor. Another factor is the shape of the utility service areas: as was shown in Figure 39, EAI's service areas are larger and less fragmented than SWEPCO's, and as a result the estimated leakage rate was lower for EAI than for SWEPCO.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by the relevant evaluation findings that support the concluding statement

The Lighting and Appliances Program remained heavily dependent on CFLs.

Per the Evaluation Team's 2012 recommendations, CLEAResult focused on increasing program savings from non-CFL measures, setting soft targets for the other measures (see Table 91) and implementing strategies to support these goals, including:

- Adding one new retailer partner for window air conditioners, for a total of two, and adding three new retailers for refrigerators, for a total of four offering the measure.
- Simplifying the refrigerator requirements to make it easier for retailers to offer the measure and easier for customers to qualify for the rebate.
- Introducing LEDs to the program.
- Increasing outreach and marketing efforts to promote the non-CFL measures (see the Marketing and Outreach section for more details).

Despite these efforts, the majority of program savings came from CFLs, which made up 97% of the total. Non-lighting measure savings did not meet CLEAResult's measure-based savings targets.

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Table 91. Residential Lighting and Appliances Program Measure Category Targets

Measure Category	Targeted % of Total Savings*	Evaluated % of Total Savings
CFLs	90%	96.7%
LEDs	2%-3%	1.0%
Refrigerators	1%	0.1%
Window Air Conditioners	3%-4 %	1.7%
Compact Fluorescent Fixtures	0.25%	0.3%
APSs	0.1%	0.2%

* These targeted percentages are per the 2012 recommendations tracker: the total values do not equal 100%.

The following factors may have made it more challenging to achieve increased savings from non-CFL measures in 2013.

- Program staff removed ceiling fans from the program due to limited retailer participation (only one retailer carried qualified models and the units were only available at limited locations).
- Retailers carried very few compact fluorescent fixture models that met the TRM cost-effectiveness requirements.
- Program staff delayed offering refrigerator rebates until after discontinuing the program haul-away/recycling requirement in the third quarter.
- The program did not add cost-effective LEDs until June, and they were only available at five locations.
- Program staff decided not to offer heat pump water heaters in 2013 because only one model met the TRM requirement for cost-effectiveness, and only when the manufacturer offered a special, short-term promotion.
- Program staff did not offer APSs under TRM Version 2.0, as they were not cost-effective and TRM Version 3.0 was introduced too late in the year for retailers to incorporate APSs in 2013.
- Some retailers did not have the necessary administrative processes in place to offer program discounts on window air conditioners.

Leakage decreased as a result of EAI's mitigation efforts, but continued to be an issue.

As cited in the 2012 *Energy-Efficiency Portfolio Evaluation Report,* program staff reported that leakage negatively impacting the program. In 2013, the Evaluation Team conducted a detailed study to quantify leakage and determined that approximately 28.8% of program bulbs were purchased by non-EAI customers and installed outside EAI's territory.

Starting in August of 2013, to address the leakage issue, staff began to discontinue the CFL measure in stores with high leakage potential, and had stopped offering program bulbs at 66 stores[68] by the end of October. In addition, program staff introduced a system to verify customers at outreach events to

[68] This represents approximately 35% of the retailers providing CFL subsidies in Arkansas.

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reduce potential leakage from CFL giveaways. These efforts may have had some effect on the leakage rate in Arkansas' territory, as the rate dropped from 32.6% in 2012, a reduction of 3.8%.

Program Design

Removing the refrigerator recycling requirement simplified the program.

After determining it was too cumbersome for retailers and customers to ensure that old refrigerators were being recycled, program staff simplified the refrigerator requirements so that:

- Retailers and customers were no longer required to show that the old units were delivered to a certified recycling program.
- Program staff and retailers were no longer required to train retail associates on the recycling requirements.
- Program staff were not required to verify that an old unit had been recycled before issuing a rebate.

Staff said retailers told them they liked the changes and not having to do the reporting, and that it is easier to participate without having to keep sales staff educated about the recycling requirements. Sales staff also indicated that the change contributed to the program staff expanding the number of retailers offering the measure, from one in 2012 to four by the end of 2013.

Although removing the recycling requirement simplified the Lighting and Appliances Program for EAI and its retailers, refrigerator recycling is considered an industry-standard program. Utilities in other jurisdictions offer turnkey refrigerator recycling programs that are well-run and cost-effective, produce significant energy savings by removing old, inefficient refrigerators from the market, and keep harmful pollutants from entering the atmosphere.

Marketing and Outreach

The introduction of new marketing tactics helped broaden the program's reach.

CLEAResult staff introduced several new marketing tactics for the program during 2013, including:

- Handing out eye-catching program materials designed to look like a coupon.
- Adapting the lead cards given out at events to include program measures, as recommended in 2012, which allows implementation staff to identify the measures and programs a customer might be most interested in talking about with staff that day.
- Increasing non-CFL measure marketing, as recommended in 2012, including direct mail campaigns for window air conditioners and LEDs.
- Offering a short-term higher incentive for compact fluorescent fixtures. This contributed to a 3% increase in energy sales for the measure during the month it was offered.

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In addition, CLEAResult introduced several new strategies to increase the program exposure in stores:

- Hanging program posters in the front windows of retailers when they participate for the first time.
- Working closely with retailers to promote CFLs through pallet and end-cap promotions and register displays.
- Conducting in-store demonstrations.

Furthermore, program staff reported that two retailers posted information about the program on their Facebook pages, and another retailer included program measures in their weekly circular. One large retailer loosened their restrictions on program signage, allowing program staff to enhance the program signage at every one of their locations.

While the Evaluation Team did not have sufficient data to quantify the direct effect of these activities on the program's performance, we believe these were positive marketing improvements.

Program Delivery and Implementation

Program staff provided expanded outreach to rural and low-income customers.

CLEAResult partnered with organizations that work with low-income populations, hosting tables at organizational events and providing program information and free CFLs to interested customers. CLEAResult also increased their focus on events and community outreach in more rural areas that may not have access to participating retailers. Program staff indicated that although these efforts did not create significant program savings, they did help promote both the Residential Lighting and Appliances Program and other EAI programs to hard-to-reach customers.

Collecting lead cards from customers at events was an effective way to support program delivery.

As noted in the Marketing and Outreach section, implementation staff collected lead cards that had been filled out by customers at events. These lead cards captured customer contact information and their interest level in certain measures and programs. CLEAResult entered all of the collected customer information into a tracking spreadsheet, which can be used for internal customer satisfaction surveys. CLEAResult staff provided each appropriate program lead with the contact information for customers who indicated they were interested in other programs. In addition, if implementation staff offered a program giveaway, they used the lead card data to verify customer status. Although the 2013 program budget did not allow for sending targeted follow-up emails to customers based on their interests indicated on the lead cards, as recommended in 2012, CLEAResult did capture customer email addresses and intends to implement email blasts during 2014.

Program Budget and Management

The reduced program budget did not negatively impact program performance.

Midyear, program staff determined that they had more money allocated for program incentives than necessary. Therefore, program staff reallocated budget from the Residential Lighting and Appliances

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Program to other programs in EAI's portfolio. The staff reduced the program budget from $4,319,000 to $2,739,393, and the program still surpassed its goals while only using 62% of the allocated 2013 budget.

Data Tracking and Reporting

EAI's new database improved data quality.

In 2013, program staff uploaded program data directly to EAI's database, ArchEE, which automatically calculated program savings. This allowed program staff to focus on verifying the saving and correcting any errors during the review.

CFL Benchmarking

Arkansas customers purchase and install CFLs at similar rates to people around country; however awareness of utility sponsored CFL discounts is relatively low.

The Evaluation Team benchmarked data collected through its residential light logging study and the Arkansas statewide leakage survey[69] against similar data from other utilities around the county.[70] The findings indicate that although the rate of CFL saturation (26.1%) in Arkansas is well within average; CFL penetration (87% per the Leakage Study and 85.3% per the Residential Light Logging Study) is slightly lower than the benchmarked average of 90.8% (Table 92).

As shown in Table 92, only 6% of the Arkansas customers reported being aware that EAI and SWEPCO offered retailer discounts on CFLs.[71] Specifically, 8% of EAI and 0% of SWPECO customers reported being aware of CFL retailer discounts. In addition, 4% of respondents who were neither EAI nor SWPECO customers indicated being aware of a CFL retailer discount. This is significantly lower than the three benchmarked utilities who reported 43%, 25% and 35% when asked a similar question.[72] However, all three of the benchmarked programs commenced in 2008 giving them a slight advantage in program maturity. SWEPCO began its CFL Program in 2009 as a coupon program before turning into a retailer discount program in 2010 and EAI's program began in 2011.

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69 The Evaluation Team combined the data collected from residential metering in both SWEPCO and EAI's territories. The leakage survey was implemented statewide.

70 Data is from a variety surveys; however not all elements were included in every survey. All reports were completed in 2012 and 2013.

71 Arkansas leakage survey program awareness question: Before receiving this survey were you aware that EAI and SWEPCO offer discounts on the price of CFLS at some retailers?

72 ComEd program awareness question: Did you know that the discount on the price of these CFLs is provided by ComEd?
Midwestern Utility IV program awareness question: Are you aware that Midwestern Utility IV offers discounts on energy-saving light bulbs sold at local stores?
Midwestern Utility V program awareness question: Did you know that the discount on the price of these CFLs is provided by Midwestern Utility V?

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However, 63% of the Arkansas statewide leakage survey respondents reported purchasing CFLs in the past twelve months. The Evaluation Team was able to obtain equivalent data from only two other utilities, which reported 35% and 67% of their customers had purchased CFLs in the past twelve months.

Table 92. CFL Data from Utility Studies

Utility	Penetration	Saturation	Awareness of Utility Discount*
Arkansas Residential Light Logging Study	85.3%	26.1%	-
Arkansas Leakage Survey	85.7%	-	6%
Midwestern Utility I	94.2%	21.8%	-
Focus on Energy	85%	31.2%	-
Midwestern Utility II	93.5%	27.8%	-
BPA Idaho	-	24.9%	-
BPA Montana	-	21.4%	-
BPA Oregon	-	21.3%	-
BPA Washington	-	27.7%	-
Midwestern Utility III	92.2%	28.5%	-
ComEd	-	-	43%
Midwestern Utility IV	-	-	25%
Midwestern Utility V In-store Interviews	93%		35%
Midwestern Utility V In-home Lighting Study	93%	33%	
Averages of Studies	90.8%*	26%	27.3%

Sources:
Light Logging Inventory Study, April to November, 2013; n=75 homes.
Arkansas statewide CFL Leakage Study, 2013; n=567 mail-in and online surveys.
Midwest Utility I: study is currently not public, completed in 2013.
Focus on Energy: study is currently not public, completed in 2013.
Midwestern Utility II: study is currently not public, completed in 2013.
BPA Data: EcoTape Inc., 2011 Residential Building Stock Assessment: Single-Family Characteristics and Energy Use, Sept., 2012.
Midwestern Utility III: study is currently not public, completed in 2013.
Navigant, Energy Efficiency/Demand Response Plan: Plan Year 5 (6/1/2012– 5/31/2013), Evaluation Report, Residential ENERGY STAR Lighting, Oct. 2013.
Midwestern Utility IV: study is currently not public, completed in 2013.
Midwestern Utility V: study is currently not public, completed in 2013.
Midwestern Utility V: in-home lighting assessment study is currently not public, completed in 2013.
* Studies representing the same geographic areas were averaged together before being included in the total average for penetration rates for all studies. Midwestern Utility V's In-store Interviews and In-home Lighting Assessment = 93%, and Arkansas Residential Light Logging Study and Leakage Survey = 87%.

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TRM

New Arkansas-specific data is a better representation of regional conditions than TRM 3.0 values.

Through our light logging study, the Evaluation Team conducted primary research, collecting residential customer data through site visits and metering. These data collection and analysis activities provided new, regional values that are more appropriate for calculating Arkansas-based energy savings than the assumed values in the TRM 3.0, which are based on secondary research in other jurisdictions.

Data Tracking and Reporting

EAI program data tracking provided necessary information in a usable format.

The final data tracking database EAI provided for evaluation was in one coherent format across months and across retailers, and provided sufficient information for savings calculation.

Evaluation Recommendations

The Evaluation Team identified a recommendation relevant to the Lighting and Appliances Program and updates to relevant TRM parameter values, which is presented in the Portfolio-Level Recommendations section of this report.

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CoolSaver Program

Through CoolSaver,[73] EAI offers incentives to homeowners and small businesses for high-efficiency tune-ups of air conditioners or heat pumps. CoolSaver tune-ups must be performed by a participating contractor, trained by the program implementer, CLEAResult, to clean the evaporator coil, blower, and condenser coil, and to precisely measure and adjust the refrigerant level according to manufacturer specifications.

EAI also offers incentives to small commercial customers to install a high-efficiency air conditioner or heat pump. Residential customers are eligible for replacement incentives, but through the HES Program. CLEAResult encourages CoolSaver contractors to also participate in HES so they can offer more incentives to their residential customers.

The CoolSaver incentives and target markets are shown in Table 93.

Table 93. CoolSaver Program Incentives and Target Markets

Measure	Eligible Customer Class	Incentive Amount	Party Receiving Incentive
High-Efficiency Tune-Up (5 tons and less)	Residential and Commercial	$175	Customer*
High-Efficiency Tune-Up (above 5 tons)	Commercial	$200	Customer*
		$150	
Air Conditioner or Heat Pump Replacement/Installation	Small Commercial	$300	Customer*

* The customer receives this incentive as an instant rebate on the contactor invoice, and EAI later reimburses the contractor.

Program Status Overview

In 2013, the CoolSaver Program surpassed goals by significant margins, achieving 299% of its energy savings goal and 282% of its demand reduction target despite meeting only 87% of its participation goal (Table 94).

[73] The program filings refer to the program as Cooling Solutions, but the implementer retained the brand name CoolSaver from the Quick Start High-Efficiency Tune-up Program.

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Table 94. CoolSaver Program 2013 Participation and Net Savings Goals vs. Actual

	Projected/Goal	2013 Actual*	Percent of Goal Achieved
Energy Savings (MWh)*	4,150	12,390	299%
Demand Savings (MW)*	1.8	5.1	282%
Participation (tune-ups)	10,061	8,751	87%
Budget	$2,406,228	$2,709,599	113%

* This column represents evaluated net savings and reflects the application of a 1.0849 line loss factor.

The Evaluation Team attributed the program's success in 2013 to several factors:

- CLEAResult shifted the program marketing focus to recruiting and supporting program trade allies, resulting in 104 trade allies in 2013, versus 39 in 2012. For example, to support trade ally promotion, staff developed and offered a contractor Welcome Packet in 2013 to transfer critical information to new trade allies (see the Marketing and Outreach section for further details).
- In addition, 74% of the active trade allies completed 10 or more tune-ups, up from 67% in 2012. This helped the program increase participation substantially over 2012 levels when the program met only 50% of its participation goal.
- EAI increased the high-efficiency tune-up incentive from $150 to $175.
- Program contractors and staff used the program to generate new leads for contractors, bringing in several multiunit commercial customers.
- Unlike in 2012, when program contractors were required to take both pre- and post-treatment field measurements, in 2013 program contractors were only required to perform post-treatment field measurements. EAI implemented this change for two principal reasons:
  - So that contractors could reduce the amount of time spent on data collection in the field, thereby making participation more appealing; and
  - So that contractors could perform certain tune-up measures, such as condenser and evaporator coil cleaning, even when conditions were not favorable for testing the EER.
- The program captured higher than expected per-unit savings, mainly because it serviced a large proportion of heat pumps. In its initial planning estimates, EAI did not account for heat pump savings in heating mode.

Other than these changes, the CoolSaver Program operated much the same in 2013 as it did in 2012, with only modest adjustments to the incentive levels. In addition to increasing the high-efficiency tune-up rebate, EAI reduced the bonus incentive for dual circuit systems from $75 to $25 and eliminated the $300 commissioning rebate for replacement equipment, since, according to the program implementer, this measure accrues no program savings.

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Status of 2012 Evaluation Recommendations

Table 95 lists the status of each of the CoolSaver Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed many of the 2012 recommendations during the 2013 program year.

Table 95. 2013 Status of 2012 CoolSaver Program Recommendations

2012 Recommendations	2013 Status
Consider reassessing program participation goals and savings per participant to more accurately reflect program results to date. This would allow the participation and savings goals to serve as tools that help the program staff assess ongoing program performance.	*In Progress/Partial.* Staff considered mechanisms to adjust its saving and participation goals, but is unable to make significant changes until the next planning cycle.
The Evaluation Team understands that transitioning to the new program may have caused unexpected delays. However, in the future, EAI and CLEAResult should aim to have program marketing materials ready for contractors well before the tune-up season begins in March, particularly materials that contractors can co-brand with their logo and business information. Making this information available before the tune-up season will improve contractor satisfaction, as well as bolster participation.	*Completed.* Program and implementation staff had marketing materials prepared at the start of the 2013 season.
If EAI continues to offer equipment replacement incentives for small business customers, adjust the marketing strategy to more actively promote replacements to both residential and commercial customers. Provide marketing materials that promote replacements for contractors to distribute, and train contractors to promote both tune-ups and the replacement incentives.	*Completed (considered and rejected).* Although marketing materials mentioned the replacement option, staff decided not to actively promote equipment replacement, as it is not cost-effective.
Develop new messaging targeted to customers who might not otherwise undertake an HVAC system tune-up, particularly those customers with high summer electric bills. Use messaging about the cost savings associated with tune-ups, as well as the extended equipment life and increased home comfort. These could be powerful messages for a bill insert, direct mail, or email sent to customers with high summer cooling bills.	*In Progress/Partial.* Although EAI revised and updated its program materials for the 2013 season, it did not introduce new materials targeting this sector.
Consider putting a structure in place to track the effectiveness of contractor marketing support. CLEAResult should establish a baseline for the type, channel, and messaging it uses in contractor marketing,	*In Progress/Partial.* CLEAResult staff tracked which materials were most popular among contractors. However, no formal system is in place to track the number of applications received in response to each

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2012 Recommendations	2013 Status
as well as benchmarks for how marketing practices change following support from CLEAResult. In addition, where possible, track changes in the number of applications submitted in response to active marketing campaigns. Over time, this type of tracking can be used to identify the most effective marketing strategies for each target audience.	type of marketing and outreach.
Continue providing diverse marketing materials and support to contractors. Reach out to CoolSaver contractors to inquire about the types of marketing materials and advertising support they would find most useful.	*Completed.* CLEAResult staff met individually with all contractors to present new materials and to learn which materials they preferred.
Streamline the call-to-action in various marketing materials so that customers are directed to as few contacts as possible. Develop a single, program-specific webpage for both questions and sign-ups, and standardize the materials to always direct customers to that page. In the same manner, ensure that all materials direct customers to a single phone number. By streamlining the points of contact, the marketing materials will reinforce the program messaging, and will allow implementation staff to more easily track marketing responses.	*Incomplete*. Staff did not completely streamline the materials. Although the materials have fewer contact points, they retain up to four contacts per document (e.g., phone, email, website). The call-to-action is still inconsistent within documents, instructing customer to call or email at one point and instructing them to visit the website at another. In addition, documents that addressed both residential and commercial customers had only the commercial contact information, while residential-specific documents have a different phone, email, and website listed.
Create a messaging hierarchy document to define the primary, secondary, and tertiary messages in the marketing plan, based on customers' motivations for participating. Marketing materials should lead with the program's primary value to customers, then discuss additional benefits. The primary, secondary, and tertiary messages should leverage participant motivators as indicated by survey results, including: saving energy, improving system performance, and capitalizing on utility incentives. Consider creating a sense of urgency on all materials (e.g., "while funds last").	*Incomplete.* Although CLEAResult staff reworked the messaging to be more consistent across materials, they did not create a messaging hierarchy.
Reinforce cross-promotion by educating all trade allies in EAI's network about every available program and their benefits, and the value and importance of cross-promotion, such as improving customer satisfaction and increasing their company's value proposition.	*Completed.* CLEAResult revised contractor training to reinforce sales techniques and cross-promotion with other programs.
Distribute a marketing brochure that promotes programs by sector (i.e., residential programs and commercial programs) to contractors and request that	*Completed.* CLEAResult staff provided sector-specific materials for both residential and commercial customers.

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2012 Recommendations	2013 Status
they leave this brochure behind for their customers that participate in EAI's programs.	
Reassess the budget based on more accurate savings per incentive dollar spent and based on an analysis of replacement incentive uptake after enhanced promotion of that option.	*Completed.* Program staff were unable to reallocate spending in 2013. Although staff applied for additional incentive funds, the request was approved too late for the 2013 program year. The additional funds will be available in 2014.
Consider reallocating a portion of unused incentive dollars to marketing or contractor recruitment, in order to directly address program barriers and increase program savings.	*N/A.* Staff increased contractor participation with the existing budget, and therefore the program dramatically increased its savings and did not have unused incentive dollars in 2013.
CLEAResult should reach out to all contractors that dropped out of the program over the past three years to ensure they are aware that the test-in is no longer required, and that EAI made other changes to streamline the program and make it easier to use.	*Completed.* CLEAResult staff reached out to all contractors during 2013, including inactive ones, to provide updated program information.
If high contractor turnover continues to be a problem in 2013, include a survey of dropped contractors in the annual evaluation to determine their reasons for not participating.	*N/A.* High contractor turnover was not a problem in 2013.
Consider adding content to the sales training. This could include focusing on the benefits to customers, cross-sales opportunities, and troubleshooting any common difficulties contractors may encounter when incorporating the program into their business model.	*Completed.* CLEAResult staff substantially revised the contractor training to incorporate more sales content. In addition, staff reached out directly to the marketing decision-makers at each participating firm.
Make the sales training more accessible. Conduct periodic webinars or host lunch-and-learn events focused on specific training areas, new technologies, and trends. Include a sales training module that covers the use of co-branded marketing materials, guest speakers, etc.	*Completed.* CLEAResult staff held face-to-face meetings with senior staff at each contractor's office to review program protocols and discuss available marketing materials, in addition to conducting the regular training for technicians.
Monitor the data collected by contractors to ensure it is complete and accurate to facilitate compressor mapping.	*Completed.* The ArchEE system* employs strict constraints on data fields, which ensures that complete and accurate data is entered into the system.

* ArchEE is the central data repository for tracking and reporting EAI's portfolio of programs that provide customer benefits, energy usage, and peak load reductions as approved by the APSC.

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Analysis Methodology

For the CoolSaver Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities:[74]

- Year End Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Participant Surveys
  - Residential (n=70)
  - Commercial (n=60)
- Nonparticipant Surveys (n=70)
- On-Site Verification Visits
  - Commercial (n=11)
  - Residential (n=31)
  - Meters installed (n=30)
- TRM Review
- Engineering Savings Analysis
- Review of Program Tracking Data
- Comparison of Qualitative Tune-Up Work (performed for systems in 2012 and 2013)
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The program achieved 87% of EAI's target participation, but exceeded its energy and demand savings goals. Nearly all program participants opted for tune-ups. Table 96 and Table 97 show the final evaluated net energy savings (kWh) and net demand reduction (kW) estimates for tune-up measures compared to the 2013 program goals. These savings values include an 8.49% adjustment from the point of savings to account for line losses.

[74] The Evaluation Team conducted a condensed process evaluation of the CoolSaver Program.

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Table 96. CoolSaver Program Net Energy Savings Results*

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)	Percent of Energy Goal Achieved
4,150	12,390	299%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 97. CoolSaver Program Demand Reduction Goal and Evaluated Net Demand Reduction

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction* (MW)	Percent of Demand Goal Achieved
1.8	5.1	282%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor.

The final claimed (*ex ante*) and evaluated (*ex post)* gross energy and demand savings for tune-up measures and program realization rates are shown in Table 98 and Table 99, respectively. These savings are estimated at the point-of-use and thus do not include line losses.

Table 98. CoolSaver Program *Ex Ante* and *Ex Post* Gross Energy Savings

Measure	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate
Commercial Tune-Ups	4,160,307	4,674,506	112.4%
Residential Tune-Ups	6,461,879	6,451,941	99.8%
Residential Heat Pump Replacement	6,910	6,910	100.0%
Total Energy Savings	10,629,096	11,133,356	104.7%

Table 99. CoolSaver Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction

Measure	*Ex Ante* Gross Demand Reduction (kW)	*Ex Post* Gross Demand Reduction (kW)	Realization Rate
Commercial Tune-Ups	2,384	2,300	96.5%
Residential Tune-Ups	2,345	2,257	96.3%
Residential Heat Pump Replacement	1	1	100.0%
Total Demand Reduction	4,730	4,559	96.4%

TRM Review: *Applicability of Efficiency Loss Value*

The air conditioning tune-up measure defined by the TRM 3.0 requires the following maintenance measures (MM) for residential or commercial CAC systems:

- MM1: Cleaning the condenser coil
- MM2: Measuring the static pressure across the fan to verify adequate airflow
- MM3: Correcting the level of refrigerant charge to the manufacturer's recommended level, if needed

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The TRM 3.0 explains that if other changes are made to the system that decrease unit energy use, implementers may claim savings by performing pre- and post-unit efficiency measurements and applying these field-tested measurements to the savings equations. The CoolSaver Program requires corrective tune-up maintenance services in addition to those listed in TRM 3.0. The CoolSaver Program also requires:

- MM4: Evaporator coil cleaning
- MM5: Blower assembly cleaning
- MM6: Clean/replace air filter

Intuitively, each measure listed in MM1-MM6 has the potential to improve an air conditioner's operating efficiency. The TRM 3.0 savings algorithm, however, only provides savings estimates if refrigerant charge is adjusted. The TRM uses a deemed value for efficiency loss based on the amount of refrigerant charge adjusted. The energy and demand savings algorithms for air conditioner tune-ups are:

$$EER_{before} = (1 - eff\ loss) \times EER_{after}$$

$$\Delta kWh = rating\ of\ unit\ (tons) \times EFLH_{cooling} \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}}\right)$$

$$\Delta kW = rating\ of\ unit\ (tons) \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}}\right) \times CF$$

We determine deemed efficiency loss values by calculating the percentage of change in the mass of refrigerant charge adjustment. For example, if a unit has 4 lbs. of nominal refrigerant according to the nameplate, and 1 lb. of refrigerant was added to properly tune the unit, that unit was 25% under-charged and the corresponding efficiency loss is 0.29 (see Table 100).

Table 100. Efficiency Loss Percentage by Refrigerant Charge Level

Fixed Orifice		Thermostatic Expansion Valve	
Percent Charged	Efficiency Loss	Percent Charged	Efficiency Loss
≤70	0.37	≤70	0.12
75	0.29	75	0.09
80	0.20	80	0.07
85	0.15	85	0.06
90	0.10	90	0.05
95	0.05	95	0.03
100	0.00	100	0.00
≥120	0.03	≥120	0.04

TRM 3.0 states that the values presented in Table 100 should be "determined by averaging reported efficiency losses from multiple studies," and provides five studies for reference. To understand the applicability of the TRM 3.0 algorithms to the CoolSaver Program, the Evaluation Team reviewed these

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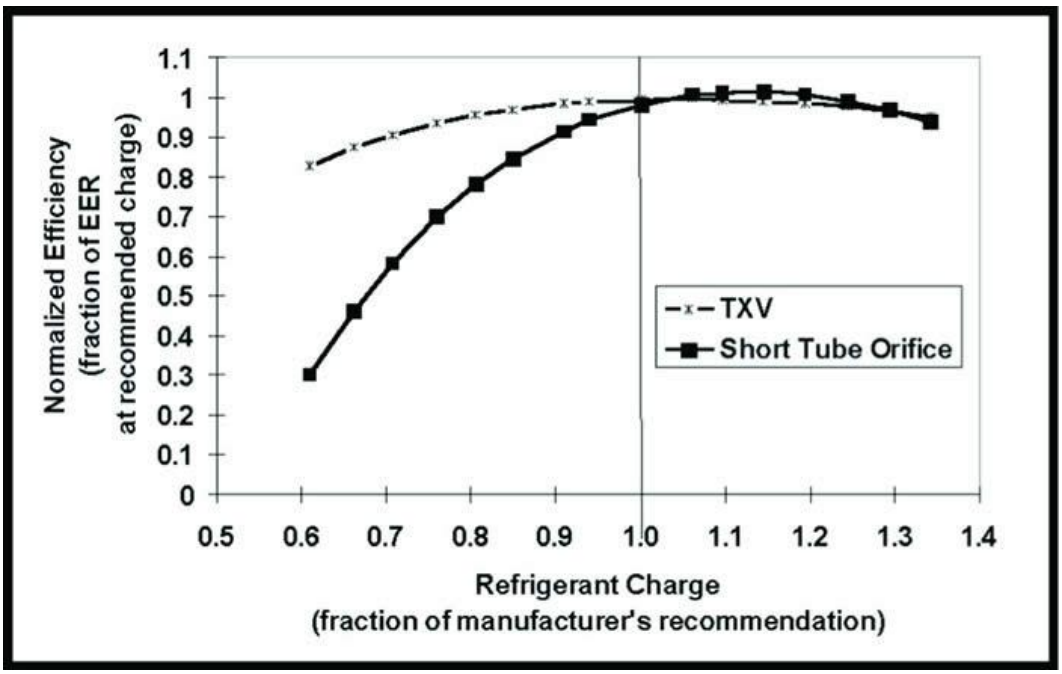
five studies and found that they report efficiency loss as being dependent on refrigerant charge only, and do not mention the benefits from the four other tune-up maintenance measures that can improve efficiency.

As a comparison, the values the Evaluation Team calculated in Table 100 appear to closely match the values shown Figure 44 below, which represents the effect of adjusting refrigerant charge only.

Figure 44. Refrigerant Charge Adjustment vs. Efficiency Loss



Source: http://www.proctoreng.com/utilities/Charge.html

Below, we summarize the Evaluation Team's findings from our review of the studies listed in TRM 3.0.

The first study, completed by Architectural Energy Corporation, did not include testing the efficiency of air conditioners; it merely tested the accuracy of refrigerant charge in rooftop units. The data shown in Figure 45 was included in the study, but appears to have been derived from modeled or laboratory test data (no additional information was provided). The results are very similar to those shown in Figure 44, which represents laboratory testing of efficiency change by varying only refrigerant charge.

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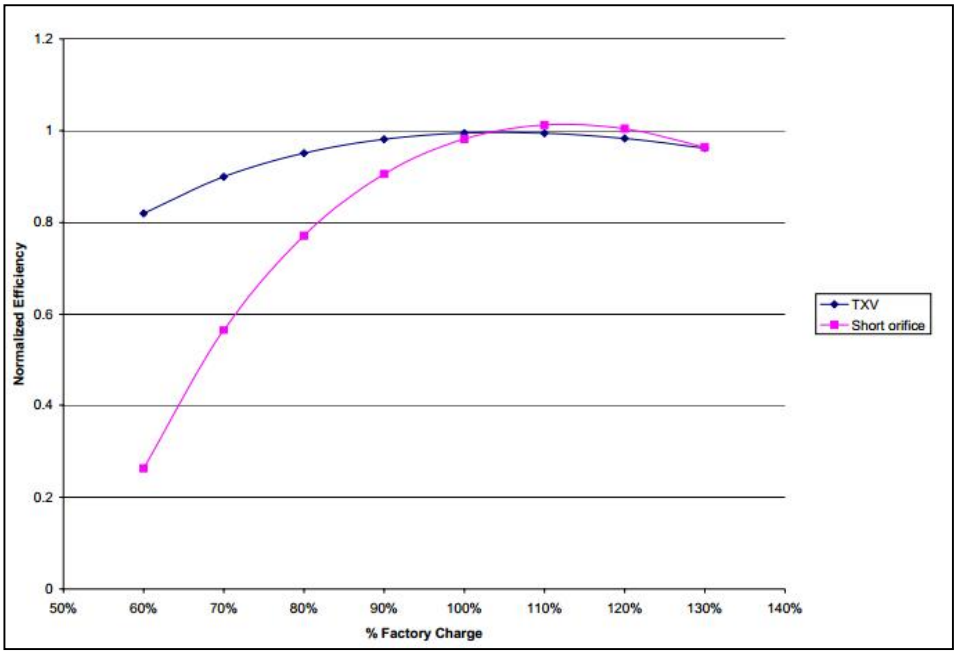
Figure 45. TRM Source #26: Architectural Energy Corporation*



* TRM source 26: Architectural Energy Corporation, managed by New Buildings Institute. "Small HVAC System Design Guide." Figure 11. Prepared for the California Energy Commission. October 2003.

Figure 46 shows the results of research conducted by Davis Energy Group, the second of the five TRM 3.0 studies. The Team found that the study team modeled these results by adjusting refrigerant charge only.

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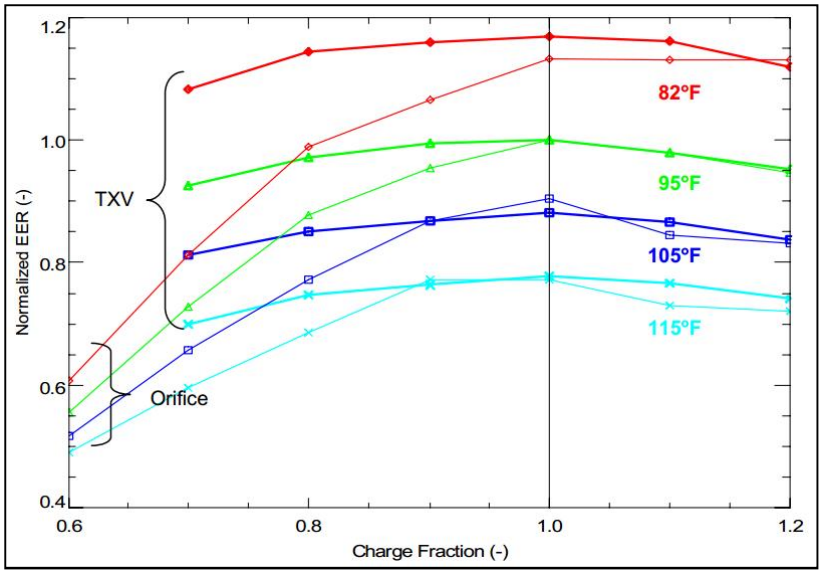
Figure 46. TRM Source #27: Davis Energy Group*



* TRM source 27: Davis Energy Group. "HVAC Energy Efficiency Maintenance Study." California Measurement Advisory Council (CALMAC). Figure 14. December 29, 2010. The source for this chart is: "Influence of the Expansion Device on the Performance of a Residential Split-System Air Conditioner," Report No. 491-01.4, PG&E, Technical Application Services, January 2001.

The third of the five studies listed in TRM 3.0 cites "Innovative Peak Load Reduction Program CheckMe!® Commercial and Residential AC Tune-Up Project." The Evaluation Team was unable to locate this report. However, we note that CheckMe operates differently than CoolSaver. CheckMe is operated and was designed by Proctor Engineering Group, which is responsible for the data in Figure 44. Proctor Engineering Group also produced the fourth study, which cites "PEG Tune-Up Calculations spreadsheet." The Evaluation Team was unable to locate this spreadsheet.

The fifth TRM 3.0 study refers to the Pennsylvania TRM, which has a table correlating refrigerant charge adjustment to savings. The source for this table is "CA 2003 RTU Survey." The Evaluation Team was unable to locate this study, but the title indicates the savings may not be applicable for split HVAC system tune-ups. Without more information about this study, we were unable to assess the applicability of the data.

Our review of the sources cited in TRM 3.0 indicate that savings from tune-up maintenance measures that are other than refrigerant charge adjustments have not been accounted for in the Arkansas TRM 3.0.

TRM Review: *Full Load Hours*

The Team used the TRM 3.0 EFLH values for heating and cooling. For commercial participants, if the facility type was unknown, we used the average EFLH value of all measures reported in the same weather zone. (Residential measures have only one EFLH value for each weather zone.) Table 101 shows

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the average EFLH value for each commercial building type for all the program measures reported in 2013.

Table 101. List of EFLH Values Used to Estimate Energy Savings

Building Type	Average EFLHc Value
School	1,494
Residential	1,272
Small Office	1,557
Health Clinic	2,019
Fast Food	2,331
Lodging	1,598
Large Office	1,702
Other	1,599

TRM Review: *Savings Algorithm*

The TRM 3.0 energy and demand savings algorithms appropriately estimate savings resulting from a tune-up under the following conditions:

- Seasonal pre and post capacity remain unchanged
- The efficiency loss at the time of measurement is equivalent to the efficiency loss at full load conditions
- The efficiency improvement from measured EER is applicable to the heating seasonal performance factor (HSPF)

Details of the Team's understanding of the first two points are provided in the Engineering Savings Analysis section.

The TRM 3.0 provides a savings algorithm that includes the energy savings due to efficiency improvement of a heat pump in heating mode:

$$\Delta kWh = rating\ of\ unit\ (tons) \times \left[EFLH_{cooling} \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}} \right) + EFLH_{heating} \times \left(\frac{12}{HSPF_{before}} - \frac{12}{HSPF_{after}} \right) \right]$$

The TRM states: "Heating savings can only be claimed if HSPF is measured on site before and after the tune-up. Site measurements should be taken during the same site visit. If site measurements cannot be taken during the same site visit, the measurements should be taken during similar weather conditions."

Unlike EER, which is determined from spot measurements, HSPF cannot be measured on-site because it includes the seasonal energy consumption of electric resistance strip heat. The Team reviewed a

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database of various heat pump nameplate efficiency values. We developed a correlation of HSPF to EER and found:

$$HSPF = 0.3342 \times EER + 3.9871$$

We used this equation to estimate HSPF values for heat pumps from reported EER values.

Because the TRM 3.0 may not accurately estimate savings from a CoolSaver tune-up, the Team opted to perform a detailed engineering review of pre- and post-tune-up data to estimate the efficiency loss of a tune-up performed under the CoolSaver Program.

Engineering Savings Analysis

The Team performed an exhaustive review of the 2012 measurements reported by contractors. This review included:

- Examination of contractor measurement error
- Examination of bias in savings estimation
- Review of EER measurements using compressor mapping
- Review of qualitative data to confirm applicability of 2012 measurements to 2013 tune-ups

Contractor Measurement Error

The proper calculation of pre- and post-EER requires measurement of:

- Airflow speed
- Cross-sectional area of return grill(s)
- Compressor volts
- Compressor amps
- Blower volts
- Blower amps
- Return air dry bulb temperature
- Return air wet bulb temperature
- Supply air dry bulb temperature
- Supply air wet bulb temperature
- Outdoor air temperature

Contractors must perform these measurements twice: once before and once after the tune-up. If any of the measurements is incorrect or performed at the wrong time,[75] the calculated EER value will be inaccurate. In other words, it is expected that some error will exist around the calculated EER values.

[75] Protocol requires the HVAC system to be running in steady state. Contractors might not wait long enough before recording measurements.

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CLEAResult has a QC process in place to flag and correct problematic data; however, even with this process in place, we found questionable or erroneous values in approximately 10% of the reported pre and post measurements.

The main sources of measurement or data entry error were:

- Post EER measurements taken when condenser coil was still wet (e.g., liquid line temperature colder than outdoor dry bulb temperature)
- Data entry (e.g., blower power entered incorrectly)
- Normalized capacity/efficiency did not appear realistic. In these cases, all of the measurements used to estimate these values were suspect.

Rather than attempting to adjust the problematic EER values we identified, the Team removed them from the analysis.

Bias in EER Measurement

The Team reviewed the data reported by contractors to confirm that the EER improvement was not biased in a manner that increased energy savings. We performed the following activities.

- Recalculated enthalpy (Btu/lb) using contractor-reported measurements rather than the capacity (Btu/lb) value estimated by CLEAResult.
  - We found enthalpy values (based on supply and return air wet bulb and dry bulb temperatures) were accurately calculated.
- Investigated mass flow measurements calculated from contractors' airflow measurements.
  - We found mass flow of air was properly calculated from the inputs measured by contractors.
- Confirmed power factor was estimated and constant for pre- and post-EER estimates.
  - We found the assumed power factor was 0.85 for both the pre- and post-power (kW) estimates. This assumption precludes the possibility that power factor might change due to a tune-up, but further research did not reveal conclusive data about the effect of tune-ups on power factor.
- Reviewed CLEAResult's AHRI capacity and EER normalization technique.
  - We found that CLEAResult based its normalization techniques on manufacturer nominal values. Though these might not represent a system that is operating outside of design specifications (e.g., operating with low refrigerant charge), our investigation revealed that CLEAResult's normalization technique reduced the savings estimated using the TRM 3.0 algorithm, which does not specify any EER normalization techniques. This review also satisfied the TRM assumption noted above, that "the efficiency loss at the time of measurement is equivalent to the efficiency loss at full load conditions" because the corrected EER values used by CLEAResult effectively decrease savings.
- Review of EER values and applicability of TRM 3.0 algorithm.
  - As post-tune-up EER values decrease, savings calculated using the TRM algorithm increase. The

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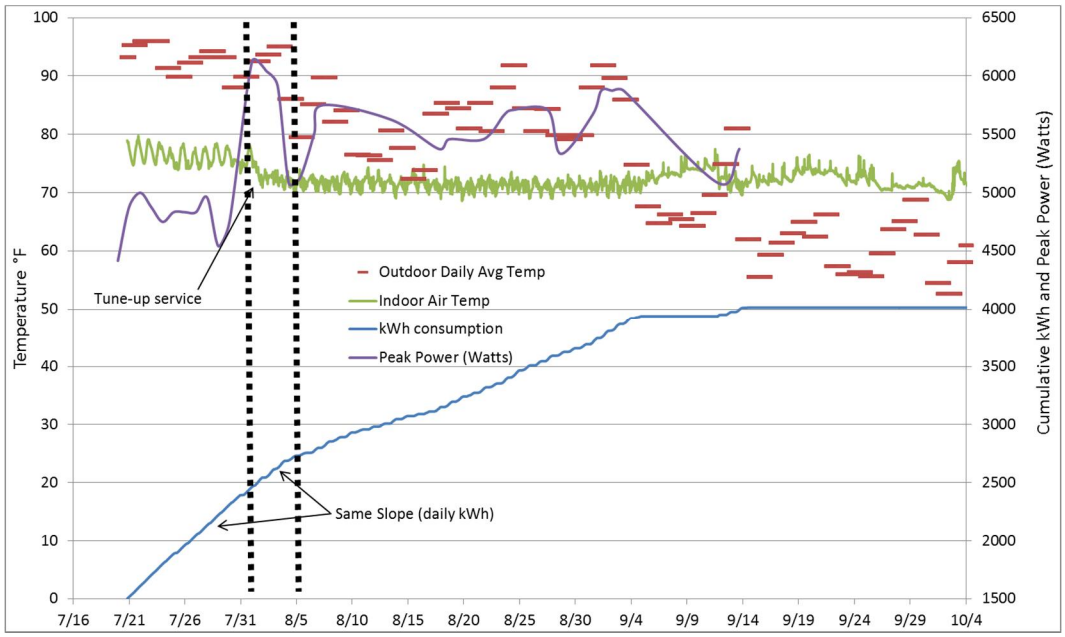
Team reviewed the EER values to ensure they were reasonable and that the TRM 3.0 algorithm was technically correct. Further explanation is provided below.

As stated above, the TRM algorithm assumes seasonal pre- and post- heating and cooling capacity remains unchanged. However, the Evaluation Team's research indicates that EFLH[76] values in the TRM algorithm are inaccurate under certain circumstances. Consider an example from a Cadmus metering study. Figure 47 shows data captured for an HVAC system that was operating in an undercharged state for years before being tuned up in August. According to meter data, before the tune-up the system ran continuously, with daily peak demand ranging from 4.5 to 5 kW. After refrigerant was added, the peak demand increased by about 30%. Also, before the tune-up, the indoor temperature setpoint was never satisfied because the system could not provide sufficient cooling capacity. After the tune-up, the HVAC system operating efficiency significantly improved; however, the daily energy consumption relative to CDDs remained the same because the tune-up allowed the HVAC system to achieve the indoor temperature (green series line in Figure 47) which increased the home's cooling demand.

Figure 47. Tune-Up Data on an Undercharged System



Source: Cadmus metering study.

This situation is common for undercharged systems or systems operating at significantly less than expected cooling capacity. Technically, correct use of the EFLH values in the TRM 3.0 algorithm requires assuming that a system provides nameplate cooling capacity both before and after the tune-up. In reality, systems with a pre-tune-up EER that is lower than the nameplate rating (because of low cooling capacity) run longer before requiring a tune-up, and the EFLH must be adjusted.

[76] The TRM 3.0 EFLH values were derived from modeled seasonal heating and cooling capacity.

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Consider the following example:

- EER_{pre}: 4.0 (Capacity: 12,000 Btu/h; demand: 3 kW)
- EER_{post}: 8.0 (Capacity 36,000 Btu/h; demand: 4.5 kW)[77]
- Nominal Tons: 3
- TRM EFLH: 1,500

When pre- and post EER are known, the TRM savings algorithm is:

$$\Delta kWh = rating\ of\ unit\ (tons) \times EFLH_{cooling} \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}}\right)$$

Technically the TRM 3.0 algorithm is incorrect, because it assumes that the unit rating (tons) is constant. The unadjusted savings algorithm is:

$$\Delta kWh = 3\ tons \times 1{,}500\ hrs \times \left(\frac{12}{4} - \frac{12}{8}\right) = 6{,}750\ kWh\ saved$$

When we break down the algorithm to show the pre- and post-consumption based on actual observed measurements, the difference in savings (a negative number) reveals this estimate is inaccurate:

$$kWh\ consumed, pre = 1\ ton \times 1{,}500\ \text{hrs} \times \left(\frac{12}{4}\right) = 4{,}500\ kWh$$

$$kWh\ consumed, post = 3\ tons \times 1{,}500\ \text{hrs} \times \left(\frac{12}{8}\right) = 6{,}750\ kWh$$

The 4,500 kWh consumption value from pre-measurements is incorrect because the EFLH is understated. Because this unit is supplying cooling capacity at 33% of the rate it was designed to supply, the EFLH should be adjusted accordingly. For the pre-tune-up cooling capacity to equal the post-tune-up capacity, the EFLH must be multiplied by a factor of 3: in other words, 4,500 EFLH would be needed to supply the same cooling capacity before the tune-up. Using 4,500 EFLH in the TRM 3.0 algorithm results in total energy consumption of 13,500 kWh. This may be incorrect because an air conditioning system would not run for 4,500 hours in most facilities (consider a heat pump, which can run in both heating and cooling mode but only for 8,760 hours per year). Instead, we set a runtime limit based on the facility type and bin temperature analysis of weather at the facility location. By limiting the energy consumption prior to the tune-up, we can calculate a conservative savings estimate.

In this example, we assume a maximum runtime before the tune-up of 3,200 hours:

$$kWh\ consumed, pre = 1\ ton \times 3{,}200\ \text{hrs} \times \left(\frac{12}{4}\right) = 9{,}600\ kWh$$

[77] It is not uncommon for units that are low on refrigerant charge to have an increase in demand after a tune-up.

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The savings is the difference between this number and the 6,750 post-consumption value shown above, or 2,850 kWh. This is 42% of the TRM 3.0-based savings estimate, which does not consider the operating condition of the system before it is tuned-up.

To obtain a pre- and post-EER value for each measure, to the Team back-calculated a pre-EER value. The result of 5.625 is more conservative (higher) than the measured value, and leads to a more realistic savings estimate than the assumed 4.0 EER.

This approach may seem overly conservative, but tune-ups do not save as much energy as typically assumed. In the example tune-up shown in Figure 47, although the homeowner did not notice a change in his utility bill, he did notice a major improvement in indoor conditions and said it took significantly less time to cool his home.

TRM Methodology Versus Modified EER Values

The Evaluation Team determined whether we needed to limit the total number of run hours for any system by using TRM 3.0 EFLH to calculate total seasonal cooling capacity. The following algorithm is used to estimate total capacity:

$$Seasonal\ Capacity\ kBtu = (EFLH) \times (tons) \times 12\frac{kBtu}{Ton}$$

In the example of an undercharged system, we assumed the unit runs more than expected because it supplies less cooling capacity than it was designed to supply. At some point the unit will run constantly when cooling is required. We assumed that a maximum 3,400 run hours per home per season.[78]

As described in the example above, the EFLH value changes when system capacity changes; failure to consider this change results in unreasonable savings estimates.

Figure 48 shows the capacity curve that results when EFLH is calculated with seasonal capacity kept constant. On this curve, we've labeled the TRM value and bin temperature hour value limit.

When the test-in capacity is less than the value identified in the figure, the bin temperature hour limit and the test-in capacity are used in the same way as the pre- and post-consumption example described with equations above. For this example in Figure 48, any time the test-in capacity is less than 1.8 tons, the bin temperature hours should be used to calculate pre-tune-up kWh. After this point, the system cannot provide the total seasonal cooling capacity anticipated and the savings equation diverges from a reasonable estimate.

[78] The Team based this 3,400 hours on our review of meter data from undercharged systems, performed in the Midwest. We tested various estimates and incorporated weather adjustments from the Midwest study to Arkansas normal weather (from 3,000-4,000 hours); we found that the impact on the final savings values was minimal.

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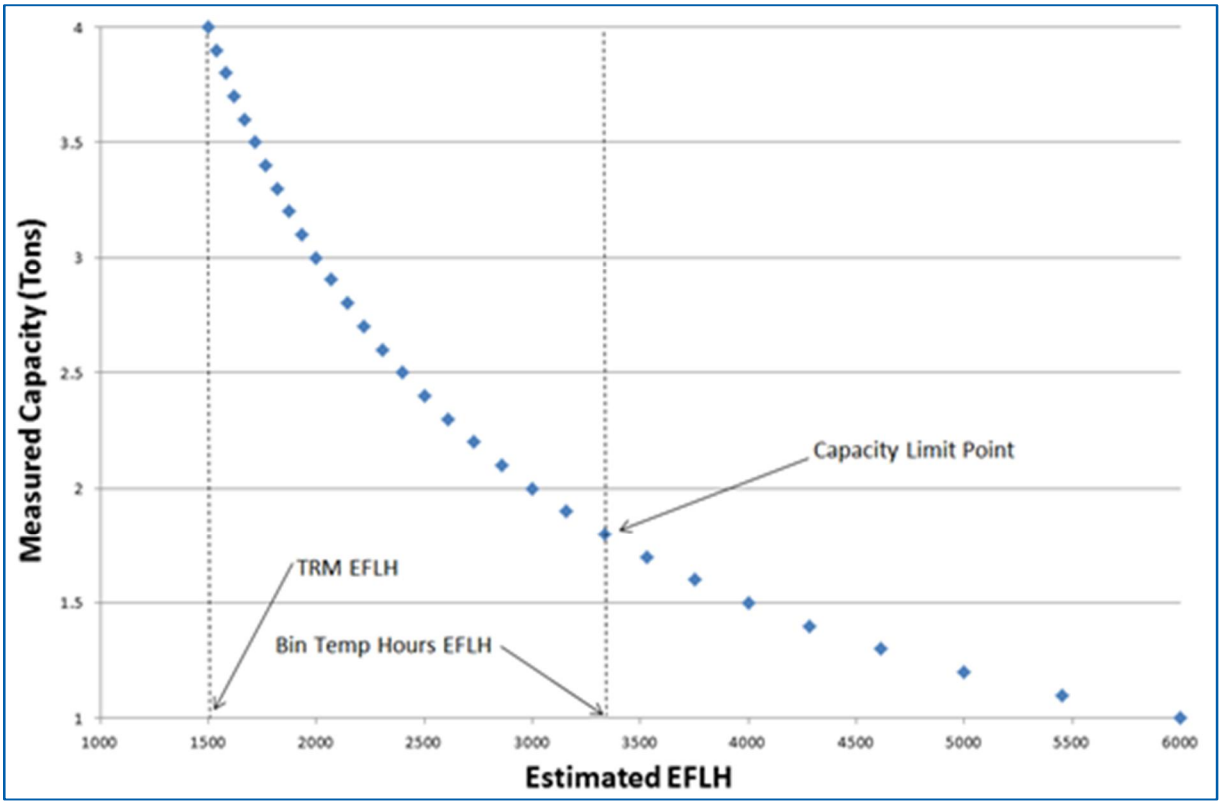
Figure 48. Identifying Capacity Limit for a 4-Ton HVAC System



Source: Evaluation Team analysis.

To summarize, if the estimated EFLH did not exceed the Capacity Limit Point, the Evaluation Team used the standard TRM 3.0 savings calculation methodology. This was the case for 94% of our measurements. When the estimated EFLH exceeded the Capacity Limit Point (the capacity was less than 1.8 as shown in the example above), we used the alternate savings methodology. This affected approximately 6% of our calculations.

The Team also used this methodology to validate the EER values in the 2013 database. We adjusted EER values for approximately 5% of the measurements.

Review of EER Measurements Using Compressor Mapping

Compressor mapping is a method of estimating refrigerant capacity using a 10-coefficient polynomial empirical model (defined by ARHI 540 standard) and refrigerant diagnostic data reported by contractors to determine the difference between pre- and post-tune-up capacity and efficiency. We compared this difference to the program implementer's pre- and post-tune-up efficiency estimates. Under the right

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conditions,[79] estimating efficiency with compressor mapping is more accurate than estimating efficiency using air temperatures and airflow rate.

The compressor mapping method relies on the following inputs to calculate tune up savings:

- Total system power (evaporator fan, condenser fan, compressor)
- Enthalpy of liquid line (requires liquid line temperature and pressure)
- Enthalpy of suction line (requires suction line temperature and pressure)
- Compressor type (scroll/screw, to determine mass flow of refrigerant, $\dot{m}$)
- Outdoor ambient temperature (to adjust efficiency to standard conditions)

In 2012, contractors collected all of these measurements before and after the tune-up for use in estimating EER:

$$EER = \frac{Capacity\ (Btus)}{Power\ (W)} = \frac{\dot{m}\ \times \Delta\ refrigerant\ enthalpy}{Power}$$

Power and refrigerant enthalpy change are easily measured, and these measurements are very reliable.[80] Mass flow is calculated by compressor mapping using the following equation:

$$\dot{m} = c_1 + c_2 S + c_3 D + c_4 S^2 + c_5 S \cdot D + c_6 D^2 + c_7 S^3 + c_8 D \cdot S^2 + c_9 S \cdot D^2 + c_{10} D^3$$

Where:

S	=	The saturation temperature of refrigerant in the suction line
D	=	The saturation temperature of refrigerant in the liquid line

Mass flow cannot be measured in the field, so the Team used manufacturer compressor maps. Compressor manufacturers provide 10 coefficients (c_1 - c_{10}). We adjusted mass flow from this algorithm using ARHI 540 compressor mapping functions that adjust for super heat.

Our purpose with this evaluation effort was to determine if CLEAResult's efficiency estimates were reliable. For this reason, the Evaluation Team used data that was favorable for calculating relatively accurate mass flow from compressor mapping. To compare the most reliable data possible, we removed systems with super heat near zero and those with very high super heat from the random sample. CLEAResult's method is not subject to this type of variable accuracy because airflow and air enthalpy

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79 Compressor maps are developed to estimate the mass flow of refrigerant through a compressor when the compressor is properly charged. Most compressor maps state the charge is 25°F superheat. When the system is undercharged and super heat is higher than this, and when the system is overcharged (resulting in low super heat), the compressor map accuracy decreases. See the Accuracy of Methods section below.

80 Enthalpy cannot be calculated in certain cases where a system is extremely undercharged and there is presence of refrigerant vapor in the liquid line (no subcooling).

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measurement accuracy does not change significantly across the range of HVAC operating conditions. The accuracy of these methods is further described below.

Comparison of Results Using Three Methodologies

Table 102 compares results of CLEAResult's method, the compressor mapping method, and the TRM 3.0 method to calculating EER. The Team evaluated 41 randomly selected systems. Note that 17 systems have no savings with the TRM methodology because there was less than 5% refrigerant charge adjustment.[81]

Table 102. Efficiency Comparison by Method

Random Sample #	CLEAResult			Compressor Mapping			TRM		
	Test In EER	Test Out EER	Δ EER	Compressor Mapping EER		Δ EER	% Mass Change Refrigerant	TRM Eff Loss	TRM Calculated EER Pre
				Test-in	Test-out				
1	11.3	15.1	3.8	6.9	12.3	5.4	12%	0.06	11.6
2	5.7	8.4	2.7	4.2	5.8	1.6	0%	0	5.8
3	6.0	8.5	2.5	5.4	6.4	1.0	19%	0.07	5.9
4	13.7	14.7	1.0	8.1	9.3	1.2	0%	0	9.3
5	9.0	8.9	-0.1	5.9	7.0	1.1	8%	0.1	6.3
6	10.2	11.4	1.2	5.9	8.8	2.9	-1%	0	8.8
7	10.7	9.5		7.2	7.8	0.6	19%	0.2	6.2
8	5.4	8.4	3.0	8.0	8.3	0.3	10%	0.05	7.9
9	6.6	6.4	-0.3	5.3	6.0	0.7	25%	0.29	4.3
10	6.6	16.4	9.8	5.9	11.9	5.9	-9%	0.03	11.5
11	13.0	17.2	4.2	10.4	12.0	1.6	0%	0	12.0
12	5.5	6.0	0.5	4.3	6.4	2.0	20%	0.07	5.9
13	8.3	11.2	2.9	6.1	7.0	0.9	2%	0.05	6.7
14	10.0	13.6	3.5	7.1	7.9	0.8	10%	0.1	7.1
15	4.2	11.8	7.5	5.5	8.0	2.5	0%	0	8.0
16	7.1	8.3	1.2	6.0	6.8	0.7	0%	0	6.8
17	16.4	19.4	3.0	9.5	13.1	3.6	0%	0	13.1
18	10.4	16.3	5.9	9.7	10.1	0.4	21%	0.09	9.2
19	14.4	10.0	-4.4	10.6	10.2	-0.4	9%	0.05	9.7
20	13.3	18.3	5.0	8.1	12.0	3.9	20%	0.07	11.2
21	13.8	12.4	-1.4	7.6	8.3	0.7	10%	0.05	7.9
22	2.0	2.8	0.8	3.7	5.8	2.2	-2%	0	5.8
23	9.9	11.9	2.0	6.3	7.3	1.0	0%	0	7.3
24	9.2	11.2	1.9	8.1	10.0	1.8	0%	0	10.0
25	10.7	11.6	0.9	7.7	7.6	0.0	10%	0.1	6.9

81 This metric was not always tracked by the program implementer. It is likely that some of these systems received greater than a 5% adjustment, but that data was missing from the tracking database.

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Random Sample #	CLEAResult			Compressor Mapping			TRM		
	Test In EER	Test Out EER	Δ EER	Compressor Mapping EER		Δ EER	% Mass Change Refrigerant	TRM Eff Loss	TRM Calculated EER Pre
				Test-in	Test-out				
26	5.8	11.9	6.1	5.6	10.2	4.5	8%	0.1	9.1
27	12.2	14.7	2.5	10.0	12.4	2.4	7%	0.05	11.8
28	11.2	7.1	-4.2	10.4	9.0	-1.4	18%	0.07	8.3
29	11.3	11.3	0.0	5.9	8.0	2.1	0%	0	8.0
30	8.4	8.8	0.4	9.1	11.8	2.7	21%	0.09	10.8
31	6.1	7.0	0.9	7.0	6.8	-0.2	-8%	0.03	6.6
32	11.9	11.9	0.0	7.9	11.4	3.5	0%	0	11.4
33	13.9	15.5	1.6	8.0	9.9	1.9	0%	0	9.9
34	4.1	8.3	4.2	4.6	7.5	2.9	-43%	0.03	7.3
35	4.8	6.9	2.1	4.0	6.7	2.7	-35%	0.03	6.5
36	5.8	12.3	6.4	5.0	6.0	1.0	0%	0	6.0
37	11.2	11.2	0.0	8.9	9.3	0.5	0%	0	9.3
38	8.5	10.0	1.5	7.5	8.7	1.2	26%	0.37	5.5
39	9.3	11.4	2.1	7.6	9.3	1.6	0%	0	9.3
40	14.5	15.7	1.3	9.7	11.3	1.6	4%	0.03	11.0
41	15.8	16.0	0.2	7.3	8.6	1.3	0%	0	8.6
	9.5	11.4	2.0	7.1	8.9	1.7	0.956	0.05	8.404

*Totals may not sum due to rounding

The average efficiency improvements from the sample of pre- and post-measurements for the three methods are:

- CLEAResult = 17.3%
- Compressor mapping = 19.5%
- TRM = 5.3%

The EER estimates from the Evaluation Team's compressor mapping were lower than CLEAResult's estimates, but the percentage efficiency improvement of EER values determined by compressor mapping was greater, resulting in a higher evaluated savings estimate than CLEAResult's estimate. The pre- and post-tune-up efficiency changes between these two methods are within the uncertainty of the measurement error.

The Team accepted[82] the pre- and post-EER 2012 database values from CLEAResult as reasonable, conservative, and representative of a program tune-up. Savings estimates based on the TRM 3.0 are much lower than the CLEAResult's savings estimates and those from compressor mapping. A direct comparison of methods is not possible because compressor mapping is not accurate under certain

[82] We accepted these after making some adjustments. See the Bias in EER Measurement section.

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conditions (described above) and the primary objective was to compare the savings estimated by CLEAResult to savings estimated with compressor mapping.

Accuracy of Methods:

All methods of assessing efficiency improvement in the field entail some uncertainty. CLEAResult's method requires airflow measurement (generally ±10% accurate), enthalpy based on supply and return temperature measurements (generally ±5% accurate), and power measurements (generally ±2% accurate, assuming no change in power factor pre- and post-tune-up).

The compressor mapping method requires calculating enthalpy based on pressure and temperature measurements, which are ±3% accurate. Mass flow is a function of compressor mapping curves, which varies based on a specific super heat value. In other words, accuracy is reduced as super heat deviates from the manufacturer's test condition. Compressors are tested under a constant set of conditions (constant super heat). If the refrigerant gas flowing through the compressor varies significantly from the conditions in which it was tested, the accuracy of the compressor map decreases. If super heat is very low, for example, the gas coming in is colder and denser than the refrigerant gas under the manufacturer test condition, which in turn affects the accuracy of the compressor map. The accuracy of mass flow by compressor mapping from field test measurements is generally accepted as ±10%.

The Evaluation Team cannot fully assess the accuracy of the TRM 3.0 method for the CoolSaver Program. The TRM method is reasonable when a tune-up only adjusts refrigerant charge and does not allow for savings resulting from other tune-up measures. CoolSaver tune-ups generate energy savings from additional measures, such as coil and blower cleaning that result in efficiency improvement. Because the TRM savings estimates are based on a reduced set of activities and rely on data from jurisdictions with different program designs and climate conditions that are not similar to those in Arkansas, the TRM 3.0 method appears be less accurate than the other two methods described.

Review of Qualitative Data to Confirm Applicability of 2012 Tune-Ups to 2013 Tune-Ups

The Team reviewed the methods and requirements of both the 2012 and 2013 programs to determine whether the efficiency improvement from a tune-up in 2012 might reasonably represent the efficiency improvement of a tune-up in 2013. We found a substantial difference in systems requiring refrigerant charge adjustment in 2012 and systems requiring this adjustment in 2013:

- In 2012, over 80% of systems required refrigerant charge adjustment
- In 2013, only 51% of systems required refrigerant charge adjustment

In 2013, the program required that all tune-up maintenance measures be performed unless absolutely not needed. The main components of a tune-up are:

- MM1: Cleaning the condenser coil
- MM2: Measuring the static pressure across the fan to verify adequate airflow

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- MM3: Correcting the level of refrigerant charge to the manufacturer's recommended level, if needed
- MM4: Evaporator coil cleaning
- MM5: Blower assembly cleaning
- MM6: Clean/replace air filter

Our review of the program data indicated that contractors performed more of this maintenance in 2013 than in 2012, possibly because it was a strict requirement of the 2013 program. A contractor was required to record full pre- and post-tune-up measurements if they could not perform any one of the required maintenance measures. Since the main disparity between the tune-ups performed from one year to the next was refrigerant charge adjustment, the Team calculated savings separately for systems that did and did not receive refrigerant charge adjustment.

Review of Program Tracking Data

The Team reviewed all tracking data collected by contractors and reported to the program implementer. To satisfy the data review, the Team:

- Checked for duplicate records
- Ensured the dates fell within the program year
- Checked to see that all fields needed to estimate TRM values are present
- Checked for missing data in key fields
- Checked for out-of-range values
- Performed a detailed engineering review to confirm the data were reasonable (described in the Engineering Savings Analysis section)

Site Visits: Field Verification and Metering of HVAC Systems

During the week of August 20, 2013 the Team performed 31 site visits to verify that HVAC systems were tuned up (serviced in any way) by talking to homeowners, observing the cleanliness of the coils, noting the CoolSaver dated sticker, and by verifying refrigerant charge and airflow. To verify systems were tuned-up correctly, we recorded the following measurements:

- Airflow;
- Condenser power;
- Refrigerant temperatures and pressures;
- Supply and return air temperatures and humidities; and
- Outside ambient air temperature

We confirmed that one of 31 systems was incorrectly tuned-up, specifically, it was overcharged: it had a high subcooling value that was outside the range of the tolerated deviation from the target subcooling

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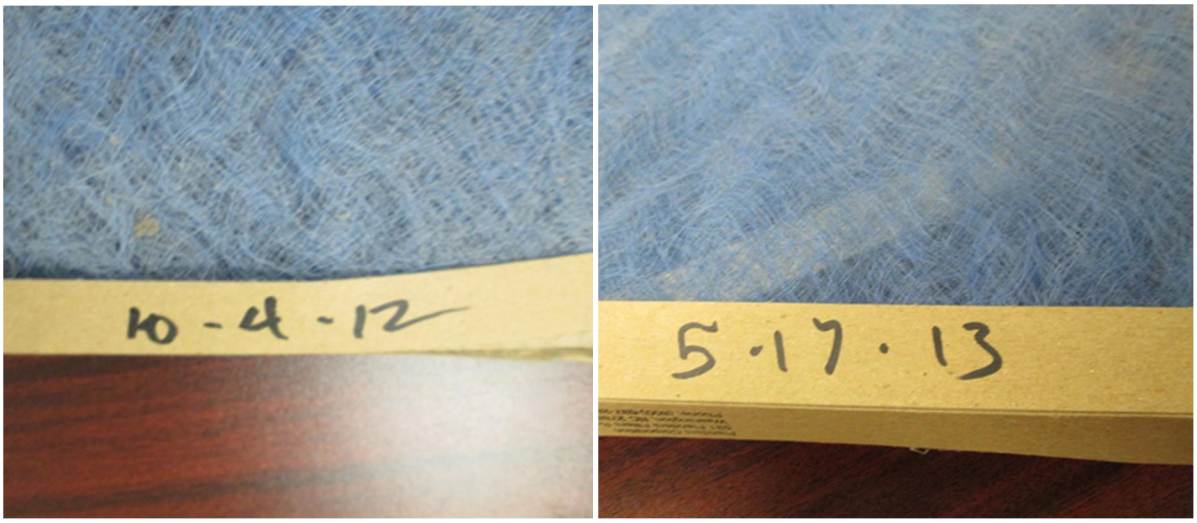
temperature.[83] Although the refrigerant charge deviated from the manufacturer's recommended level, we have no basis for adjusting savings based on this observation.

The Team also verified 11 commercial tune-up units using the same criteria described above. One of the commercial units was overcharged; it had very low super heat and high subcooling values. We did not adjust savings due to this unit being overcharged for the following reasons:

- The sample size of commercial units was small (n=11).
- The savings impacts of this finding cannot be calculated because we did not know what the initial condition of the unit was.
- We used the average of all pre- and post-tune-up measurements in 2012, which included several tune-ups that resulted in negative savings impacts.

We also observed several systems with dirty air filters. In particular, the unit with refrigerant charge issues had a dirty air filter dated before the tune-up was performed. Figure 49 and Figure 50 show images of a filter that was not changed, but for which the contractor merely rotated the filter and wrote a new date.

Figure 49. Example of Filter Not Changed



[83] ACCA standard allows ±5°F of the original equipment manufacturer (OEM) target subcooling value for fixed orifice systems.

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Figure 50. Filter Rotated, Not Changed

Though the Evaluation Team found some anomalies, in general the CoolSaver systems we verified had been properly tuned and were operating as expected. Several homeowners noted the contractor(s) were "there for quite a while, taking [the evaporator coil] apart and running all sorts of tests."

Final Gross Savings Calculation Methodology

Based on the findings and conclusions resulting from the research activities described above, the Evaluation Team calculated new efficiency loss values that differ from those listed in the TRM 3.0 (provided in Table 103).

Table 103. Measured Efficiency Change from a CoolSaver Tune-Up

Measure	Evaluation Findings	TRM 3.0
Any refrigerant adjustment with all other corrective measures	16.5%	0% to 37%
All corrective measures but no refrigerant charge adjustment	8.1%	0%

Source: Contractors' 2012 CoolSaver pre- and post-tune-up measurements.

The Team used the evaluation findings efficiency loss values in Table 103 to estimate savings using the standard TRM 3.0 algorithms:

$$EER^{84}{}_{before} = (1 - eff\ loss) \times EER_{after}$$

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$$\Delta kWh = rating\ of\ unit\ (tons) \times EFLH_{cooling} \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}}\right)$$

$$\Delta kW = rating\ of\ unit\ (tons) \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}}\right) \times CF$$

$$\Delta kWh = rating\ of\ unit\ (tons) \times \left[EFLH_{cooling} \times \left(\frac{12}{EER_{before}} - \frac{12}{EER_{after}}\right) + EFLH_{heating} \times \left(\frac{12}{HSPF_{before}} - \frac{12}{HSPF_{after}}\right)\right]$$

Where:

$$HSPF = 0.3342 \times EER + 3.9871$$

In addition to residential and commercial HVAC tune-ups, EAI provided CoolSaver Program incentives for two new high-efficiency residential heat pump equipment installations. The Evaluation Team used the TRM methodology in the equation above with the nameplate rated efficiency and capacity of these systems and the federal minimum efficiency estimates of 13 SEER and 7.7 HSPF to calculate savings from these measures.

Extrapolation to Program Population and Uncertainty

The Evaluation Team performed a census review of reported post-EER estimates, so we did not need to extrapolate gross impacts to the entire measure population. We designed the participant survey sample (described in the Net-to-Gross Analysis section) to achieve ±10% precision at the 90% confidence level. The survey data resulted in a savings-weighted NTG estimate of 1.03 for residential tune-ups and 1.02 for commercial tune-ups. The Team applied these NTG estimates to the total *ex post* verified residential and commercial energy and demand savings.

Sampling Plan

The Evaluation Team performed a census review of reported post-tune-up EER measurements, then applied the TRM algorithms described above to develop gross energy and demand savings impacts. To estimate net impacts, the Team surveyed 70 residential participants (representing 82 of 5,445 residential tune-ups) and 60 commercial tune-up customers (representing 594 of 3,304 commercial tune-ups.[85]

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[84] To estimate HSPF before, replace EER in this algorithm with HSPF.

[85] Most commercial participants had more than one tune-up performed because they have multiple HVAC systems. Ten surveyed residential participants had two tune-ups, and one had three.

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Net-to-Gross Analysis

The Evaluation Team used the analysis approach outlined in the Evaluation Methodology section of this report to calculate distinct freeridership rates for residential and commercial CoolSaver Program participants. Details specific to the CoolSaver Program are outlined below.

CoolSaver Participant Freeridership

We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had pre-existing plans to purchase the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without the program they would have purchased the measure within a year.

Table 104 shows the survey questions we used to assess freeridership for each criterion. The Evaluation Team used the three freeridership criteria scores to determine overall program freeridership.

Table 104. CoolSaver Program Participant Freeridership Category Questions

Freeridership Criteria	Survey Question
Prior Plans for Measure Installation	Did you decide to purchase a high-efficiency tune-up before or after you first learned about the Entergy discount?
	Before you knew about the discount, were you already planning to have a tune-up performed?
Available Budget	If the discount had not been available, could your budget have accommodated the full cost of the high-efficiency tune up?
Stated Intent	Without the discount, would you have had a tune-up of the same quality, higher quality, or lower quality?
	Without the discount, would you have had the tune-up performed within one year?

The Team identified respondents as freeriders if they simultaneously met all three criteria. Examining freeridership by market segment reveals that four of 70 residential participants (6%) were freeriders; none of the commercial participants were freeriders (Table 105).

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Table 105. CoolSaver Unweighted Participant Freeridership Rate

Freeridership Criteria	Residential Participants (n=70)	Commercial Participants (n=60)
Prior Plans for Measure Installation	59% (41)	37% (22)
Available Budget	47% (33)	28% (17)
Stated Intent	7% (5)	0% (0)
Unweighted Freeridership Rate	6% (4)	0% (0)

To account for the different savings values associated with each respondent, the Evaluation Team weighted the freeridership results by the program savings to estimate the final freeridership rate. The gross savings associated with residential and commercial tune-ups in the program tracking database summed to 92,574 kWh and 829,715 kWh, respectively. To estimate net savings, the Team adjusted savings for each measure by its freeridership rating: if a tune-up was identified as a freerider measure, then we changed the savings associated with that tune-up were changed to 0 kWh.

For residential participants, the net savings summed to 89,574 kWh, with freeridership accounting for the remaining 2,677 kWh of the 92,574 kWh of gross savings. The ratio of the sum of freeridership to gross savings results in a weighted freeridership rate of 3%. Among commercial participants, there were no freeriders, so freeridership is 0% and net savings is equal to gross savings. Table 106 provides additional details regarding the weighted freeridership estimate.

Table 106. CoolSaver Program Weighted Freeridership Rate (kWh)

Stratum	Residential Participants			Commercial Participants		
	Count	Gross Savings	Net Savings	Count	Gross Savings	Net Savings
Non-Freerider	66	89,574	89,574	60	829,715	829,715
Freerider	4	2,677	0	0	0	0
Total	70	92,251	89,574	60	829,715	829,715
Weighted Freeridership	3%			0%		

CoolSaver Program Participant Spillover

The Evaluation Team also asked participants about spillover-eligible measures. The Team quantified like-spillover, which is equipment installed outside of the program that is exactly the same type and efficiency as the equipment installed through EAI programs, where the participants experience with the program was important to their decision to implement the measures.

Twenty program participants reported performing or installing EAI like-spillover measures, the most common of which included CFL and LED bulbs, ceiling insulation, and faucet aerators.

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In addition, five respondents installed or performed five non-program-like measures for which they did not receive rebates, and said that the program was important in their decision to do so. These measures were: energy-efficient water heater, programmable thermostats, and energy-efficient clothes dryer.

Based on program tracking data, the Evaluation Team estimated 19,281 kWh in energy savings for the 30 identified spillover measures. The spillover savings estimates for residential and commercial participants are 5,136 kWh and 14,144.6 kWh, respectively. The resulting spillover rate estimate is 6% of gross savings for residential participants and 2% for commercial participants (Table 107).

Table 107. CoolSaver Participant Spillover Savings (kWh)

	Residential Participants (n=70)			Commercial Participants (n=60)		
	Number of Measures	Savings per Measure	Spillover Savings	Number of Measures	Savings per Measure	Spillover Savings
Recycled refrigerator or freezer	2	760	1,520	0	0	0
Purchased CFLs	1	25	25	0	0	0
Purchased LEDs	3	29	87	5	87	435
Purchased efficient refrigerator	2	128	256	2	257	513.2
Installed a low-flow showerhead	0	0	0	1	261	261.2
Installed ceiling insulation	2	1,607	3,214	3	3,214	9642.6
Installed faucet aerators	1	33	33	4	33	132
Performed duct sealing	0	0	0	1	1,972	1971.9
Performed air sealing	0	0	0	1	429	428.7
Total Spillover Savings (kWh)	11		5,136	17		14,144.6
Total Gross Savings (kWh)	92,254			829,715		
Spillover Rate	6%			2%		

CoolSaver Net-to-Gross

Table 108 presents the NTG ratios for CoolSaver customers.

Table 108. CoolSaver Program Customer NTG Ratio Values

Parameter	Residential Participants	Commercial Participants
Weighted Freeridership Rate	0.03	0.00
Spillover	0.06	0.02
Net-to-Gross Ratio *(1 - Adjusted Freeridership + Spillover)*	1.03	1.02

CoolSaver Evaluated Net Savings

The final *ex post* gross and net energy savings and demand reductions for tune-up measures are shown in Table 109 and the program realization rates are shown in Table 110. These savings are estimated at the point-of-use and thus *do not include line losses*.

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Table 109. CoolSaver Program Evaluated Net Energy Savings

Measure	Evaluated Gross Energy Savings (kWh)	Evaluated Net Energy Savings (kWh)	Net-to-Gross Ratio
Commercial Tune-Ups	4,674,506	4,767,996	1.02
Residential Tune-Ups	6,451,941	6,645,499	1.03
Residential Heat Pump Replacement*	6,910	7,048	1.02
Total Energy Savings	11,133,356	11,420,543	1.03

* The Team did not evaluate freeridership for this measure, but applied the more conservative NTG ratio.

Table 110. CoolSaver Program Evaluated Net Peak Coincident Demand Reduction*

Measure	Evaluated Gross Demand Reduction (kW)	Evaluated Net Demand Reduction (kW)	Net-to-Gross Ratio
Commercial Tune-Ups	2,300	2,346	1.02
Residential Tune Ups	2,257	2,325	1.03
Residential Heat Pump Replacement**	1	1	1.02
Total Demand Reduction	4,559	4,673	1.02

* Individual gross kW savings are presented net of line loss.

** The Team did not evaluate freeridership for this measure, but applied the more conservative NTG ratio.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by supporting findings gathered during the evaluation.

Program Performance

EAI's program planning assumptions under-estimate measure savings

EAI developed energy-savings goals in 2011 that were based on a deemed value of 412 kWh per measure, as estimated by Frontier Associates. This value was a weighted average of savings for various measures including residential and commercial air conditioner tune-ups and commercial HVAC replacements. The savings estimate did not account for the large proportion of heat pumps the program served, which produce greater per-unit savings than air conditioners. Additionally, the deemed savings value was based on the assumption that a tune-up improves HVAC unit efficiency by 5%. The evaluation revealed tune-up savings higher than 5%. The program also realized greater demand savings per unit than expected.

Table 111 provides a summary of the types of program units in 2013 with energy savings by unit type for both residential and commercial sectors. These values compare to EAI's planning estimates, which assumed less than 500 kWh savings per unit in both 2012 and 2013.

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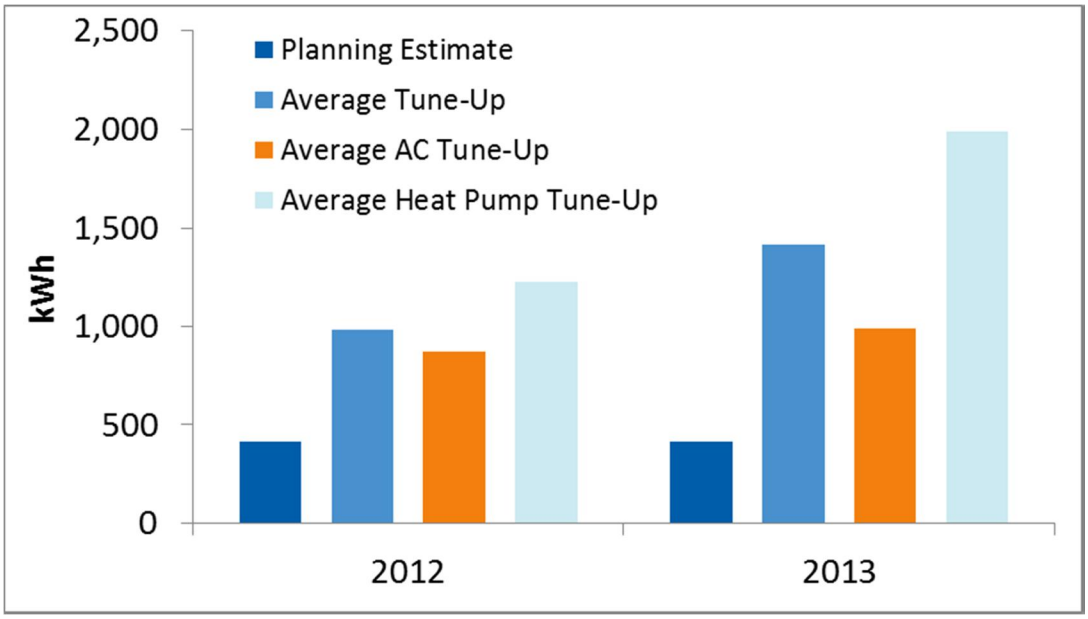
Table 111. Summary of 2013 Residential and Commercial Air Conditioner and Heat Pump Tune-Ups

Measure	Total Number Air Conditioners	Gross kWh Savings per Air Conditioner	Total Number Heat Pumps	Gross kWh Savings per Heat Pump
Commercial Tune-Ups	2,781	1,193	523	2,593
Residential Tune-Ups	3,182	757	2,263	1,787
Total	5,963	960	2,786	1,938

Figure 51 compares average per-unit net savings from an average CoolSaver tune-up to EAI's planning estimate for 2012 and 2013. This figure also shows average heat pump and average air conditioner savings separately for each year. The average evaluated savings per tune-up increased from 2012 to 2013 because the Team used the TRM methodology for our evaluation in 2012, while in 2013, we investigated concerns about the applicability of the TRM methodology and ultimately used an alternative savings calculation method, described in detail above. However, regardless of what method we used to evaluate the program, per unit savings were significantly higher than the assumptions EAI used to develop its program targets.

Figure 51. Net Savings Comparison by Unit Type



Program Design

The current program design, which requires only post-EER measurements, benefits contractors but increases the uncertainty of savings estimates.

In the 2013 CoolSaver Program, EAI eliminated the requirement that tune-up contractors perform pre-treatment EER measurements, instead relying on a large database of pre-tune-up conditions captured during previous years. This change to the program design was a significant benefit to contractors,

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reducing their data reporting requirements and allowing them to perform tune-up maintenance when conditions were not necessarily favorable for testing.

The Team found differences in tune-up work performed in 2012 versus in 2013, namely, a larger proportion of 2012 units required refrigerant charge adjustment. After evaluating all available qualitative data, the Team found no rational explanation for the difference in services performed between years (see the Engineering Savings Analysis section). Additional qualitative data and continued M&V (of pre- and post-EER measurements) on a sample of HVAC units would improve the Evaluation Team's ability to correlate unit condition with efficiency improvement and to confidently apply savings estimates from tune-ups performed in one year to those performed in the next.

Equipment replacement continues to be a non-performing element of CoolSaver.

There were two replacement heat pumps and no replacement air conditioners installed during 2013 (neither measure was installed during 2012). The decision to eliminate the $300 commissioning rebate in 2013 may have contributed to the measures' poor uptake, although the $300 installation rebate remains in place. However, even when both the commissioning and installation rebates were in place, the measure had very low uptake.

While program staff reported that they promote the replacement option, the program materials barely mention it. Because the overall program is meeting its targets, we agree with EAI that it would not be cost-effective to place a higher promotional effort on the replacement incentive.

The current amount of the bonus rebate may be limiting contractors' pursuit of dual-circuit systems.

Residential units, which generally range between 2 and 3 tons, make up the majority of program tune-ups, but larger systems, those up to and beyond 5 tons, produce greater savings for the same program cost. Tune ups on dual-circuit systems (considered anything above five tons) result in double the savings of a residential system, but qualify for an incentive of just $25 more.

In 2013, program staff reduced the bonus incentive for dual-circuit systems from $75 to $25. CLEAResult staff speculated that the program might have attracted more customers with large systems if it had retained the $75 rebate. However, program staff reported that EAI reduced the incentive to $25 to be more consistent with incentives offered by similar programs around the country.

In 2013, trade allies performed 316 tune-ups on dual-circuit systems, which is just under 10% of all commercial jobs. This was substantially higher than in 2012, when dual-circuit systems made up only 3% of the total. However, the average tonnage during 2013 was still relatively low, at 2.98 tons (Table 112).

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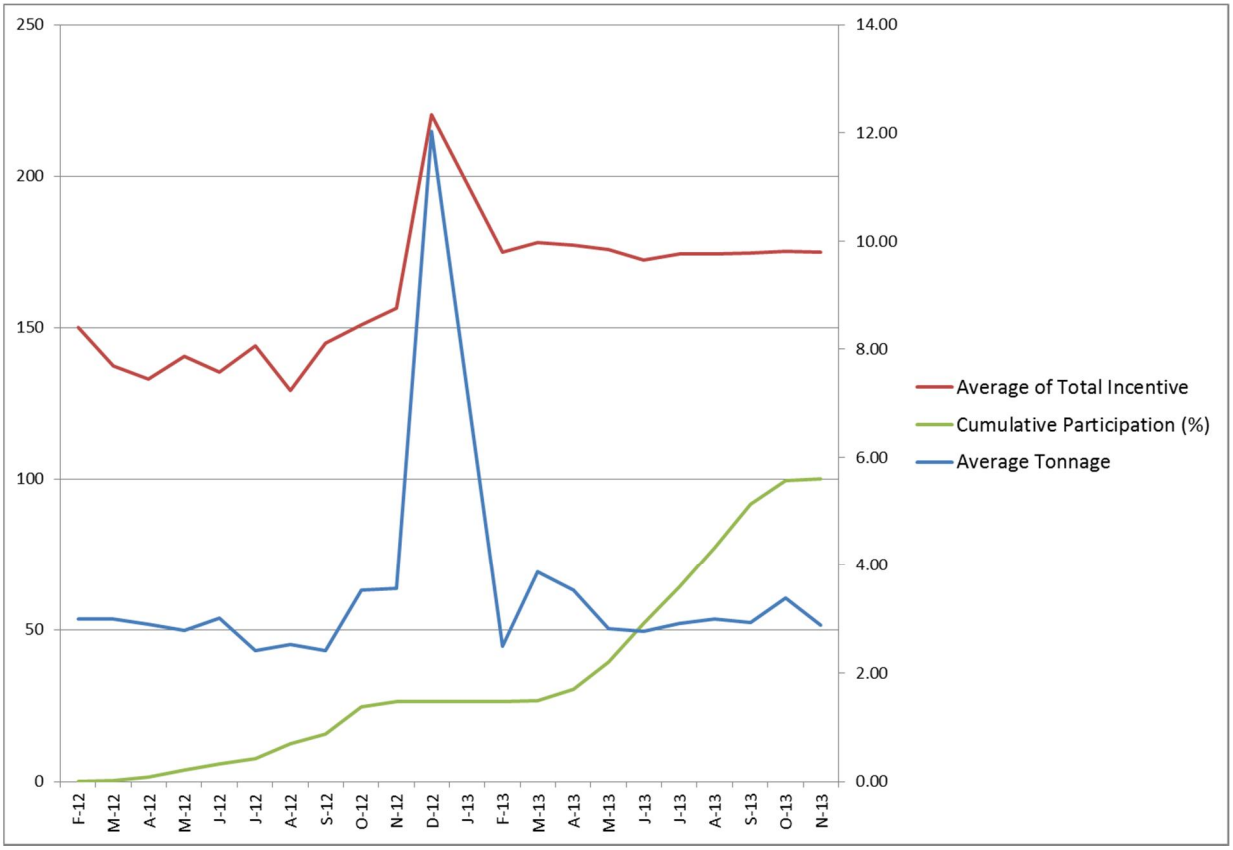
Table 112. Average Tonnage of Serviced Equipment in 2013

Measure	Average Tonnage
Commercial CAC (Tune-Up)	4.16
Commercial Heat Pump (Tune-Up)	3.69
Residential CAC (Tune-Up)	2.32
Residential Heat Pump (Tune-Up)	2.29
Total	2.98

Source: Evaluation Team analysis of ArchEE Database, CoolSaver Program, 2013 data.

EAI did not introduce the $75 bonus incentive for dual-circuit systems until late in the 2012 cooling season, and reduced it to $25 before the start of the 2013 cooling season. The Evaluation Team assessed the participation rates for dual-circuit systems during each month the $75 incentive was in place to better understand its effect on participation. Figure 52 shows the average incentive compared to average system tonnage during the 2012 and 2013 cooling seasons.

Figure 52. CoolSaver Average Incentive vs. Average Tune Up Size, 2012 and 2013



As Figure 52 shows, the CoolSaver program experienced a spike in the average system size of participating tune-ups' corresponding with the spike in average incentive value, which we assume represents the short period during which the higher $75 bonus incentive was in place. Thus, the larger incentive appears to have had the effect of increasing larger system tune-ups. However, given that the

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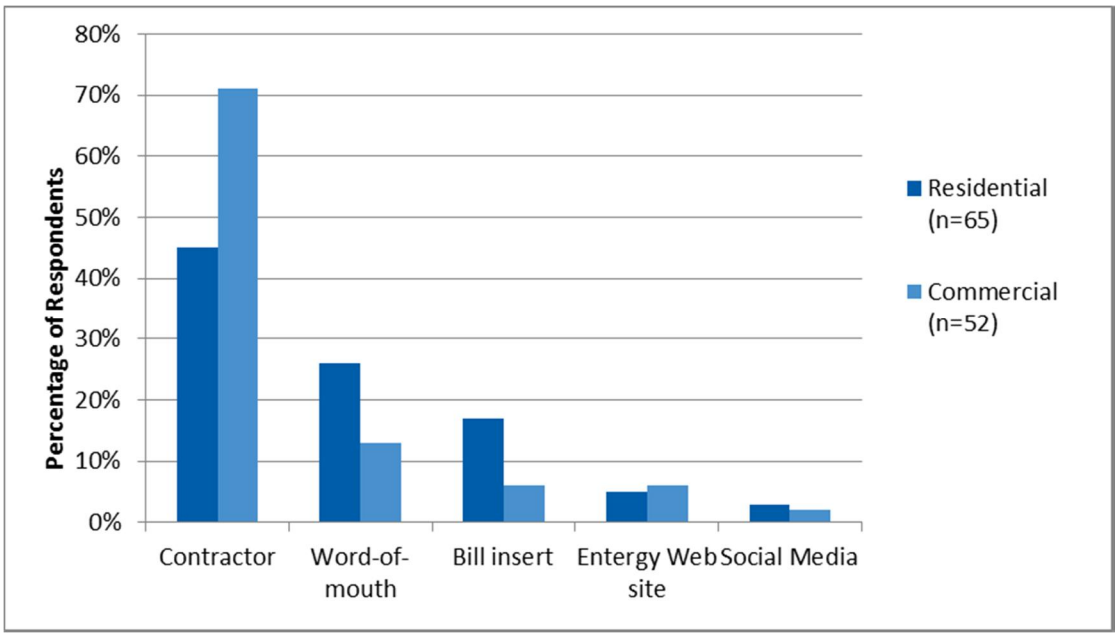
CoolSaver Program is cost effective and easily achieved its 2013 savings targets, it may not be necessary to attract these larger systems to the program.

Marketing and Outreach

Contractors were vital in informing both residential and commercial customers about the program.

The customer surveys revealed that 71% of commercial customers and 45% of residential customers found their contractors to be the best source of information about the program (Figure 53). Residential customers said the next most helpful source was word-of-mouth (26%), such as hearing from a friend, family member, or colleague; compared to only 13% of commercial customers who found word-of-mouth to be helpful.

Figure 53. Most Helpful Source for Program Information



QB6. Of all the information sources you may have used, which was the *most* helpful for understanding how to participate in the program?

While CLEAResult targeted facility owners in 2013, residential customers continued to drive the program.

CLEAResult said the unofficial program goal was to have 50% residential and 50% commercial participation. Commercial customers generally achieve higher savings than residential customers, but were the minority of 2012 participants. CLEAResult reported that therefore, they focused most of their 2013 direct marketing activities on driving commercial leads to trade allies. They also reported that many contractors have told them they deliberately target businesses, and primarily businesses they expect own their facilities, such as schools and apartment buildings. Customer surveys supported this, showing that 93% of commercial participants were building owners (56 of 60).

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As most small businesses lease property, this marketing approach may fail to reach large numbers of potential small business participants. Given the program success, allocating resources to these harder-to-reach customers does not need to be a priority for CoolSaver at this time. However, if EAI increases the program goals in the future, these customers may be worth actively pursuing.

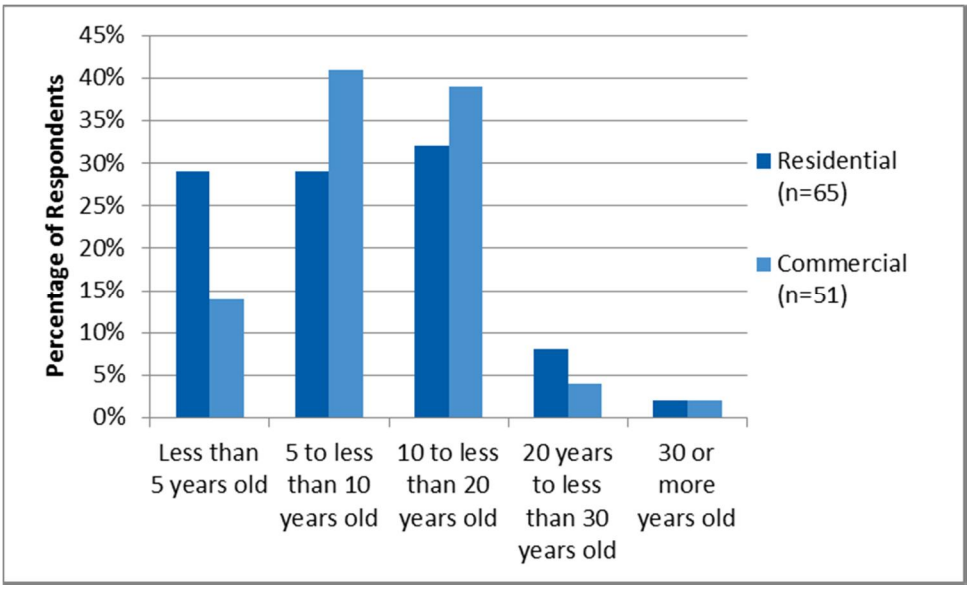
CLEAResult reported that many contractors expected these particular commercial targets to offer more than a single tune-up opportunity, as they are generally space-intensive and may allow contractors to maximize the number of tune-ups accomplished with each sale. However, despite the informal goal and the targeted commercial marketing, the year-end data shows that residential properties were 62% of total participation in 2013, up from 59% in 2012.

Customers are primarily motivated to improve working units to save money or energy, rather than by a need to a repair failed or failing equipment.

The Evaluation Team asked survey respondents what motivated them to participate: 39% of respondents wanted a more efficient unit in order to save *money* (50 of 128), and 30% wanted a more efficient unit in order to save *energy* (38 of 128). Nineteen percent reported that their system was not functioning well or efficiently, but no customers said their unit was not working.

Surveys also revealed that tuned-up equipment was not necessarily very old. While older equipment was still more common in the program, contractors performed 29% of residential tune ups (19 of 65) and 14% of commercial tune ups (seven of 51) on equipment less than five years old (Figure 54). In addition, 17 of 19 residential customers and four of seven commercial customers who responded said that their equipment was in good condition when they had it serviced.

Figure 54. Equipment Age at Time of Tune Up



QE1. About how old was the [MEASURE] you had serviced?

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Trade Ally Response

CLEAResult successfully increased the program trade ally network.

At the end of the 2012 season, the program implementer shifted outreach activities to focus more on supporting trade allies. In 2013, CLEAResult staff initiated face-to-face meetings with trade allies, created a Welcome Packet, and incorporated more sales content into the technician training. The Welcome Packet contains information on the program process, as well as examples of all the available marketing materials, which number over a dozen, by market segment. In addition, CLEAResult staff trained 220 technicians in over 104 companies during 2013. Because all participating trade allies must take a refresher course once a year, some of these contractors had also taken the class in 2012, but at least 60 companies were new in 2013.

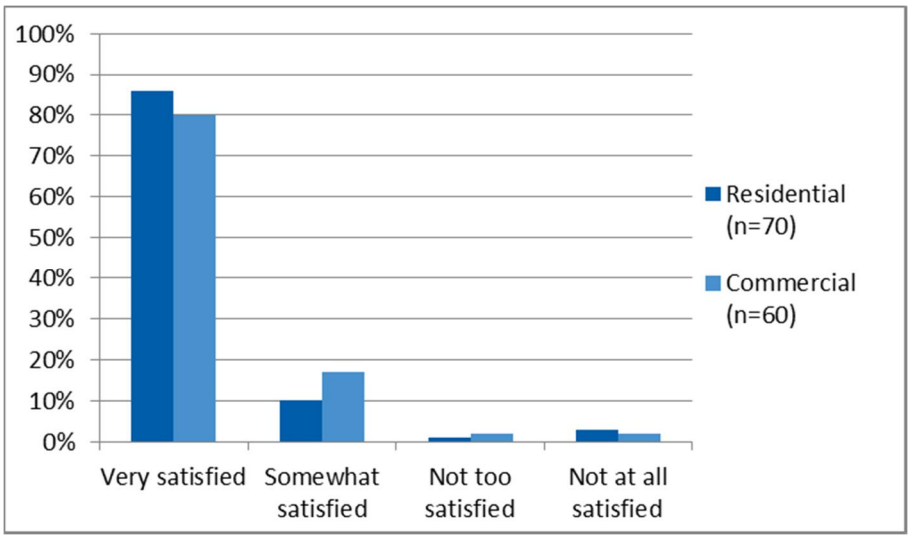
In 2012, CLEAResult and EAI both reported that the program needed to be focused on trade ally recruitment in order to increase overall participation. In 2013, two factors increased participation. One was an increased number of active trade allies. In 2012, the program had 39 active trade allies over the course of the year. In 2013, the program had 77 active trade allies over the year. The second factor increasing participation was that those contractors were also more active. The average number of tune-ups per contractor in 2012 was 80. In 2013, that number increased to 113. Based on this evidence, the increase in trade ally participation drove greater program participation.

Customer Satisfaction

Customers were very satisfied with the program.

Ninety-six percent of customers (125 of 130) were either very satisfied of somewhat satisfied with their tune-up (Figure 55). In addition, 98% (127 of 130) were either very satisfied or somewhat satisfied with the program overall (Figure 56).

Figure 55. Satisfaction With Tune-up



QD1. Would you say you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with your tune-up?

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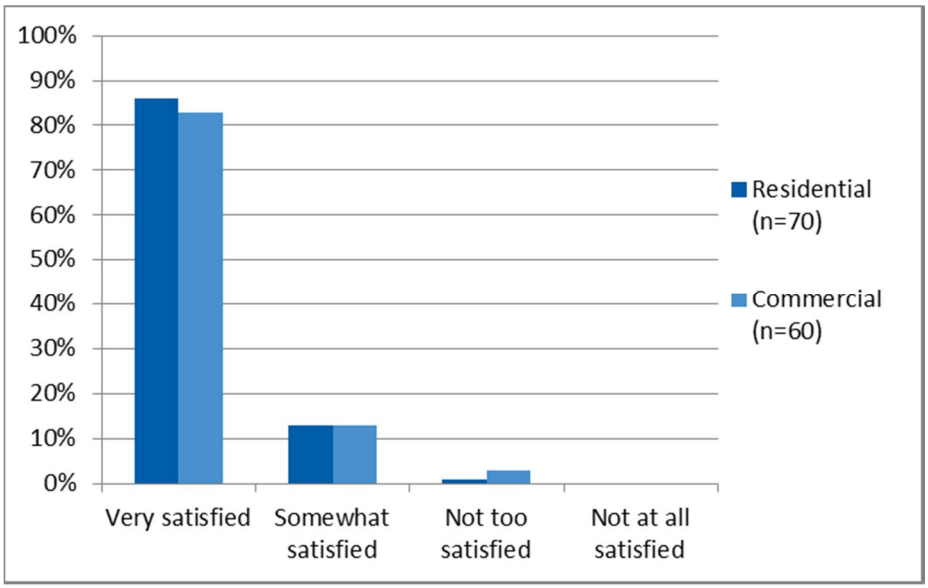
Figure 56. Satisfaction With Program Overall



QD4. Thinking about all aspects of Entergy's CoolSaver AC Tune-Up, were you very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with the program overall?

Program Materials

Although CLEAResult revised the program materials in 2013, the materials could be further improved.

Implementation staff made significant improvements to the program materials in 2013. They streamlined messaging to focus on key participation drivers including free or low-cost tune ups, saving energy, and saving money.

However, the materials direct customers to multiple contact points. The website has not being entirely revised and still promotes the $300 commissioning rebate, which EAI discontinued. In addition, the materials either have limited use of color and graphics, or are dense with text. According to the program implementer, one of the most popular materials was a fact sheet that mentioned the replacement option in text, but did not include it in the summary table of program incentives. The primary purpose of the fact sheet was to be a framework for a longer conversation with a potential customer, but in reality the fact sheet was not effective as a stand-alone marketing piece.

TRM

Depending on the measures performed, the efficiency loss values listed in TRM 3.0 may not accurately estimate savings from a CoolSaver tune-up. Furthermore, the EFLH values and savings algorithms are not accurate in some instances.

The Team found that the TRM 3.0 sources that provide efficiency loss values do not account for savings from tune-up measures, other than refrigerant charge adjustment. The Team conducted extensive independent research and analysis to determine how different equipment conditions and tune-up

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procedures may impact various parameter values that contribute to savings calculation. We determined that the TRM 3.0 algorithms for HVAC system tune-ups likely underestimate savings when tune-ups include measures beyond refrigerant charge adjustment. We also found that TRM-listed EER values (especially when low) overestimate savings when the TRM algorithms are no longer applicable.

Program Delivery

CoolSaver's rigorous protocols ensure contractors perform high quality tune ups that improve HVAC system efficiency.

The Evaluation Team conducted site visits to verify tune-ups and measure the performance of 31 residential 11 commercial HVAC systems. Only one commercial and one residential system we tested had incorrect refrigerant charge. All of the other systems operated as expected and appeared to be correctly tuned-up. These findings indicate that the CoolSaver Program contractors have a good understanding of the program's rigorous operating procedures and delivery requirements and appear committed to delivering high-quality tune-ups. The few issues we found indicate a need for continued M&V and contractor training to ensure their continued delivery of high-quality work.

Data Tracking and Reporting

The CoolSaver Program data tracking and reporting was adequate to calculate program savings with a high level of confidence.

The Team examined the 2012 and 2013 program tracking databases to assess instances of contractor measurement and/or data recording error, and found issues with approximately 10% of the measurements. However, these issues had an insignificant impact on our ability to accurately calculate program savings. We either adjusted or removed these values and the remaining sample was sufficient to perform robust impact analysis. Although the 2012 pre- and post-EER values and the 2013 post-EER values in the program tracking databases required adjustments to ensure program savings data were accurate and complete, these adjustments had a minimal impact on the final gross savings estimates.

Other than these minor inconsistencies, we found that the data tracking system is adequate and contains the inputs needed to estimate savings with either the TRM methodology or the modified methodology the Team used to calculate gross savings impacts. We found no evidence of bias in the energy-savings estimates; rather, the savings estimates were conservative relative to savings estimates from raw, unadjusted efficiency improvement values. We also found that EER estimates compared well with estimates from compressor mapping. The missing inputs, such as building type, were sparse and would not significantly affect savings estimates.

Evaluation Recommendations

Recommendations for the CoolSaver Program include the following:

Review the dual-circuit system incentive for the next program cycle.

This incentive has the potential to improve the cost-effectiveness of the program because it provides considerably more savings than smaller system tune ups for a small additional incentive. For the next program cycle, evaluate the impacts of a higher incentive for dual-circuit systems on the programs'

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savings potential and cost effectiveness and, if needed and desirable, consider increasing the incentive for dual-circuit systems to encourage contractors to focus on garnering the most savings at the least cost.

In the next program cycle, revise the participation targets to reflect actual savings per project and track participation by market segment.

The program has consistently achieved more savings per tune-up than EAI assumed in its planning assumptions. During planning for the 2015-2017 program cycle, EAI should revisit their savings and participation targets to better represent actual conditions in Arkansas. In addition, consider identifying separate goals for the residential and commercial markets. This will enable participation goals to serve as a management tool to help CLEAResult and other stakeholders understand how the program is performing against expectations.

Collect additional qualitative data and perform M&V in 2014.

To enable CoolSaver contractors to deliver the program as efficiently as possible, EAI does not require them to take pre-treatment EER measurements. However, in order to enable robust savings calculation and to understand the differences in HVAC systems tuned-up through the CoolSaver Program from year-to-year, the Evaluation Team requires additional qualitative data and M&V on a sample of projects. We recommend that CLEAResult require contractors to collect the following qualitative data:

> From a scale of 1-5 where 1= Very dirty (restricted airflow), 3=Medium dirty, 5=Clean (no airflow restriction)
>
> Condenser Condition Prior to Service: __ (List rating from 1-5)
> Cleaned? __ Yes __ No
> Fixed Bent fins? __ Yes __ No
>
> Evaporator Condition Prior to Service: __ (List rating from 1-5)
> Cleaned? __ Yes __ No
> Fixed Bent fins? __ Yes __ No
>
> Blower Assembly Condition Prior to Service: __ (List rating from 1-5)
> Cleaned? __ Yes __ No
> Fixed Bent fins? __ Yes __ No
>
> Air Filter Condition Prior to Service: __ (List rating from 1-5)
> Cleaned? __ Yes __ No
> Fixed Bent fins? __ Yes __ No
>
> Estimated remaining life of unit
> Select (1-15) ___ Years
> Recommended replace? __ Yes __ No

We further recommend that CLEAResult require contractors to perform pre- and post-M&V on 600 tune-ups randomly selected throughout the year. This represents approximately 7% of all tune-ups performed and will provide the Evaluation Team with a more robust dataset from which to derive

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program energy savings. To further support this recommendation, we plan to conduct ride-alongs with several contractors and will perform pre- and post-tune-up EER measurements on a sample of HVAC units.

Suggestions for Improvement

In addition to the recommendations above, the Evaluation Team identified the following tactical suggestion for the CoolSaver Program.

Revise all marketing materials based on developing messaging hierarchies for residential and commercial customers.

Consider developing a revised set of marketing materials that incorporate hierarchical messaging and differentiate between residential and commercial customers. In addition, ensure that all materials are up-to-date, including the website, and continue to refine the call-to-action so that each marketing piece reinforces a single "next step" that is most appropriate for the target audience.

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Small Business Program

Through the Small Business Program, EAI offers assistance and incentives for energy-efficiency projects implemented by commercial customers with peak demand under 100 kW. Participants receive incentives based on their project's projected annual electricity savings, at a rate of $0.21 to $0.50 per kWh of savings, capped at 25% to 75% of the project cost, depending on the measure types installed.

EAI also offers free direct installation of selected measures, including vending machine controllers and water-saving equipment, such as faucet aerators, for customers with electric hot water. Trade allies drive the program and conduct much of the program marketing. CLEAResult implements the program, and oversees trade ally recruitment and training, application and incentive payment processing, inspections before and after implementation, and direct measure installation.

Program Status Overview

As shown in Table 113, the Small Business program achieved more than triple its energy savings goal and double its demand reduction goal while spending just 95% of its planned budget. These energy and demand savings goals were exceeded despite the program not achieving its participation goal, indicating the program achieved substantially greater savings per project that EAI anticipated in its planning estimates.

Table 113. Small Business 2013 Participation and Net Savings Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	1,810	8,449	467%
Demand Savings (MW)*	0.61	1.61	266%
Participation (customers)	1,325	817	62%
Budget	$1,676,738	$1,590,045	95%

* The evaluated net MWh and MW values include a line loss adjustment factor of 1.0849.

Although the program design remained unchanged in 2013, the program implementer made several changes to support the program's progress. Implementation staff and utility staff reported several factors that contributed to the program's success in 2013:

- Hiring a trade ally coordinator, whose recruitment efforts let the addition of 52 new trade allies.
- Hiring a program coordinator to manage the flow of administrative processes.
- Increasing direct install efforts.

Status of 2012 Evaluation Recommendations

Table 114 lists the status of each of the Small Business Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed nearly all of the 2012 recommendations during the 2013 program year.

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Table 114. 2013 Status of 2012 Small Business Program Recommendations

2012 Recommendation	2013 Status
Consider further studying lighting operating hours and CFs to refine the TRM assumptions.	*In Progress/Partial.* The Evaluation Team conducted commercial light logging in 2012 and 2013 that allowed us to recommend HOU and CF updates to TRM parameter values for office buildings.
Calculate exit sign savings based on continuous operation, rather than by applying the operating assumptions for other lighting measures.	*Incomplete.* The implementer continued to apply AOH values of less than 8,760 to exit sign savings calculations in 2013.
Strengthen program messaging with an emphasis on how the program can help customers address challenges through incentives and free technical assistance.	*Completed.* Implementation staff developed a trifold brochure and case studies that emphasize how the program can help customers.
Emphasize direct contact from trade allies and utility or implementation staff as an effective technique to engage customers in the program.	*Completed.* The full-time trade ally coordinator conducted regular training sessions and developed a newsletter that provides contractors with technical assistance and program information to help them engage customers in the program.
Publish case studies to promote success stories and participation benefits.	*Completed.* Implementation staff published several case studies on the website and in hard copy.
Avoid using terminology or industry jargon that customers may be unfamiliar with in program materials.	*In Progress/Partial.* The implementation staff are developing new material with customer-friendly messaging.
Enhance the program website with success stories, quotations, images, and a stronger call-to-action.	*Completed.* Implementation staff overhauled the program website, adding quick links, upgraded visuals, quotes from participants, and a list of participating contractors.
Develop a metrics plan to provide consistent reporting and real-time tracking to allow for appropriate adjustments to program marketing. Align marketing activities, strategies, and metrics with the program goals and create a metrics framework to monitor performance.	*Completed.* Implementation staff created a marketing plan for all commercial programs, which includes marketing strategies, tactics, and tracking protocols..
Recruit and engage additional contractors with specialties beyond lighting.	*In Progress/Partial.* The trade ally coordinator is recruiting contractors from all industry specialties.
Ensure that program staff are well trained in whole-building energy system evaluations and that they conduct a full audit at each participating facility to identify all project opportunities.	*Completed.* Program implementation staff reported working to connect trade allies with one another. Staff also identified and made recommendations on other measures during pre/post inspections based on verifying measures against the direct installation checklists.
Identify decision makers in advance and schedule audit visits when a decision maker will be available at the customer site.	*Completed.* Program staff reported that trade allies attempted to work with the decision maker on the front end.

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2012 Recommendation	2013 Status
Follow up with small business customers who do not install recommended measures after six and 12 months to remind them of their identified energy-saving opportunities.	*Completed.* CLEAResult implemented a monthly follow-up process for customers and trade allies, and conducted a web-based survey to gather data on barriers customers face.
Promote additional energy-efficiency opportunities to customers who take advantage of direct install measures to build on their initial acceptance of the free program offerings.	*Completed.* Implementation staff identified additional measures through the direct installation checklists that accompanied each project. Also, the installers communicated other opportunities with the customer during direct installations.
Consider developing a tiered sampling plan for final on-site inspections. An example of such a plan is to inspect all projects for trade allies who are new to the program, then after they successfully complete a certain number of projects, inspect a random sample of the projects completed by that trade ally. Reduce the number of inspections over time for contractors that receive continued good inspection results.	*Completed.* Implementation staff implemented a new QA/QC process: • For a trade ally's first five projects, CLEAResult works with the Small Business Program team to conduct pre-inspections and post-inspections • After a trade ally's first five projects are completed, the Small Business Program team accompanies 10% of pre-inspections (randomly selected) and all post-inspections
To effectively use program resources, consider limiting the duplication of effort by reducing the number of inspections utility staff attends. Reduce the percentage of post-inspection ride-along visits over time as the program implementer gains experience.	*Completed (Considered/Rejected).* Implementation staff invited utility staff to all post inspections and the program manager determined which inspections to attend. Although the implementer noted they would staff would like to work with utility staff to identify when post-installation invitations are not required the program manager preferred to attend as many post inspections as possible.
Ensure that all trade allies who participate in EAI's C&I programs are aware of the benefits and processes associated with Small Business Program participation.	*Completed.* Implementation staff kept trade allies up-to-date about the programs through the C&I Newsletter, Trade Ally Summits, and program staff communication. CLEAResult discussed its role at the 2013 trade ally training summit and reinforced the message through its trade ally coordinator.
Clarify CLEAResult's role to trade allies. Trade allies may be more comfortable sharing project information if they understand why CLEAResult needs those data and are aware of any confidentiality protections in place.	
Use periodic trade ally meetings as an opportunity to collect feedback and strengthen the relationship between CLEAResult and trade allies.	
Consider ways to recognize active trade allies.	*Completed.* Implementation staff recognized high-performing contractors in the C&I Newsletter.
Ensure that program staff and trade allies explain the program to customers up front. Then follow up with trade allies and customers after completing the facility assessment.	*Completed.* The trade ally coordinator worked closely with the trade allies to ensure they had appropriate materials to explain program benefits to customers. Implementation staff reported establishing a monthly follow-up process for both customers and trade allies.

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2012 Recommendation	2013 Status
Develop protocols to ensure that CLEAResult only installs faucet aerators where appropriate, and that each selected aerator provides sufficient flow for the intended applications. A reduced flow rate may not be appropriate for all applications.	*Completed.* The implementer reported developing faucet aerator protocols and assigning a direct install coordinator to ensure compliance. As part of this process, the implementer introduced a higher flow aerator option (1 gpm) and instituted a policy of not putting aerators on fill sinks.
Improve the Small Business Program Manual by correcting typos, defining all acronyms and abbreviations, and clarifying staff roles and preferred customer contacts.	*In Progress/Partial.* Program staff intend to update the program manual in 2014.

Analysis Methodology

For the Small Business Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[86]

- End of Year Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Participant Surveys (n=70)
- Nonparticipant Surveys (n=281)[87]
- Trade Ally Interviews (n=20)[88]
- Site Visits (n=17)
- Materials Review
- TRM Review
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

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86 The Evaluation Team conducted a condensed process evaluation of the Small Business Program.

87 The Evaluation Team developed a combined commercial nonparticipant survey, administered to 281 EAI customers, for C&I Prescriptive, C&I Custom, CitySmart, and AES programs. We separated results for agricultural-sector nonparticipants from the overall survey results.

88 Because EAI qualifies trade allies to work across all commercial programs, the Evaluation Team developed and administered a combined commercial trade ally interview guide for trade allies who work in the C&I Prescriptive, C&I Custom, CitySmart, and Small Business programs.

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Impacts Summary

The Evaluation Team conducted an impact analysis of the Small Business Program, which consisted of a gross savings evaluation, TRM savings review, on-site light metering, and NTG analysis.

The program surpassed its savings goals by wide margins, achieving 467% of its energy-savings goal and 266% of its demand-reduction goal, based on net *ex post* MWh savings. Table 115 and Table 116 present these findings. These numbers include an 8.49% adjustment to account for line loss.

Table 115. Small Business Program Net Energy Savings Goal and Evaluated Net Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
1,810	8,449	467%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 116. Small Business Program Demand Reduction Goal and Evaluated Net Demand Reduction

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction* (MW)	Percent of Demand Goal Achieved
0.606	1.615	266%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor.

Review of Program Tracking Data

The Team reviewed the program tracking data to ensure accurate data had been captured, analyzed, and reported. In general, the Team found no significant errors or concerns with the data: all records belonged in the 2013 time period, there were no duplicate records, and most necessary fields were populated. The Team found that the heating type for every building was recorded as "Electric AC with Gas Heat." This input impacted the IEF for lighting, and the Team expected more diversity for this input in the tracking database.

Site Visits

The Evaluation Team coordinated site visits with the other commercial programs to streamline costs and logistics. Of 38 commercial site visits in total, we visited 17 EAI small business sites.. Ultimately, the Team used data from 16 of the small business sites in our analysis.[89] Table 117 shows the types of buildings visited and the quantities of light meters installed across all commercial sites.

[89] Logger data from the multifamily housing site showed very low usage for high traffic areas. The Team assumed this data was inaccurate and did not use it in our analysis.

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Table 117. Site Visit Tracker

Building Type	Sites Visited		Meters Installed	
	Small Business	All Commercial (Including Small Business)	Small Business	All Commercial (Including Small Business)
Office	5	15	34	118
Retail: Excluding Malls & Strip Centers	7	10	41	53
Retail: Strip Shopping & Non-Enclosed Mall	4	5	20	24
Manufacturing	0	7	0	38
Multifamily Housing: Common Areas	1	1	2	2
Totals	17	38	97	235

As shown in Table 118, we conducted site visits at the small businesses that represent building types with the most lighting measures installed in the Small Business Program: office and retail buildings.

Table 118. Small Business Building Types by Total Quantity of Lighting Measures Installed

Building Type	Total Quantity of Lighting Measures	Total *Ex Ante* kWh Lighting Savings
Office	5,242	1,529,898
Retail: Excluding Malls & Strip Centers	2,855	786,321
Retail: Strip Shopping & Non-Enclosed Mall	3,035	731,178

The Team installed light meters at all of the sites we visited and recorded at least three weeks of data from each logger. Drawing from data aggregated across all the commercial sites visits, the Team calculated average usage values for the building types we visited, and applied updated AOH and CF to evaluated savings, as shown in Table 119.

Table 119. Evaluated Inputs Updated Using Logger Data

Building Type	Annual Operating Hours		Coincidence Factor	
	TRM	Evaluated	TRM	Evaluated
Office	3,737	3,227	0.77	0.50
Retail: Excluding Malls & Strip Centers	3,668	2,776	0.90	0.55
Retail: Strip Shopping & Non-Enclosed Mall	3,965	4,072	0.90	0.84

Evaluated Gross Savings Analysis and TRM Review

The Team reviewed the TRM 3.0 against the program data to calculate gross savings as detailed below.

Review of TRM Values

The Evaluation Team reviewed the Arkansas TRM 3.0 formulas and inputs to verify they were reasonable for the Small Business Program measures. We then used raw data provided by program staff to

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recalculate savings for each measure and to verify that the implementer had applied the TRM algorithms correctly.

Evaluated Gross Savings

The total evaluated gross savings for the Small Business Program was 7,571 MWh, with a demand reduction of 1,481 kW. The final claimed (*ex ante*) and evaluated (*ex post*) gross energy and demand savings estimates are shown in Table 120 and Table 121, respectively. These savings are estimated at the point-of-use and thus *do not include line losses*.

Table 120. Small Business Program *Ex Ante* and *Ex Post* Gross Energy Savings*

Measure Type	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
Vending Miser	220,844	220,844	100%
Faucet Aerator	1,962,457	1,962,457	100%
Pre-Rinse Spray Valve	285,628	285,628	100%
CFL	442,821	385,254	87%
HID	2,669	2,722	102%
LED	1,563,944	1,470,107	94%
Lighting Control	98,706	90,810	92%
Linear Fluorescent	2,632,916	2,369,625	90%
Modular CFL and Cold Cathode Fluorescent Lamp	66,024	62,062	94%
Anti-Sweat Heater Control	69,446	69,446	100%
ECM for HVAC	55,005	55,005	100%
ECM for Refrigeration	105,627	105,627	100%
Total Energy Savings	7,506,086	7,079,586	94.3%

* Gross energy savings for measures are presented excluding line losses.
Totals may not sum precisely due to rounding.

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Table 121. Small Business Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Savings*

Measure Type	*Ex Ante* Demand Reduction (kWh)	*Ex Post* Demand Reduction (kWh)	Realization Rate
Vending Miser	0.0	4.1	-
Faucet Aerator	596.5	596.5	100%
Pre-Rinse Spray Valve	36.0	36.0	100%
CFL	77.6	55.1	71%
HID	0.5	0.5	93%
LED	224.5	177.4	79%
Lighting Control	19.9	16.3	82%
Linear Fluorescent	574.5	436.7	76%
Modular CFL and Cold Cathode Fluorescent Lamp	6.9	4.9	70%
Anti-Sweat Heater Control	0.8	0.9	108%
ECM for HVAC	12.5	12.5	100%
ECM for Refrigeration	12.1	12.1	100%
Total Demand Reduction	1,562	1,353	86.6%

* Gross energy savings for measures are presented excluding line losses.
Totals may not sum precisely due to rounding.

Lighting

As described below, the Team adjusted the following inputs in the TRM 3.0 algorithms to calculate program savings:

- Exit sign operating hours and CFs
- CFL baseline wattages
- AOH and CF for building types that were metered

The Team calculated realization rates between 87% and 102% for lighting energy savings and between 70% and 108% for demand savings (see Table 120 and Table 121). We set the AOH for all exit signs at 8,760 to reflect operating 24 hours a day. In many cases this represented a large increase over the tracked HOU. For these same measures, the CFs in the TRM 3.0 were set to 1, which increased the demand reduction for many of the exit sign measures.

The Evaluation Team updated the baseline wattages for 100-watt and 75-watt incandescent general service lamps impacted by the EISA law to comply with the standard and TRM 3.0 (Vol. 2, Sec 3.6.3). This resulted in baselines of 72 watts for 100-watt equivalent general service bulbs and 53 watts for 75-watt equivalent general service bulbs sold after June 2013. This negatively impacted both energy and demand savings. Lastly, the Team applied updated HOU values for building types where light meters were installed. For the Office and Retail: Excluding Malls and Strip Centers building types, the evaluated AOH reduced energy savings. For the Retail: Strip Shopping and Non-Enclosed Mall building type, the evaluated AOH increased savings.

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Lighting Controls

The realization rate of less than 100% is due entirely to adjusting the AOH and CF for the lighting controls based on values calculated from metering.

Non-Lighting Measures

Most non-lighting measures received realization rates of 100% for both energy and demand savings (shown in Table 120 and Table 121). Anti-sweat heater controls received realization rates of 100% for energy and 108% for demand savings. Since this measure is not found in the TRM 3.0, the Team used deemed unit savings calculated by the implementer for the 2012 evaluation. Despite no claimed *ex ante* demand savings, the Team applied evaluated demand savings to vending misers, per the TRM 3.0 (Vol. 2, Sec 3.7.4).

Net-to-Gross Analysis

The Evaluation Team calculated two distinct freeridership rates for EAI Small Business participants and contractors, following the analysis approach outlined in the Methodology of this report. Details specific to the Small Business Program are outlined below.

Freeridership

As some customers installed more than one program measure, the Team assessed participant freeridership at the measure level rather than at the participant level. We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had pre-existing plans to purchase or install the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without the program they would have installed a program-eligible measure of the same (or higher) efficiency within a year.

Table 122Table 31 shows the survey questions we used to assess freeridership for each criterion. We then used the three freeridership criteria scores to determine overall program freeridership.

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Table 122. Small Business Program Participant Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans for Measure Installation	Before learning about the Entergy Small Business Program, was your organization already planning to purchase and install the measure in 2013?*
Available Budget	If the program incentive had not been available, how likely is it that your 2013 budget would have included the full cost of the measure?*
Stated Intent	Without the incentive, would you have purchased a measure that had the same level of efficiency, higher efficiency, or lower efficiency?
	Without the incentive, would you have purchased the measure....[sooner, at the same time, later in the same year, in one or two years, etc.]?

* The Team varied the question wording slightly depending on the number of measures installed by the participant.

The Evaluation Team asked 68 participants about 96 measures they installed through the program.[90] We identified measures as freerider measures if they simultaneously met all three criteria. Responses indicated that there were no freerider measures. Accordingly, the participant freeridership rate is estimated to be 0%, as shown in Table 123.

Table 123. Small Business Program Participant Freeridership Rate

Freeridership Criteria	Unweighted Percent of Measures that Met Criteria (n=96)*
Prior Plans for Measure Installation	8%
Available Budget	15%
Stated Intent	3%
Unadjusted, unweighted Freeridership Rate	0%

* 68 participants answered freeridership questions about 96 Small Business Program-incented measures.

Contractor Freeridership

The Evaluation Team interviewed eight trade allies to estimate the overall contractor freeridership rate for the EAI commercial programs.[91] As these contractors had worked across multiple EAI programs, it was not possible to determine freeridership on a program level.

We determined the contractor freeridership rate by examining each contractor's responses to a question that measured the program's influence on their installation of high-efficiency equipment and services. When respondents indicated that their sales of a particular program-supported measure would have been lower in the absence of the program, we asked them, "By what percentage do you estimate your number of jobs from the measure would be lower if the program had not been available?" We then

[90] We interviewed three additional respondents and asked about 40 additional measures; however, we could not confirm these measures in the program tracking database so did not include them in this analysis.

[91] The Team interviewed 16 EAI contractors, but only eight gave valid freeridership estimates.

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calculated the number of freerider jobs (jobs that would have happened in absence of the program) for each contractor by subtracting the reported percentage from 100% and multiplying the resulting percentage by the total number of jobs done by that contractor through EAI programs in the past year.

In total, the eight contractors reported installing or performing 163 program-supported jobs, 22 of which were freerider jobs. The resulting contractor freeridership rate, unweighted by the measure savings associated with the jobs, was 13%.

Adjusted Freeridership

The Evaluation Team had planned to apply the unweighted contractor freeridership rate to participants who reported that the contractor or equipment supplier was important in their decision to purchase and install program measures. However, as participants indicated that the contractor was not important in the decision to install any of the measures, we did not incorporate contractor freeridership into the freeridership rate for this program.

We determined contractor importance using participant survey questions about the importance of two program elements related to the contractor: 1) advice from the equipment supplier or contractor, and 2) the energy assessment report (Table 124). If respondents indicated that both of these factors were very important to their installation decisions, we considered their contractors/equipment suppliers to be important in their decision to purchase and install program measures.

Table 124. Small Business Program Participant Contractor Importance Questions

Survey Question Wording	Response Categories
In general, how important was advice from your equipment supplier or installation contractor in your decision to purchase the equipment that you installed through the program(s)?	Very Important Somewhat Important Not Very Important Not at all Important
In general, how important was the energy assessment done by your contractor or program staff in your decision to purchase the equipment you installed through the program(s)?	

Spillover

The Evaluation Team also quantified like-spillover, which is equipment installed outside of the program that is exactly the same type and efficiency as the equipment offered through EAI programs, and where the participant's experience with the program was important to their decision to implement the measures.

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The following criteria were required for a measure to be considered as spillover:

- The service or measure was offered in the program portfolio,
- The customer did not receive a rebate or incentive for the measure, and
- The customer's experience with the program was somewhat or very important in their decision to install the measure.[92]

Interior lighting was the only like-spillover measure. Four program participants reported purchasing or installing a program-eligible interior lighting measure. These participants indicated that they did not receive a rebate and that the program was important in their installation decision. One contractor reported installing three unrebated lighting controls and said that the program was important in that decision.

Based on program tracking data, the Evaluation Team estimated 73,784 kWh in energy savings for the seven like-spillover measures. The resulting spillover rate estimate is 10% of gross savings (Table 125).

Table 125. Small Business Program Participant Spillover Savings

Measures/Actions	Number of Measures	Savings per Measure (kWh)	Spillover Savings (kWh)
Interior Lighting	4	17,471	69,884
Lighting Controls	3	1,300	3,900
Total Spillover Savings	7		73,784
Total Gross Savings	735,042		
Spillover Rate	10%		

The analysis from participant surveys revealed that there was no spillover among non-like program measures.

Small Business Programs Net-to-Gross

Table 126 presents the NTG ratios for Small Business customers.

Table 126. Small Business Program Customer Net-to-Gross Ratio Values and Calculation

Parameter	Value
Freeridership Rate	0.00
Spillover	0.1
Net-to-Gross Ratio *(1 - Adjusted Freeridership + Spillover)*	1.1

[92] The Evaluation Team asked respondents to identify the extent to which the program influenced their non-program sales (contractors) and non-program purchases (participants) using a scale of very important, somewhat important, not very important, or not at all important.

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Evaluated Net Savings

The final evaluated net savings for the Small Business Program are shown in Table 127. Applying the 1.10 NTG ratio to *ex post* gross savings results in *ex post* net energy savings of 7,788 MWh and coincident peak demand reduction of 1,488 kW. The values shown are presented excluding line loss.

Table 127. Small Business Programs Evaluated Net Savings*

Savings	Evaluated Gross Savings	Net Savings	Net-to-Gross Ratio
Coincident Peak Demand Savings (kW)	1,353	1,488	1.1
Annual Energy Savings (MWh)	7,080	7,788	1.1

* Savings are presented excluding line losses.

Evaluation Findings and Conclusions

The following sections present evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Marketing and Outreach

Hiring a trade ally coordinator improved relationships with trade allies and enhanced recruiting efforts.

The implementer hired a new trade ally coordinator to work across all EAI commercial programs. According to implementation staff, the trade ally coordinator acts as an ombudsman, listening to the trade allies' concerns and advocating on their behalf to other program team members. Other duties include managing trade ally communications and outreach efforts, collecting trade ally feedback, and arranging training.

Program implementation staff attributed the program energy savings achievements in part to the enhanced trade ally outreach effort, saying, "a bigger trade ally network means more salespeople out on the street, selling the program."

Program Delivery and Implementation

Implementation staffing adjustments improved program support.

CLEAResult made several changes to program staffing in 2013. They hired a dedicated trade ally coordinator for all commercial programs, as described above, and hired a program coordinator in mid-2013 to manage project flow, including collecting data and invoices, following up with trade allies, and submitting applications for EIA approval. The implementer also increased the amount of staff time dedicated to direct install efforts by 40% to 50%.

Furthermore, the implementer hired an additional staff member for 2014. This new position is intended to be in the field full-time, carrying out inspections, direct installations, and sales functions. The addition of a field technician will allow the current engineering analyst to be dedicated to savings calculations, data entry, and project monitoring.

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Trade Ally Response

Trade allies were satisfied with the training CLEAResult provided.

Trade allies who attended webinar or in-person trainings expressed satisfaction with the training. All 15 trade allies said the training they attended prepared them to understand program steps and requirements, and to answer customer questions. In addition, two trade allies called attention to CLEAResult staff accessibility and responsiveness when they had questions.

Most trade allies did not identify potential training improvements. However, one trade ally suggested further training to facilitate networking opportunities across sectors, such as helping lighting vendors and HVAC contractors work together to sell comprehensive projects. In the Evaluation Team's experience, this suggestion frequently comes up in commercial program evaluations, and other utilities are making an effort to put such training and networking opportunities in place.

Program participation helped trade allies increase sales and improve customer satisfaction.

Trade allies reported that program participation helped them realize a variety of benefits. For example, trade allies said the program helped:

- "Open doors with customers and provide an added value."
- Shorten the payback and increase the return-on-investment (ROI) on lighting projects.
- "Expand our market in Arkansas."
- "Provide a more cost-effective way for customers to participate and save energy."

However, two of those interviewed noted that they had not received the leads they expected from the program, and said the price competition between network trade allies is fierce.

Despite the program's efficient administrative processes and incentive levels, trade allies experienced various challenges.

Trade allies noted that simple program paperwork, incentive processing, and incentive levels enabled them to move forward quickly once customers expressed interest in pursuing a project. The following trade ally verbatim responses indicate aspects of the program that worked well for them:

- "The training was great."
- "The [application] system in place is a good one."
- "CLEAResult processes data in a timely manner so that the customer sees the incentive estimate. It helps them move forward quickly."
- "It gives us an opportunity to have a warm introduction to customers" because customers are more receptive to the program offer than a cold call.
- "The rebate amounts are very good."

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However, while trade allies commended program efficiencies, they also identified some areas in which the program presented sales challenges. For example:

- "It's harder to give away free money…people think there is a catch."
- "The hardest part is actually getting a hold of the right person at Entergy…that probably took six to eight different phone calls."
- "The only challenge is the products we're allowed to offer. Sometimes our products aren't always available from our suppliers."

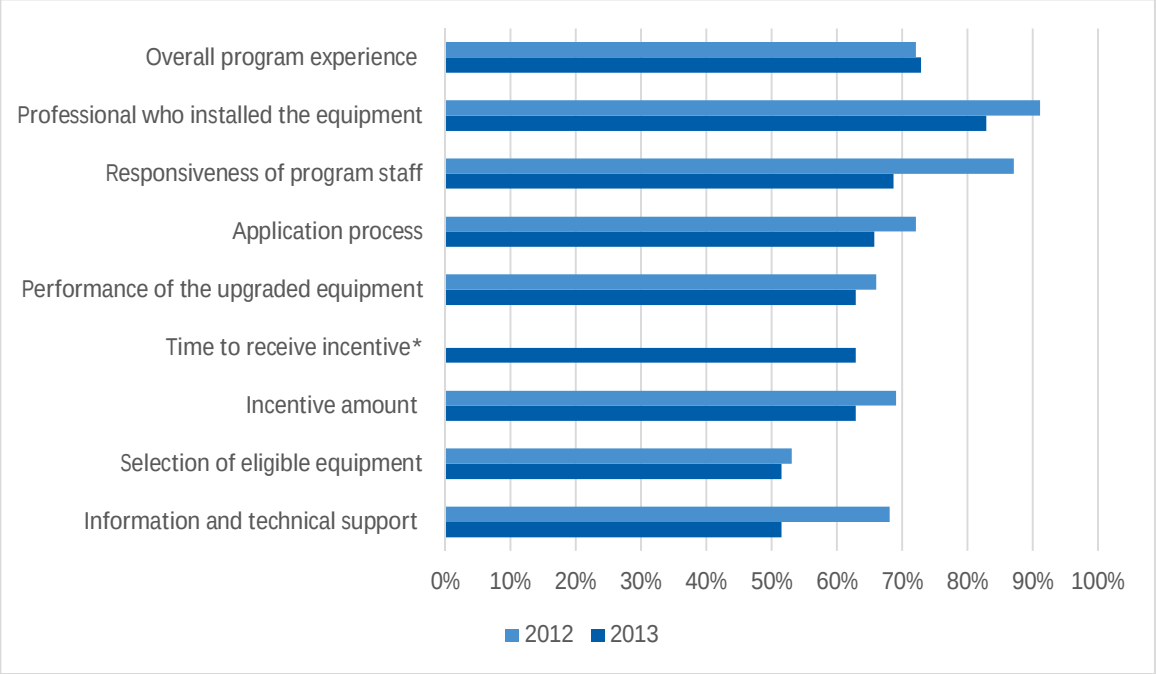
These trade ally challenges are consistent with those in other jurisdictions that offer programs for the small business sector.

Customer Satisfaction

Customers continued to be satisfied with the program in 2013.

Seventy-three percent of participating customers surveyed said they were "very satisfied" with the program overall in 2013, which is slightly up from 2012 (72%). Figure 57 shows the percentage of customers who said they were "very satisfied" with various aspects of the program in 2012 and 2013.

Figure 57. Customer Satisfaction Results



Q58-Q66. "How satisfied are you with…?" (n=46 in 2012, n=70 in 2013)
* This was a new survey question in 2013.

As shown in Figure 57 , customer satisfaction with the program overall and with specific program elements was generally similar from 2012 to 2013, with two exceptions: customer satisfaction with the program staff responsiveness and with program information and technical support declined by more

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than 15% between years. Customer satisfaction with the professional who installed their equipment also declined noticeably, although to a lesser extent.[93]

TRM

AOH and CF inputs for the office building type in the TRM 3.0 do not reflect conditions in Arkansas.

The Evaluations Team's light metering over two years revealed that the AOH and CF inputs included in the TRM 3.0 are not accurate for the office building type and should be updated. We discuss research and findings associated with TRM parameter values in greater detail in the Portfolio Conclusions and Recommendations section of this report.

Data Tracking and Reporting

Exit sign measures often receive incorrect inputs.

The Evaluation Team found that in many instances, the implementer had recorded savings inputs for exit signs that did not reflect continuous operation; the AOH was not 8,760 and the CF was not 1.0. Because exit signs generally operate 24 hours per day, 365 days per year, we assumed these tracking system inputs were applied incorrectly.

Evaluation Recommendations

The Evaluation Team identified recommendations relevant to the Small Business Program regarding updates to the TRM and tracking database in the Portfolio-Level Recommendations section of this report.

[93] The changes in response for: Information and technical support, Responsiveness of program staff, and Professional who installed the equipment are statistically significant.

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Commercial and Industrial Prescriptive Program

Through the C&I Prescriptive Program, EAI offers technical assistance and incentives to nonresidential customers for any measures with deemed savings in the Arkansas TRM 3.0. EAI provides program incentives based on projected annual electricity savings, at a rate of $0.09 per kWh of savings, capped at 75% of the project cost. Program participants also had the option to bundle prescriptive measures with custom measures to access the C&I Custom Program's tiered incentive structure.

EAI also offers free direct installation of selected measures including vending machine controllers and water-saving equipment, such as faucet aerators for customers with electric hot water. The program implementer, CLEAResult, recruits and trains trade allies, provides technical assistance to customers, processes applications, conducts inspections before and after implementation, installs direct installation measures, and makes incentive payments. The program is intended to be largely trade ally-driven. Trade allies conduct much of the outreach to customers and assist with identifying eligible projects.

Program Status Overview

In 2012, the C&I Prescriptive Program fell short of its energy and demand savings goals, achieving 55% of its 75,569 MWh energy goal and 37% of its 17.67 MW demand reduction target. The program also fell short of its 1,030 participant goal, with a total of 588 unique customers (57%) completed in 2013 (Table 128).[94]

Table 128. C&I Prescriptive 2013 Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	75,569	41,738	55%
Demand Savings (MW)*	17.67	6.47	37%
Participation (customers)	1,030	588	57%
Budget	$12,956,146	$9,388,423	72%

*MWh and MW actual represent evaluated net savings including a1.0849 line loss factor.

EAI calculated program goals based on a percentage of sales across the entire customer base. However, staff reported that the provision that allows large C&I customers to opt out of Arkansas energy-efficiency programs if they agree to implement a self-directed energy-efficiency plan impacted the program negatively. Staff reported that approximately 60 large accounts exited the program-eligible population in 2013. Further, program staff said some customers may have decided not to participate in programs so they can opt out in the future, after three years of nonparticipation. However, because EAI

[94] Many customers completed multiple projects at one site (as defined in the program tracking data). The Evaluation Team assessed that there were 588 participants by counting each unique project, which included multiple installations completed at the same site by the same contractor, as one project.

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must include these nonparticipants-by-choice in its sales total until they officially opt out, the program savings potential may be overestimated.

In addition, program staff reported that changes to the program incentive strategy may have diverted some participants from the C&I Prescriptive Program to the C&I Custom Program. This change is discussed in greater detail in the Program Design section below.

In 2013, EAI made only one change to the program, increasing the incentive from $0.09 per kWh to $0.15 per kWh in order to drive program participation. However, because of the synergies between the C&I Custom and C&I Prescriptive programs, program staff proposed and received approval from the APSC to combine the two programs in 2014. Under the new combined program structure, customers will be able to receive increased incentives for bundling prescriptive-only projects; in 2013, a project had to include at least one custom measure to qualify for the tiered incentive structure.

Status of 2012 Evaluation Recommendations

Table 129 lists the status of each of the C&I Prescriptive Program recommendations reported in the *2012 Energy-Efficiency Portfolio Evaluation Report*. Program staff completed nearly all of the 2012 recommendations during the 2013 program year.

Table 129. 2013 Status of 2012 C&I Prescriptive Program Recommendations

2012 Recommendation	2013 Status
Energy-efficiency programs have two primary levers to control participation: marketing and incentives. EAI should monitor these two factors as the program matures.	*Completed.* Program staff created a marketing plan with metrics to monitor marketing effectiveness. Program staff also monitored program participation relative to incentive levels, then proposed program changes based on the result (such as combining the C&I Prescriptive and C&I Custom programs).
Calculate exit sign savings based on continuous operation, rather than applying the operating assumptions for other lighting measures.	*Completed.* Program staff adjusted exit sign savings to assume continuous operation.
Finalize the work paper for anti-sweat heater controls in refrigerated cases.	*Completed.* Program staff completed the work paper in 2012, and the Evaluation Team accepted the methodology and savings in December 2012.
Consider offering prescriptive incentives with a pre-approved list of equipment and fixed incentive amounts. This would better distinguish the C&I Prescriptive and C&I Custom programs and provide a simplified process for customers. While projected energy savings would not be necessary to determine incentives, trade allies or implementation staff could still calculate savings estimates as a service to customers.	*In Progress/Partial.* Implementation staff are developing a Standard Offer lighting methodology, in which savings and incentive calculations are simplified using common retrofit types, TRM building data, and historical data. Staff will make TRM 3.0 adjustments prior to releasing this tool.

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2012 Recommendation	2013 Status
Consider increasing the program incentive levels to cover a larger share of project costs, in an effort to increase participation. Further analysis is required to determine appropriate incentive levels that will improve project finances and motivate higher customer participation while meeting program cost-effectiveness goals.	*Completed.* Program staff raised program incentives from $0.09 per kWh to $0.15 per kWh in 2013. Staff elevated incentives in the 2013 program year to target paying 50% of incremental project costs based on the 2012 project sample set.
Strengthen program messaging with an emphasis on how the program can help customers address challenges by leveraging incentives and free technical assistance.	*Completed*. Program staff revised the current marketing materials and are developing new materials that provide a holistic description of the C&I program with less technical jargon.
Evaluate options for offering on-bill financing to customers or more actively promoting financing available through the Arkansas Energy Office.	*Completed (Considered/Rejected)*. Program staff considered and declined to pursue on-bill financing or to promote the Arkansas Energy Office's financing, preferring to encourage participation from private-sector financing sources. Implementation staff added one trade ally that offers financing for its projects and is actively promoting the program to ESCOs.
Emphasize direct contact from trade allies and utility or implementation staff as an effective technique to engage customers in the program.	*Completed*. Implementation staff trained trade allies to use Energy Solutions-branded marketing materials, ad templates, program badges, etc. in their outreach efforts to drive more direct contact. Implementation staff account managers are working on outreach follow-up and direct contact marketing efforts.
Avoid using unfamiliar or inconsistent terminology in program materials.	*Completed*. Program staff revised the program materials in February 2013 to reduce technical jargon and confusing language.
Enhance the program website with success stories, quotations, images, and a stronger call-to-action. Consider creating an internal program messaging hierarchy document to provide consistency between materials and to prioritize the key messages for the target audience.	*In Progress/Partial.* Program staff updated the website to include customer testimonials and plan on adding case studies.
Develop a metrics plan to provide consistent reporting and real-time tracking, which can be used to adjust program marketing. Align marketing activities, strategies, and metrics with program goals and create a metrics framework to monitor performance.	*Completed*. Implementation staff use a customer resource management tool for outreach and project tracking. Staff also monitor the metrics on direct install and mailer outreach campaigns to determine success and adjust outreach tactics accordingly.
Continue to recruit and engage additional contractors with specialties beyond lighting.	*Completed*. Program staff assigned a program coordinator to lead trade ally interaction and recruitment. The implementer recruited additional trade allies that offer services beyond lighting.

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2012 Recommendation	2013 Status
Ensure that program staff are well trained in whole-building energy-system evaluations, that they conduct a full audit at each participating facility to identify all project opportunities, and that they fully explain the audit findings to the decision maker.	*Completed*. Program staff take part in a variety of internal training sessions, outside training sessions, and on-site training with senior personnel whenever possible. Program staff will continue to educate themselves on energy evaluations to meet these requirements.
If possible, schedule the audits to coincide with when a decision-maker will be available at the customer site.	*Completed*. Implementation staff focused on interacting with key decision makers on each project during 2013.
Promote other energy-efficiency opportunities to customers who take advantage of direct install measures to build on their initial acceptance of the free program offerings.	*Completed*. Implementation staff added a Direct Install Checklist that installers complete on-site. The checklist provides some indication of other opportunities that may be available. Implementation staff targeted direct install participants during 2013 to promote additional projects.
Follow up with program customers who do not install all of the recommended measures after six and 12 months to remind them of their identified energy-saving opportunities.	*Completed*. Program staff and the account manager used lists of enrollees that did not complete all measures as an integral part of their 2013 outreach efforts.
Consider developing a tiered sampling plan for final on-site inspections.	*Completed (Considered/Rejected).* EAI's internal auditing requirements do not allow for a tiered sampling plan for final on-site inspections.
Consider reducing the number of inspections that utility staff attend as the program implementer gains experience.	*Completed (Considered/Rejected)*. Implementation staff invite the utility program manager to all final on-site inspections. The program manager determines which inspections to attend on a case-by-case basis and prefers to attend as many inspections as possible.
Ensure that all trade allies signed on to participate in EAI's C&I programs are aware of the benefits and processes associated with participation in the C&I Prescriptive Program.	*Completed*. Implementation staff held trade ally meetings to educate existing trade allies and to introduce new trade allies to the program. A program coordinator is now dedicated to trade ally interaction, and holds meetings/trainings on an ongoing basis.
Have CLEAResult update their recommendations for customers to indicate that a trade ally may need to perform an additional facility review and could change the proposal. Consider ways to clarify that the program allows trade allies to recommend appropriate modifications to CLEAResult's proposals, such as by providing trade allies with program-branded proposal forms for their alternative recommendations.	*Completed.* Staff redesigned program collateral to include language (where appropriate) that illustrates the program process in simple terms, including that the customer should engage a contractor or program trade ally to review and install recommended upgrades.

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2012 Recommendation	2013 Status
Use periodic meetings with trade allies as an opportunity to collect their feedback and strengthen the relationship between CLEAResult and trade allies.	*Completed.* Implementation staff held trade ally meetings and the dedicated trade ally coordinator provided avenues for trade ally feedback on both personnel performance and project status.
Consider ways to recognize active trade allies, such as by publishing case studies on their successful projects.	*Completed.* Implementation staff created case studies to showcase program successes. Staff encourage trade allies to use these case studies in their marketing and outreach efforts, as well as to recommend projects to implementation staff where a case study would assist them in developing more work.
Clarify CLEAResult's role to trade allies. Trade allies may be more comfortable sharing project information if they understand why CLEAResult needs the information, and if they are aware of any confidentiality protections in place.	*Completed.* Implementation staff held trade ally meetings and trainings specifically to address their concerns. The trade ally coordinator will continue to develop relationships to overcome communication barriers.
Improve the *Prescriptive Program Manual* by correcting typos, defining all acronyms and abbreviations, and clarifying staff roles and preferred customer contacts.	*In Progress/Partial.* Program staff updated the program manual in January 2013. However, the manual does not clarify staff roles.

Analysis Methodology

For the C&I Prescriptive Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities:[95]

- Data Collection Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
  - Implementation Trade Ally Coordinator (n=1)
- End of Year Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Combined C&I Participant Surveys (n=85)[96]
- Combined C&I Nonparticipant Surveys (n=281)[97]

[95] The Evaluation Team conducted a full process evaluation of the C&I Prescriptive Program.

[96] The Evaluation Team developed a combined commercial participant survey with core survey questions and program-specific questions for the C&I Prescriptive, C&I Custom, CitySmart, and AES programs. Results are reported by program.

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- Commercial Trade Ally Interviews (n=20)[98]
- Materials Review
- Site Visits (n=22; 146 meters installed)
- Calculation of TRM-based Savings
- Desk Reviews (n=22)
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the C&I Prescriptive Program, which consisted of a gross savings evaluation, TRM savings review, on-site measure verification, and NTG analysis.

The program did not reach its savings goals of 75,569 MWh and 17,671 kW. Based on net *ex post* MW savings, EAI achieved 55% of the program energy-savings goal and 37% of the peak coincident demand-reduction goal. Table 130 and Table 131 present these findings. These numbers reflect an 8.49% adjustment from the point of savings to account for line losses and a NTG ratio of 0.99.

Table 130. C&I Prescriptive Program Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
75,569	41,738	55%

* The evaluated net energy savings include a 1.0849 line loss factor.

Table 131. C&I Prescriptive Program *Ex Post* Gross kW Savings, Actual and Goal

Demand Reduction Goal (kW)	Net Evaluated Demand Reduction* (kW)	Percent of Demand Goal Achieved
17,671	6,471	37%

* The evaluated demand reduction includes a 1.0849 line loss factor.

97 The Evaluation Team developed a combined commercial nonparticipant survey, administered to 281 EAI customers, for the C&I Prescriptive, C&I Custom, CitySmart, and AES programs. We separated the results for agricultural-sector nonparticipants from the overall survey results.

98 Because EAI qualifies trade allies to work across all commercial programs, the Evaluation Team developed and administered a combined commercial trade ally interview guide for trade allies who worked in the C&I Prescriptive, C&I Custom, CitySmart, and Small Business programs.

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Review of Program Tracking Data

The Evaluation Team reviewed the ArchEE database provided by EAI. We checked dates to be sure all data represented the 2013 program year, then verified that data needed to estimate TRM savings was present. We found several anomalies.

- Savings for exit signs used the deemed AOH and CF for the building type where they were installed, rather than the TRM 3.0-stipulated 8,760 hours and a CF of 1.0.
- Some lighting measures that specified 8,760 AOH did not also specify a CF of 1.0.
- The new construction lighting measure, which has complex savings calculations, was sometimes missing key data.

TRM Review

The Team verified that the TRM 3.0 formulas and inputs for measures implemented in the C&I Prescriptive Program were reasonable, particularly focusing on measures that were new to TRM 3.0, such as Computer Power Management (Vol. 2, Sec 3.7.3), and found the inputs and deemed savings to be reasonable.

We also inspected the differences between TRM Version 2.0 and TRM Version 3.0 to verify program compliance to the new TRM. TRM 3.0 (Vol. 2, Sec 3.7.3) uses different IEF values for air conditioned spaces than TRM 2.0. The IEF_D increased, while the IEF_E was expanded from one value of 1.05 to a range of values from 0.87 to 1.09, depending on the heating type used in the air conditioned space. This required the program implementer to record data that they may not have collected before TRM 3.0 was released in September 2013. The EAI ArchEE database exclusively lists the gas heating type, which is the option leading to the most savings.

A more significant change occurred for New Construction Lighting Efficiency (TRM 3.0, Vol. 2, Sec 3.6.3; and TRM 3.0, Vol. 3, Appendix F). TRM 3.0 is based on ASHRAE 90.1-2007 LPD Building Area Method and Space-by-Space Method, while TRM 2.0 was based on the ASHRAE 2001 standard. The LPDs in TRM 3.0 are lower for all building area types and space types. A project calculated using the higher TRM 2.0 LPD allowance would result in higher savings than a project calculated using the TRM 3.0 LPD value.

For both the implementer and the Evaluation Team, it is problematic to change TRM standards part-way through the year. The new construction lighting efficiency measure is complex to characterize in the database, a point we elaborate on below. However, to comply with the TRM 3.0 inputs, the implementer changed the database values for the IEFs, which appeared to have increased savings retroactively for all 2013 projects. Changing the LPD value for a complex new construction lighting project in the database is more difficult and would decrease savings, but results in more accurate results according to TRM 3.0. This appears to not have been done retroactively to 2013 projects that occurred earlier in the year. Thus, the Evaluation Team adjusted the LPD for all projects.

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Site Visits Lighting

Lighting measures represent the largest savings component in the program. The Evaluation Team conducted site visits for lighting projects drawn from across multiple programs. We focused on office, manufacturing, and multiple categories of retail building types (e.g., Retail: Excluding Malls & Strip Centers, Retail: Strip Shopping & Non-enclosed Mall) in our 2012 and 2013 evaluations. As shown in Table 132, the manufacturing and office building types represented the categories with the most savings.

Table 132. C&I Prescriptive *Ex Ante* Savings for Lighting Measures by Building Type*

Building Type	*Ex Ante* Energy Savings (MWh)	*Ex Ante* Demand Savings (kW)
Manufacturing	11,167	1,405
Office	6,592	1,327
Outdoor	2,954	1
Warehouse: Non-Refrigerated	2,043	387
Warehouse: Refrigerated	1,397	202
Food Service: Sit-down Restaurant	998	198
Lodging (Hotel/Motel/Dorm): Common Areas	950	132
Multi-family Housing: Common Areas	916	154
Parking Structure	888	107
Retail: Excluding Malls & Strip Centers	844	212
Health Care: In-Patient	766	112
Food Sales: Non 24-Hour Supermarket/Retail	588	120
Retail: Strip Shopping & Non-Enclosed Mall	509	127
Lodging (Hotel/Motel/Dorm): Rooms	338	43
Nursing & Resident Care	304	57
Retail: Enclosed Mall	301	63
Education: k-12, w/o Summer Session	287	53
Religious	275	85
Public Order and Safety	273	47
Education: College, University, Vocational, Day Care, and K-12 w/ Summer Session	230	48
Food Service: Fast Food	87	12
Public Assembly	78	16
Food Sales: 24-Hour Supermarket/Retail	62	8
Health Care: Out-Patient	45	11
Service (Excluding Food)	17	5
Total	32,908	4,929

* Gross savings are presented excluding line losses.

The Evaluation Team conducted site visits at 22 C&I Prescriptive projects to verify that the reported equipment was installed and operating and to install light loggers on a sample of lighting measures at

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each facility. We leveraged the results with data from 17 2013 site visits conducted for other programs, including CitySmart and Small Business. We collected data for at least seven weeks at each facility and analyzed the data to estimate realization rates for energy savings and demand reduction. The peak hours were defined by EAI as Monday through Friday from 1:00 p.m. to 8:00 p.m. In total for all EAI programs with light metering, the Team obtained measured lighting use from 240 loggers on a sample of measures at 37 projects. This included 15 offices, six manufacturing, 10 retail (excluding malls and strip centers), five retail (strip shopping non-enclosed mall), and one warehouse building type. The Evaluation Team developed a light logger plan to capture representative lighting operation for each site, basing the number and location of loggers for each site, the number of space types, and the magnitude of savings by space and fixture type.

For manufacturing projects and for two of the retail projects, we calculated weighted realization rates for energy savings and demand reduction per site, based on the operation and connected wattage of each logged measure. We further defined the operation of each site by assigning loggers or averages of loggers to similar space type locations within the same site. The Evaluation Team then combined the evaluated savings by building type and determined overall realization rates by building type for energy savings and demand reduction. We applied these building type realization rates to lighting projects with those same building types in the C&I Prescriptive Program (Table 133). The one warehouse site was large so we analyzed it separately.

Table 133. 2013 Site Visit Data

Building Type	Realization Rate		2013	
	MWh %	kW%	# Meters	# Site Visits
Office	76%	74%	118	15
Retail: Excluding Malls & Strip Centers	76%	61%	53	10
Retail: Strip Shopping & Non-enclosed Mall	103%	93%	24	5
Manufacturing	92%	99%	33	6
Warehouse: Refrigerated	115%	97%	12	1
Total			240	37

Table 134 shows project-level realization rates for each site.

Table 134. EAI C&I Project Realization Rates at the Site Level

Building Type and Project ID	Program	*Ex Ante*		*Ex Post*		Realization Rate	
		MWh	kW	MWh	kW	MWh	kW
Office							
PRJ-106171	C&I Prescriptive	75	17.0	45	13.9	61%	82%
PRJ-109368	C&I Prescriptive	67	14.9	46	11.7	68%	79%
PRJ-11929	C&I Prescriptive	75	17.4	58	10.3	77%	59%
PRJ-5314 *	C&I Prescriptive	113	12.4	81	12.2	72%	98%
PRJ-117373	C&I Prescriptive	36	8.2	27	5.3	73%	65%
PRJ-106183	C&I Prescriptive	187	34.6	178	29.2	96%	84%

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Building Type and Project ID	Program	*Ex Ante*		*Ex Post*		Realization Rate	
		MWh	kW	MWh	kW	MWh	kW
PRJ-106187	C&I Prescriptive	130	29.4	111	24.2	86%	82%
PRJ-119423 *	C&I Prescriptive	60	13.5	101	12.4	170%	92%
PRJ-121810 *	C&I Prescriptive	42	9.5	38	8.7	90%	91%
PRJ-105529	CitySmart	126	28.5	57	14.5	45%	51%
PRJ-99609	Small Business	37	8.3	8	5.5	50%	66%
PRJ-107286	Small Business	19	4.3	18	2.4	44%	57%
PRJ-110806	Small Business	42	9.1	23	7.6	56%	84%
PRJ-113544	Small Business	23	5.3	16	4.6	70%	88%
PRJ-96056	Small Business	81	17.8	40	7.2	49%	41%
Total		1,112	230.3	849	169.9	76%	74%
Retail: Excluding Malls & Strip Centers							
PRJ-5678	C&I Prescriptive	79	20.4	63	13.5	80%	66%
PRJ-108720	C&I Prescriptive	180	36.6	126	22.8	70%	62%
PRJ-106135	C&I Prescriptive	35	8.6	37	8.0	107%	93%
PRJ-113533	Small Business	32	8.0	17	2.8	53%	35%
PRJ-93584	Small Business	26	6.4	14	3.4	55%	53%
PRJ-108739	Small Business	11	3.1	7	1.7	65%	54%
PRJ-115376	Small Business	42	10.9	53	10.0	127%	92%
PRJ-108599	Small Business	83	22.5	52	10.2	63%	45%
PRJ-99604	Small Business	23	5.8	18	4.0	81%	70%
PRJ-110314	Small Business	28	7.2	18	2.7	66%	38%
Total		539	129.6	407	79.2	76%	61%
Retail: Strip Shopping & Non-enclosed Mall							
PRJ-97955	C&I Prescriptive	148	35.6	177	36.8	119%	103%
PRJ-107142	Small Business	10	2.6	5	1.1	52%	42%
PRJ-94207	Small Business	16	1.3	16	0.7	100%	53%
PRJ-94801	Small Business	17	4.3	15	4.8	90%	111%
PRJ-107265	Small Business	44	10.9	28	7.7	64%	70%
Total		235	54.7	242	51.0	103%	93%
Manufacturing							
PRJ-42569	C&I Prescriptive	248	31.5	209	33.1	84%	105%
PRJ-115363	C&I Prescriptive	191	24.3	104	9.7	54%	40%
PRJ-121178	C&I Prescriptive	164	25.2	156	22.0	96%	87%
PRJ-91212	C&I Prescriptive	79	10.1	32	15.1	41%	149%
PRJ-5314 *	C&I Prescriptive	608	45.6	668	49.1	110%	108%
PRJ-119423 *	C&I Prescriptive	165	15.1	165	20.7	100%	137%
Total		1,455	151.8	1,335	149.7	92%	99%
Warehouse: Refrigerated							
PRJ-121810 *	C&I Prescriptive	982	150.6	1,124	146.3	115%	97%

* These projects had 2 building types assigned to different areas. We metered each building type measure separately (e.g., Manufacturing and Office).

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One of the Team's goals for C&I light logging was to gather primary data on local conditions in Arkansas that may lead to more precise parameter values in the TRM. After conducting two years of light logging research, at the Team determined that an average AOH of 3,227 for office building types, with a CF of 0.50 is more consistent with local conditions than the TRM 3.0-specified values of 3,737 AOH and 0.77 CF. The 95% (two-tail) upper confidence limits of the estimated means were 3,727 and 0.57, which are both below the TRM 3.0 values.[99] We applied these primary data to office lighting savings for 2013 (Table 135).

Table 135. Office Building Type Annual Operating Hours from 2012 and 2013 Meters

Parameter	Sites	Fixtures	Mean	Standard Error	TRM V 3.0	Evaluated
AOH	18	139	3,227	237	3,737	3,227
CF	18	139	0.50	0.03	0.77	0.50

Desk Review of Measures

The Evaluation Team reviewed the TRM 3.0 formulas and inputs for each of the measures implemented in the C&I Prescriptive Program to verify they were reasonable. We used raw measure data from the EAI ArchEE database to recalculate savings for the census of measures and to verify that the implementer applied the TRM algorithms correctly.

For this task, we used the EAI ArchEE database-listed details for the location, building type, and space type of each project. We used equipment type, quantities, nameplate size designation, nameplate efficiency, and hours of operation for both pre- and post-installation conditions.

New Construction Lighting

We calculated savings for new construction projects as the difference between the quantity and wattage that were installed and the lighting wattage determined by building type and square footage. There was a change between TRM Version 3.0 (Vol. 2, Sec 3.6.3 and Vol. 3, Appendix F) and TRM Version 2.0 (Vol. 3, Sec 3.6.3 and Vol. 3, Appendix F). In TRM 3.0, Appendix F, Tables F1-F4 were updated with new, lower ASHRAE 90.1-2007 Lighting Power Densities (LPD) Building Area Method and Space-by-Space Method values, while TRM 2.0 was based on ASHRAE 2001. The majority of projects in 2013 were reported using the LPDs from TRM 2.0 using the Building Area Method. We recalculated savings for 22 of the 27 C&I Prescriptive 2013 projects implemented. We used TRM 3.0 LPDs with the Building Area Method for the majority of sites. We also used TRM 3.0 LPDs with the Space-by-Space Method where appropriate. Our realization rates for these projects were 52% for energy savings and 47% for demand reductions. We

[99] To estimate average AOH and CF, we weighted logger data for each project by the percent of savings represented by each logger. Then, we weighted across projects to represent the relative contribution of each to total savings. In estimating uncertainty, we clustered error at the project level to account for variance across loggers was well as variance across projects.

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applied these realization rates across all of the program's new construction lighting projects. Table 136 compares *ex ante* and *ex post* values for each of the new construction projects we reviewed.

Table 136. New Construction Lighting Realization Rates

Project ID	Ex Ante		*Ex Post*		Realization Rate		Lighting Power Density Method
	MWh	kW	MWh	kW	MWh	kW	
PRJ-106233	10	3	5	1	47%	50%	Whole Building
PRJ-113603	34	8	34	8	100%	100%	Whole Building
PRJ-128050	438	75	503	89	115%	120%	Space by Space
PRJ-128058	142	16	61	7	43%	43%	Whole Building
PRJ-128606	383	73	417	72	109%	98%	Space by Space
PRJ-129153	91	12	46	6	50%	50%	Whole Building
PRJ-132170	33	6	26	5	79%	82%	Whole Building
PRJ-133827	22	6	11	3	51%	50%	Whole Building
PRJ-137195	109	9	106	13	97%	146%	Space by Space
PRJ-140043	14	4	12	3	88%	78%	Whole Building
PRJ-141003	16	4	12	3	72%	74%	Whole Building
PRJ-141366	1,220	171	1,220	171	100%	100%	Space by Space
PRJ-143481	14	4	8	2	57%	57%	Whole Building
PRJ-148224	301	71	197	43	65%	61%	Space by Space
PRJ-153751	25	6	16	4	64%	67%	Whole Building
PRJ-157068	15	4	8	2	55%	58%	Whole Building
PRJ-165369	61	18	30	10	49%	55%	Whole Building
PRJ-165497	60	8	31	4	52%	52%	Whole Building
PRJ-173008	322	71	380	84	118%	118%	Space by Space
PRJ-55499	36	7	28	6	79%	83%	Whole Building
PRJ-55531	16	2	16	2	100%	100%	Whole Building
PRJ-92787	299	40	109	13	37%	32%	Whole Building
Total	3,662	618	3,276	552	89%	89%	

Note: Table may not sum due to rounding

Other Lighting Adjustments

We found instances of lighting projects in a manufacturing building where program staff used the specified AOH of 8,760 in savings calculations rather than using deemed hours. In some cases, staff left the CF at the manufacturer-deemed value of 0.73. Since AOH and CF are closely linked, we applied a CF of 1.0 when AOH is 8,760. This update led to 28 kW of additional demand reduction for the program.

Exit Signs

Program staff used the TRM 3.0 values for the relevant building type for lighting AOH and CF to calculate savings for most exit signs. However, because exit signs operate continuously, their savings should be calculated based on 8,760 AOH and a CF of 1. The Evaluation Team applied this change, which led to an evaluated increase in savings for this measure type.

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Pre Rinse Spray Valves

Implementation staff installed pre-rinse spray valves for C&I Prescriptive Program participants as free direct install measures. The Evaluation Team's savings calculations matched the reported values for these measures. We note that TRM 3.0 (Vol. 2, Sec. 3.8.9) specifies the post-measure maximum flow rate of a qualifying pre-rinse spray valve as 1.28 gpm. The implementer captured the actual flow following installation, which was higher than 1.28 gpm in some cases. However, the implementer documented that all valves were rated at 1.28 gpm or lower, so the Team calculated savings based on the *measured* maximum flow rate.

HVAC - Packaged Terminal Air Conditioner

On a single installation at a lodging building type, implementation staff used a CF of 1.0. The Evaluation Team recalculated the demand savings using the TRM 3.0 (Vol. 2, Sec. 4.2)-specified value of 0.77 CF based on building type.

Other Measures

The Evaluation Team did not identify any discrepancies in savings values for any other measures in the C&I Prescriptive Program.

Evaluated Gross Savings Analysis and TRM Review

The total evaluated gross energy savings for the C&I Prescriptive Program in 2013 was 37,354 MWh, with a demand reduction of 5,764 kW. The final claimed (*ex ante*) and evaluated (*ex post*) gross energy savings and demand reduction estimates are shown in Table 137 and Table 138, respectively. These savings are estimated at the meter and thus *do not include line losses*.

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Table 137. C&I Prescriptive Program *Ex Ante* and *Ex Post* Gross Energy Savings*

Measure Category	Description	*Ex Ante* Energy Savings (MWh)	*Ex Post* Energy Savings (MWh)	Realization Rate
Appliances	Vending Miser	555	555	100%
Domestic Hot Water	Faucet Aerator	2,309	2,309	100%
	Pre Rinse Spray Valve	114	114	100%
HVAC	Heat Pump	10	10	100%
	PTAC Equipment	10	10	100%
	Unitary AC	230	230	100%
	Water Chilling Equipment	181	181	100%
Lighting	CFL	930	1,014	109%
	Halogen	3	4	104%
	HID	801	801	100%
	LED	9,246	9,153	99%
	Lighting Control	1,438	1,352	94%
	Linear Fluorescent	20,488	19,259	94%
	Modular CFL and CCFL	2	3	143%
	New Construction Lighting	4,071	3,623	89%
Motors	Anti-Sweat Heater Control	27	27	100%
	ECM for Refrigeration	10	10	100%
Other	Custom	100	100	100%
Plug Load	PC Power Management	107	107	100%
Total Savings		40,632	38,861	96%

* Gross energy savings for measures are presented excluding line losses.

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Table 138. C&I Prescriptive Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Savings*

Measure Category	Description	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
Appliances	Vending Miser	0	10	0%
Domestic Hot Water	Faucet Aerator	662	662	100%
	Pre Rinse Spray Valve	15	15	100%
HVAC	Heat Pump	4	4	100%
	PTAC Equipment	8	6	77%
	Unitary AC	96	96	100%
	Water Chilling Equipment	42	42	100%
Lighting	CFL	152	156	103%
	Halogen	0	1	109%
	HID	31	32	104%
	LED	1,243	1,181	95%
	Lighting Control	258	217	84%
	Linear Fluorescent	3,247	2,987	92%
	Modular CFL and CCFL	(1)	(1)	65%
	New Construction Lighting	622	553	89%
Motors	Anti-Sweat Heater Control	0	0	100%
	ECM for Refrigeration	1	1	100%
Other	Custom	56	56	100%
Plug Load	PC Power Management	5	5	100%
Total kW Demand Reduction		6,442	6,025	94%

* Gross demand reduction for measures are presented excluding line losses.

Significant differences between *ex ante* and *ex post* savings are due to the following:

- For lighting and lighting controls, the Team found (through two subsequent years of metering site visits across multiple programs) that the actual AOH and CF for the office building type are less than the deemed TRM 3.0 values (Vol. 2, Sec. 3.6.3). We applied the measured AOH and CF to all office building type projects. This led to lower evaluated kW and MWh savings.
- For lighting and lighting controls, our site visits at manufacturing and retail sites in 2013 revealed that the actual realization rates of projects based on metering HOU were less than the reported realization rates used in savings calculations. We applied the actual building type realization rates to projects with those respective building types, which led to lower evaluated kW and MWh savings.
- For new construction lighting, the TRM 3.0 (Vol. 2, Sec. 3.6.3 and Vol. 2, Appendix F) Table F1 uses a lower ASHRAE 90.1-2007 Lighting Power Densities (LPD) Building Area Method and Space-by-Space Method values than TRM 2.0. Many projects in 2013 were reported using the LPD Building Area Method from TRM 2.0 (Vol. 3, Sec. 3.6.3 and Vol. 3, Appendix F), which was based

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on the 2001 ASHRAE. The Team used TRM 3.0 Building Area Method and Space-by-Space Method values, leading to lower evaluated kW and MWh savings.

- For vending misers, the TRM 3.0 (Vol. 2, Sec. 3.7.4) assigns a per-unit benefit to energy as well as peak demand savings. Staff did not claim kW savings for this measure, but the Team assigned kW savings per TRM 3.0.
- For exit signs, we found instances where staff based the AOH and CF on the building type deemed hours. Since exit signs run continuously, we adjusted the hours to 8,760 and the CF to 1.0. This led to higher evaluated kW and MWh savings for this measure.

Net-to-Gross Analysis

The Evaluation Team calculated two distinct freeridership rates for C&I Prescriptive Program, one for participants and one for contractors, following the analysis methodology outlined in the Evaluation Methodology section of this report. Details specific to the C&I Prescriptive Program are outlined below.

Participant Freeridership

As some customers installed more than one program measure, the Team assessed participant freeridership at the measure level rather than at the participant level. We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had pre-existing plans to purchase or install the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without the program, they would have installed a program-eligible measure of the same (or higher) efficiency within a year.

Table 139 shows the survey questions we used to assess freeridership for each criterion. The Team then used the three freeridership criteria scores to determine overall program freeridership.

Table 139. C&I Prescriptive Program Participant Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans for Measure Installation	Before learning about the EAI C&I Prescriptive Program, was your organization already planning to purchase and install the measure in 2013?*
Available Budget	If the program incentive had not been available, how likely is it that your 2013 budget would have included the full cost of the measure?*
Stated Intent	Without the incentive, would you have purchased a measure that had the same level of efficiency, higher efficiency, or lower efficiency?
	Without the incentive, would you have purchased the measure ....(sooner, at the same time, later in the same year, in one or two years, etc.)?

* The Team varied question wording slightly depending on the number of measures installed by the contractor.

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The Evaluation Team asked 71 participants about 93 measures they installed through the program.[100] We identified freerider measures as those that met all three criteria. Responses indicated that there were no freerider measures. Accordingly, the *unweighted unadjusted* participant freeridership rate is estimated as 0%, as shown in Table 140.

Table 140. C&I Prescriptive Program Unweighted Unadjusted Participant Freeridership Rate

Freeridership Criteria	Unweighted Percent of Measures That Met Criteria (n=93)*
Prior Plans for Measure Installation	17%
Available Budget	13%
Stated Intent	9%
Unweighted Freeridership Rate	0%

Contractor Freeridership

The Evaluation Team interviewed eight trade allies to estimate the overall freeridership rate for all EAI C&I programs.[101] As these contractors had worked across multiple EAI programs, it was not possible to determine freeridership on a program level.

We determined the contractor freeridership rate by calculating the influence of the EAI C&I programs on their installation of high-efficiency equipment and services. Specifically, we asked respondents who said that their sales of a particular program-supported measure would have been lower in the absence of the program, "By what percentage do you estimate your number of jobs from the measure would be lower if the program had not been available?" We then calculated the number of freerider jobs (those that would have happened in absence of the program) for each contractor by subtracting their reported percentage from 100% and multiplying the resulting percentage by the total number of jobs done by that contractor through an EAI C&I program in the past year.

In total, the eight contractors reported installing or performing 163 program-supported jobs, 22 of which were freerider jobs. The resulting contractor freeridership rate, unweighted by the measure savings associated with the jobs, was 13%.

Adjusted Freeridership

The Evaluation Team applied the unweighted contractor freeridership rate to participants who reported that the contractor or equipment supplier was important in their decision to purchase and install program measures. We determined contractor importance by asking about the importance of: 1) advice from the equipment supplier or contractor, and 2) the energy assessment report (Table 141). If

[100] The Team surveyed an additional 14 participants regarding an additional 150 measures, but these measures were not included in this analysis because we could not verify them as having been installed through the program based on the program tracking database.

[101] The Team interviewed 20 EAI contractors, of whom eight gave valid freeridership estimates.

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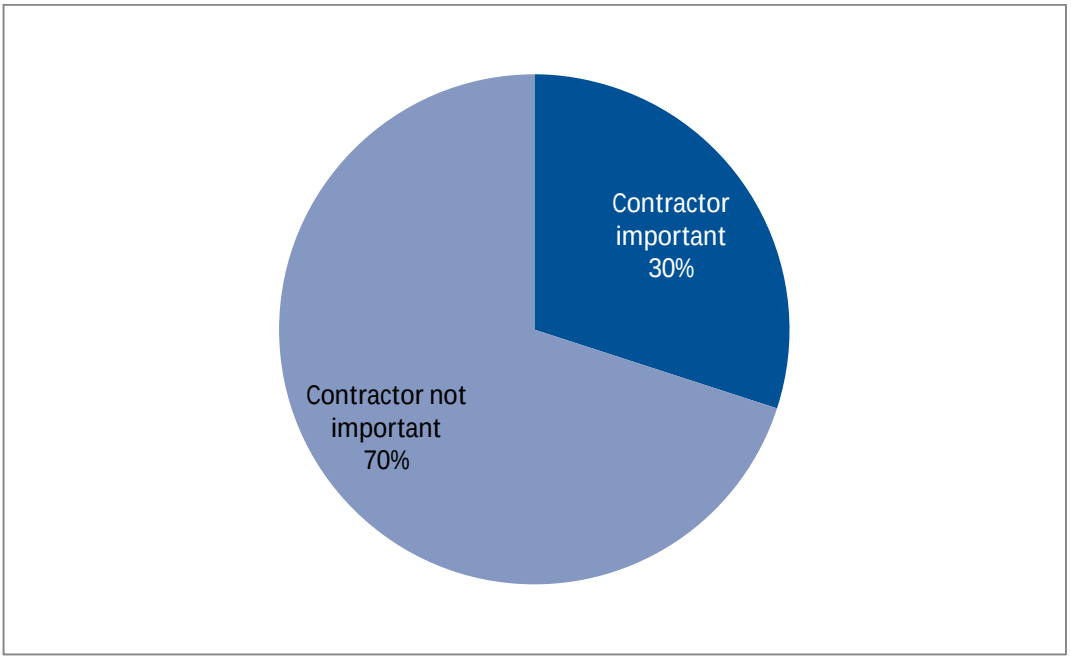
respondents indicated that both of these factors were very important to their installation decisions, then we considered their contractors/equipment suppliers to be important in their decision to purchase and install program measures.

Table 141. C&I Prescriptive Program Participant Contractor Importance Questions

Survey Question	Response Categories
In general, how important was advice from your equipment supplier or installation contractor in your decision to purchase the equipment you installed through the program(s)?	Very Important Somewhat Important Not Very Important Not at all Important
In general, how important was the energy assessment by your contractor or program staff in your decision to purchase the equipment you installed through the program(s)?	

Participants who indicated that the contractor was important in their decisions to install represented 30%, or 28, of the 93 measures (Figure 58). For these measures, we substituted the contractor freeridership estimate for the participant freeridership estimate.

Figure 58. Contractor Importance in Customers' Decisions of C&I Programs' Measures to Install



Q39 and Q41 (n=93 measures; 71 respondents)

None of the measures for which participants deemed the contractor to be important were freerider measures according to the participant responses. As a result, while the overall unadjusted participant freeridership rate was 0%, after applying the *unweighted* contractor freeridership rate of 13% to the 28 measures for which the contractor was important, the *adjusted unweighted* participant freeridership rate is 4% (Table 142).

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Table 142. C&I Prescriptive Program Participant Unweighted Adjusted Freeridership Rates by Contractor Importance

Contractor Importance	Number of Measures	% of Measures	Freeridership Rate Type	End-User Estimated, Unadjusted Freeridership Rate	Adjusted Freeridership Rate
Contractor was not important	65	70%	Unadjusted end-user participant	0%	0%
Contractor was important	28	30%	Contractor	0%	13%
All	93	100%	Overall end-user participant	0%	4%

Weighted Freeridership

To account for the different savings values associated with each of the installed measures, the Evaluation Team weighted the freeridership results by the program savings for each measure to estimate the final freeridership rate.

When the Team weighted the results by the savings associated with the measures installed by the contractors, the unweighted contractor freeridership rate of 13% increased to 17% . As the participants' *unadjusted, unweighted* freeridership rate was 0%, weighting by savings made no difference; therefore, the *unadjusted, weighted* freeridership rate for contractors was also 0%.

To estimate unadjusted, weighted net savings, the Evaluation Team derived the NTG of 100% minus the freeridership rate, and applied it to the gross savings associated with the 93 measures installed by respondents. The gross savings summed to 6,542,463 kWh (Table 143). As the NTG was 100%, the unadjusted, weighted net savings was equal to the gross savings.

However, if a participant said their contractor had been important to their decision to install a specific measure, then we applied the weighted contractor freeridership rate (17%) to that measure's savings. After applying the weighted contractor freeridership rate, the ratio of the sum of net savings to gross savings results in an *adjusted, weighted* freeridership rate of 3%. Table 143 shows the gross and net savings corresponding with these adjusted freeridership rates.

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Table 143. Participant Weighted Unadjusted and Adjusted Freeridership Rate for C&I Programs

Stratum	Total Measures	Gross Savings (kWh)	Unadjusted Net Savings		Adjusted Net Savings*	
			% Assigned	Net Savings (kWh)	% Assigned	Net Savings (kWh)
Contractor Important – Non-Freerider	28	985,010	100%	985,010	83%	817,558
Contractor Unimportant – Non-Freerider	65	5,557,454	100%	5,557,454	100%	5,557,454
Contractor Important - Freerider	0	0	0%	0	83%	0
Contractor Unimportant – Freerider	0	0	0%	0	0%	0
Total	93	6,542,463		100%		
Weighted Freeridership						3%

* The Team assigned a weighted contractor freeridership rate of 17% to measures for which the contractor was important in the participant's decision to install.

Spillover

The Evaluation Team attempted to calculate spillover values for end-user participants and contractors in the C&I Prescriptive Program. We quantified like-spillover, which is equipment installed outside of the program that is exactly the same type and efficiency as the equipment installed through EAI programs, where their experience with the program was important to their implementing the measures.

The following criteria are required for a measure to be considered spillover:

- The service or measure is offered in the program portfolio,
- The customer did not receive a rebate or incentive for the measure, and
- The customer's or contractor's experience with the program was somewhat or very important in their decision to install the measure.[102]

Three program participants reported performing or installing one program-eligible interior lighting measure and two air conditioning measures that qualified as like-spillover. One contractor reported installing three program-eligible lighting controls, for which they did not receive a rebate and the program was important in their decision.

Based on the average energy savings for each spillover measure as listed in the program tracking data, the Evaluation Team estimated 148,643 kWh of energy savings for the six like-spillover measures. The resulting spillover rate estimate is 2% of gross savings (Table 144).

[102] The Evaluation Team asked respondents to identify the extent to which the program influenced their non-program sales (contractors) and non-program purchases (participants) using a scale of very important, somewhat important, not very important, or not at all important.

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Table 144. Participant Spillover Savings

Measures/Actions	Number of Measures	Savings per Measure (kWh)	Total Spillover Savings (kWh)
Interior lighting	1	114,216	114,216
Air conditioners	2	15,030	30,060
Lighting controls	3	1,456	4,368
Total Spillover Savings	6		148,644
Total Gross Savings	6,542,463		
Spillover Rate	2%		

In addition, four participants installed or performed non- program-like measures for which they did not receive rebates, but for which the program was important in their decision. These measures were window film, duct work, a building energy assessment, and encouraging staff members to take energy-savings actions.

The Evaluation Team surveyed nonparticipants to determine if there was spillover among this group. The analysis revealed no evidence of nonparticipant spillover.

Net-to-Gross

Table 145 presents the NTG ratio for C&I Prescriptive Program.

Table 145. Net-to-Gross Ratio Values and Calculation

Parameter	Value
Weighted Freeridership Rate	0.03
Spillover	0.02
Net-to-Gross Ratio: *(1 - Adjusted Freeridership + Spillover)*	0.99

Evaluated Net Savings

The final evaluated net savings for the C&I Prescriptive Program are shown in Table 146. Applying the 0.99 NTG ratio to *ex post* gross savings results in *ex post* net energy savings of 38,900 MWh and coincident peak demand reduction of 6,002 kW. The values shown are presented net of line loss.

Table 146. C&I Prescriptive Program Evaluated Net Savings

Savings	Evaluated Gross Savings	Net Savings	Net-to-Gross Ratio
Coincident Peak Demand Reduction (MW)*	6,025	5,965	0.99
Annual Energy Savings (MWh)*	38,861	38,472	0.99

* Savings are presented net of line loss.

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Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Program Design

Adjustments to the incentive strategy were not enough to drive goal attainment in 2013 and may have helped funnel potential C&I Prescriptive participants to the C&I Custom program.

As suggested in the 2012 evaluation recommendations, staff increased program incentives in 2013, from $0.09 per kWh to $0.15 per kWh. EAI also allowed participants to bundle prescriptive measures with custom measures to access the C&I Custom Program tiered incentive structure. Finally, staff increased the program incentive cap so that a single project could receive incentives of up to 50% of the annual program budget, up from 20% in 2012.

While these efforts dramatically improved program participation during 2013, with 588 unique projects installed in 2013 compared with 241 projects completed in 2012, they were not sufficient to meet the program goals. Further, these changes did not positively impact customer satisfaction. While 87% of 2012 participants indicated they were "very satisfied" with the program incentive amount, only 60% reported this level of satisfaction in 2013.

However, allowing participants to bundle prescriptive and customer measures helped the C&I Custom Program more than double its 2012 participation[103] and to exceed its 2013 energy savings goals by more than 100%. Program staff reported that the decision to allow measure bundling in the C&I Prescriptive Program encouraged more C&I Custom Program participation. Participants who started in the C&I Prescriptive Program realized they could obtain higher incentives for their prescriptive measures by bundling them with at least one custom measure to qualify for the C&I Custom Program tiered incentive structure.

Resource constraints were a barrier to pursuing energy-efficiency upgrades.

Forty-five percent of surveyed customer respondents (38 of 85) said they face challenges when making energy-efficiency upgrades to their facilities. As illustrated in Figure 59, among the 35 customers who reported specific challenges, the high initial cost of efficient equipment was the most commonly cited (14 respondents), followed by budget limitations (11 respondents).

[103] The C&I Custom Program had 23 unique projects completed in 2012 compared to 58 in 2013.

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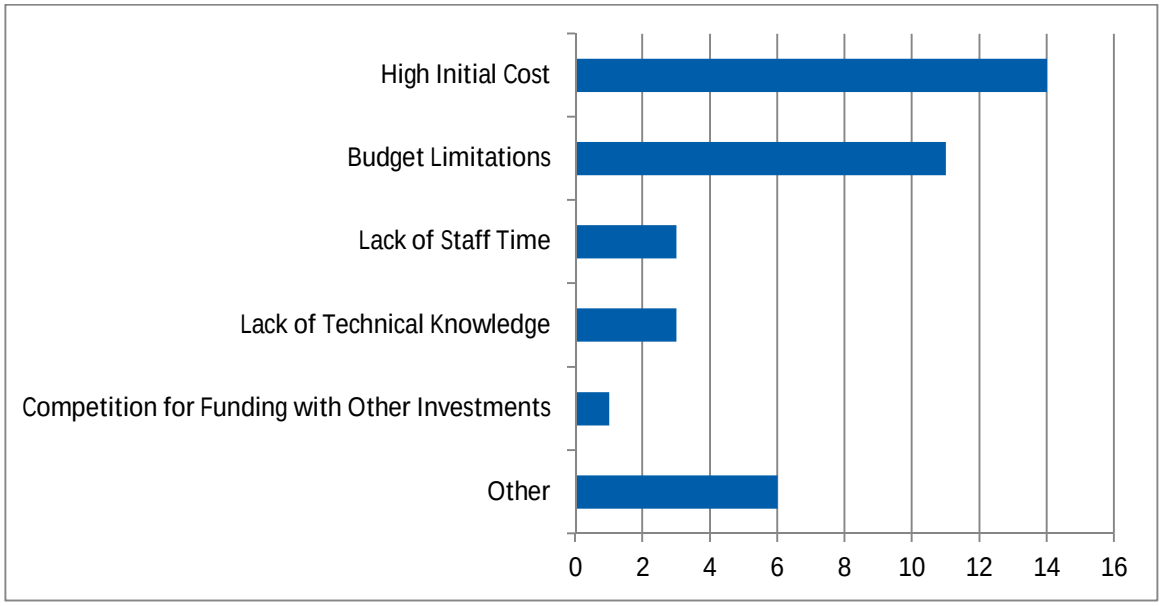
Figure 59. Challenges Customers Face When Making Energy-Efficiency Upgrades



Q21. Can you tell me what these challenges are? [Multiple responses allowed; only asked respondents who said they faced challenges in making energy-efficiency upgrades in their facilities] (n=35)

Marketing and Outreach

While direct contact remained the primary driver of program awareness in 2013, more customers learned about the program through indirect marketing efforts than in the past.

Participants most commonly heard about the program from the implementer (24%), followed by trade allies (22%), and EAI account managers (14%; Figure 60).

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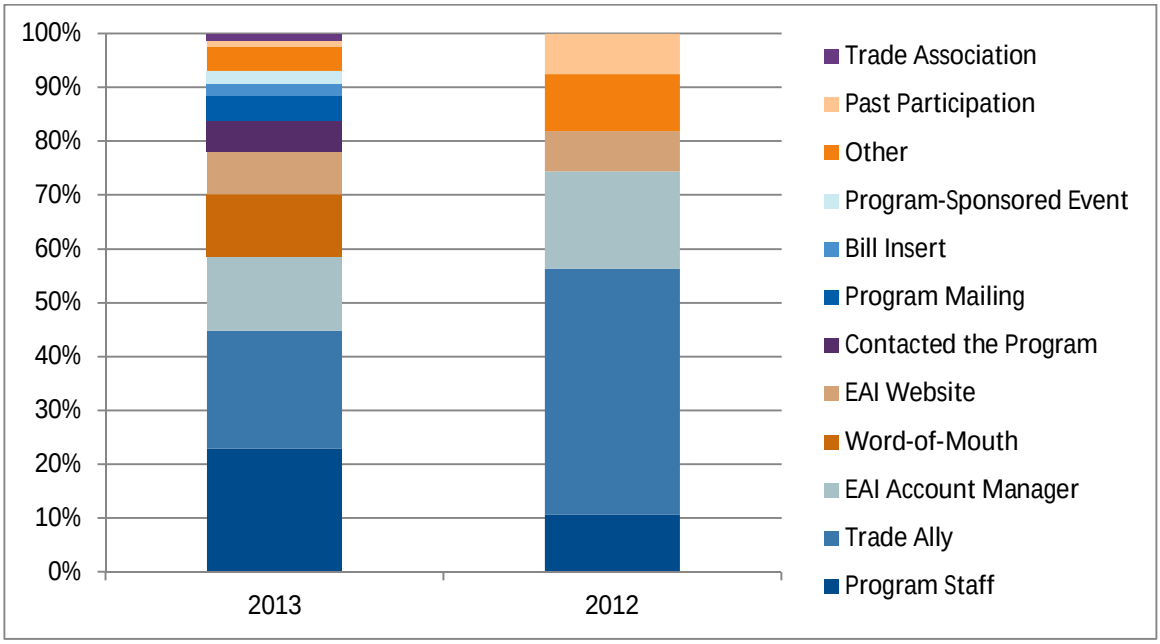
Figure 60. How Participating Customers Heard About the Program



Q9. In what ways have you heard about Entergy energy-efficiency programs? [Multiple responses allowed; only asked respondent who indicated familiarity with EAI programs] (n=27 in 2012, n=85 in 2013)

Given the small size of the customer survey population in 2012 (27 respondents verses 85 in 2013), the changes in awareness shown in Figure 60 are not statistically significant.

The most common way nonparticipants reported learning about the program was through direct mail, either via a program mailing or bill insert (Figure 61). In 2013, a substantially larger percentage of nonparticipants heard about the program from a program mailing, bill insert, word-of-mouth, or from attending an event than in 2012. The percentage of nonparticipants who said they heard about the program from television declined from 2012 to 2013.

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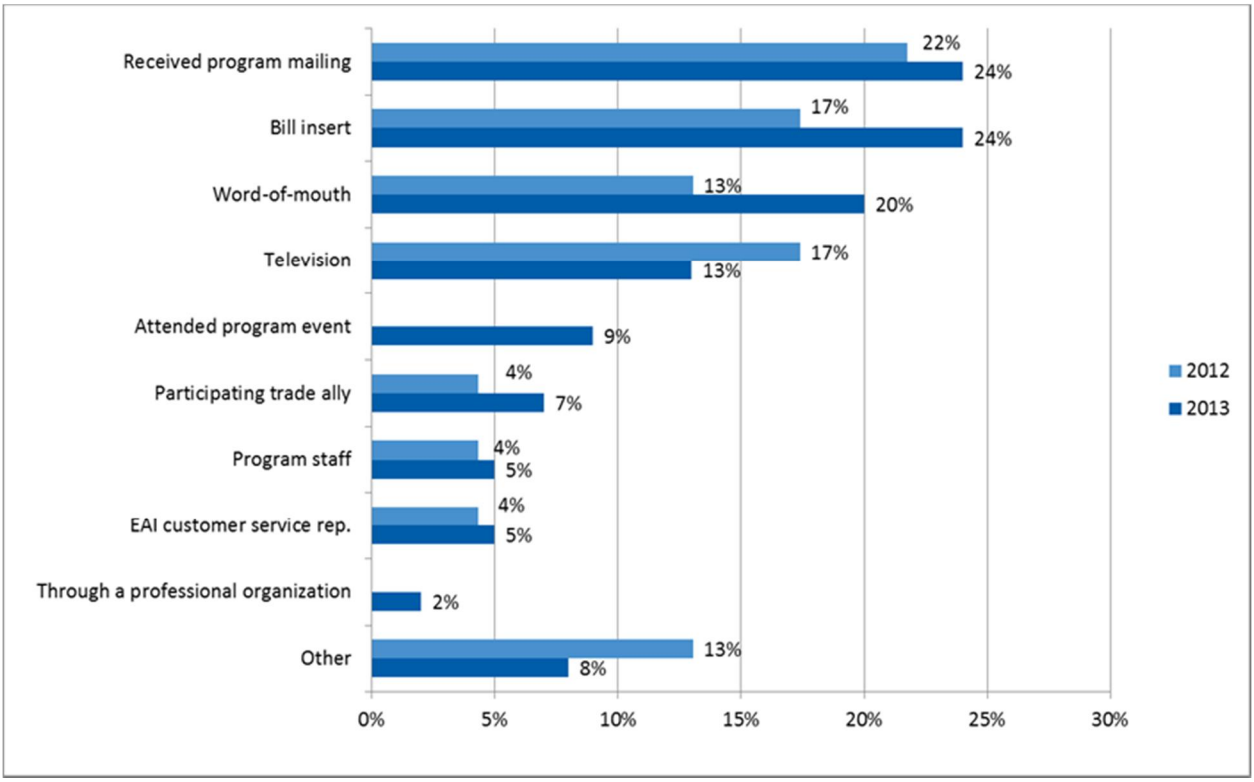
Figure 61. How Nonparticipating Customers Heard About the Program



Q9 (2013) and Q8 (2012). In what ways have you heard about Entergy energy-efficiency programs? [Multiple responses allowed; only asked respondents who were familiar with EAI programs] (n=23 in 2012, n=100 in 2013)

Awareness improved for all EAI commercial programs in 2013, but remains low for C&I Prescriptive.

Forty percent of nonparticipants said they were aware EAI offers programs to help C&I customers save energy and money. This reflects an improvement over 2012 results, when 32% said they were aware of EAI's commercial programs. Of those who were aware of EAI's C&I programs, 6% had heard of C&I Prescriptive, a slight increase from 2012 (4%; Figure 62).

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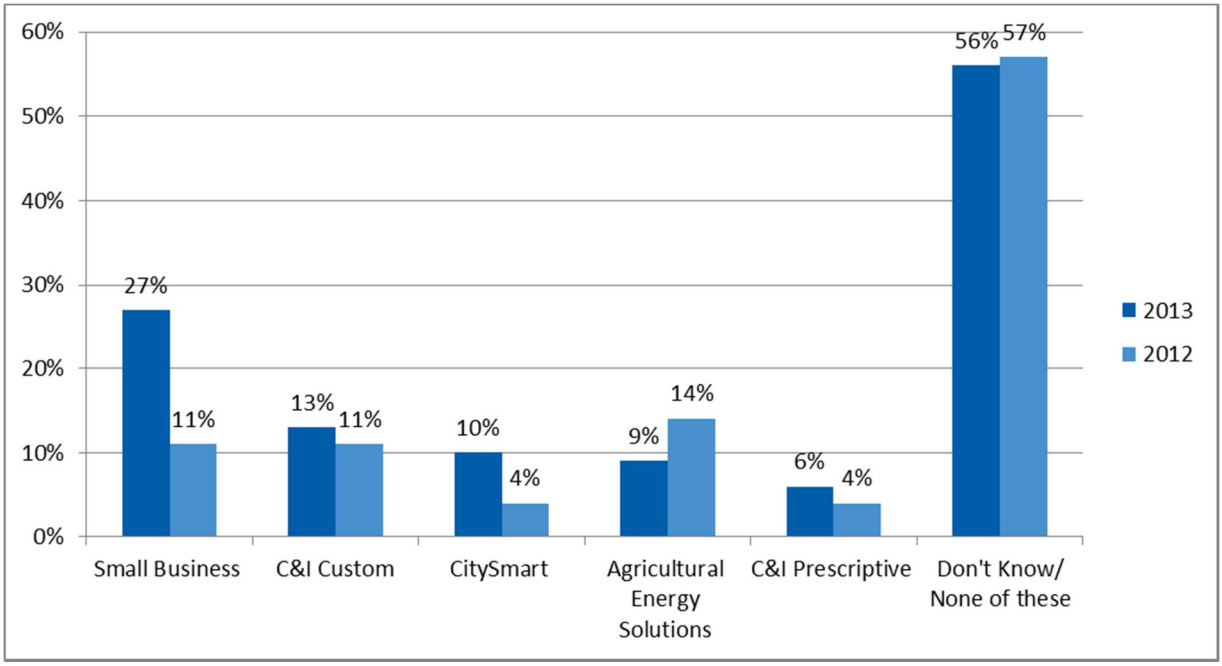
Figure 62. Nonparticipant Program Awareness, by Year



Q6A (2013) and Q5A (2012). Which of the programs were you aware of? [Multiple responses allowed] (n=28 in 2012, n=110 in 2013)

Program growth may be possible by targeting underrepresented business types.

By comparing participant and nonparticipant survey responses to demographic questions, the Evaluation Team assessed each business segment's response rate to the program compared to the response rate of the general business population. Figure 63 shows the facility use distribution for participants and nonparticipants. These results indicate that the program had a disproportionately better response rate from customers in the religious, manufacturing, hotel/motel, and warehouse segments in 2013.

Furthermore, these results show that the following business types are underrepresented in the participant population compared to the nonparticipant population and may offer potential for program growth in the future:

- Retail/Personal Services
- Office
- Professional Services

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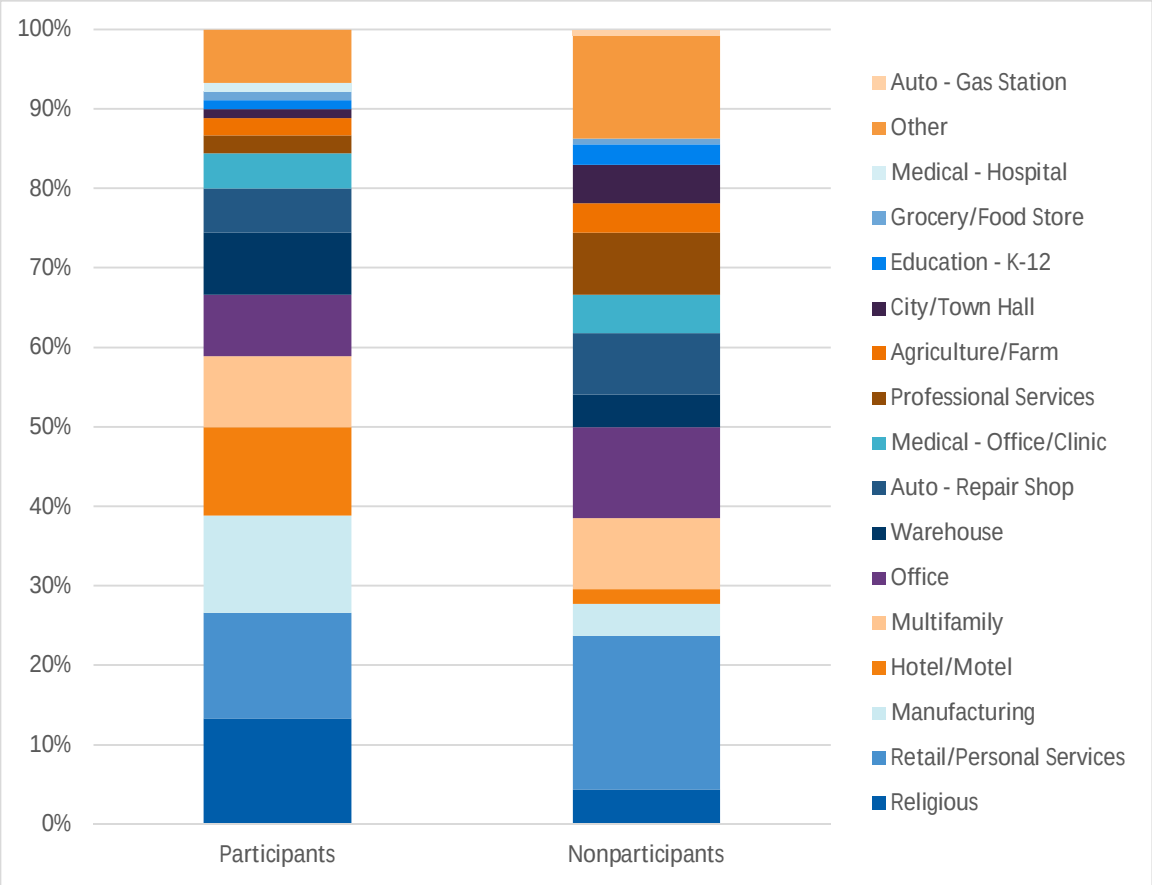
Figure 63. Business Types, Participants vs. Nonparticipants



Q4 (participant) and Q4 (non-participant): "What is the primary use of your facility?" (n=85 for participants, 277 for nonparticipants)

Marketing and Outreach

A dedicated trade ally coordinator improved relationships with trade allies and enhanced trade ally recruiting.

The implementation vendor hired a new trade ally coordinator to work across all EAI commercial programs. According to implementation staff, the trade ally coordinator acts as an ombudsman, listening to the trade allies' concerns and advocating on their behalf to other program team members. Other duties include managing trade ally communications and outreach efforts, as well as collecting trade ally feedback and arranging training. Trade allies offered positive feedback about the trade ally coordinator's efforts (see the Trade Ally Response section below for further information).

Program Delivery and Implementation

Establishing a suitable staffing level and structure is an ongoing program challenge.

EAI added program staff in 2013 and reorganized roles and duties to support a sales-oriented approach. Specifically, the implementation vendor designated three experienced staff to act as account managers,

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taking a sales-oriented approach to recruit program participants. The implementation vendor also added seven new technical staff members to support the account managers. Nevertheless, the program struggled to attract sufficient participants.

The program implementer plans to adjust the staffing structure again in 2014 in response to organizational changes at EAI that will eliminate the account service manager position. This position had served as a first step in helping implementer staff reach the appropriate customer contact. In 2014, the implementer plans to create positions with account management-like functions that will offer customers a single point of program contact.

Program Budget and Management

The program incentive budget was insufficient to meet program energy savings goals in 2013. Increasing the program's incentive amounts from $0.09 per kWh to $0.15 per kWh resulted in higher incentive costs than program staff had anticipated. Therefore, the full program incentive budget was allocated but the program fell short of its energy savings goals. For this reason, the program staff asked and received approval from the APSC to increase the budget in 2014.

Trade Ally Response

Trade allies were satisfied with their participation in the program, but experienced various challenges. Trade allies reported that program participation provided them with a variety of benefits. For example, trade allies said the program helped:

- Build relationships with customers because the program allows them to "bring something more."
- "Open doors with customers and provide an added value."
- Generate leads on projects.
- Shorten the payback and increase the ROI on lighting projects.
- "Expand our market in Arkansas."
- "Provide a more cost-effective way for customers to participate and save energy."

Most trade allies also reported that the program met their expectations for increasing sales and customer satisfaction.

Trade allies also noted that the program paperwork, incentive processing, and incentive levels enabled them to move forward quickly once customers expressed interest in pursuing a project. The following trade ally verbatim responses indicate aspects of the program that worked well for them:

- "The training was great."
- "The system in place is a good one."
- "CLEAResult processes data in a timely manner so that the customer sees the incentive estimate. It helps them move forward quickly."

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- "Paperwork process is simple."
- "It gives us an opportunity to have a warm introduction to customers" because customers are more receptive to the program offer than to a cold call.
- "The amount(s) of rebates are very good."

However, while trade allies commended program efficiencies, they also identified some areas in which the program presented sales challenges. For example:

- "It's harder to give away free money…people think there is a catch."
- "The hardest part is actually getting ahold of the right person at Entergy…that probably took six to eight different phone calls."
- "The only challenge is the products we're allowed to offer. Sometimes our products aren't always available from our suppliers."
- "The challenge for us is having the ability to identify which end user has opted out of the program."

Two trade allies noted that they had not received the leads they expected from the program, and that they found price competition between network trade allies to be fierce.

Trade allies were satisfied with the training CLEAResult provided.

Trade allies who attended trainings via webinar or in-person expressed satisfaction with the training. All 15 of the interviewed trade allies said the training prepared them to understand program steps and requirements, and to answer customer questions. In addition, two trade allies called attention to the accessibility and responsiveness of CLEAResult staff when they had questions.

Consistent with their high satisfaction levels, most trade allies did not identify potential training improvements. However, one trade ally suggested further training to facilitate networking opportunities across sectors, such as to help lighting vendors and HVAC contractors work together to sell comprehensive projects. This suggestion frequently comes up in commercial program evaluations, and many utilities are making an effort to put such training in place.

Customer Satisfaction

Overall, customers continued to be satisfied with program participation.

Seventy-five percent of participating customers surveyed said they were "very satisfied" with the program overall in 2013. Although satisfaction remained above 50% in 2013 for all related questions, it was lower than the reported satisfaction rates in 2012 (see Figure 64). However, the 2012 survey reflected a much smaller customer survey population (n=27) than in 2013 (n=85); therefore, the changes in satisfaction are not statistically significant.

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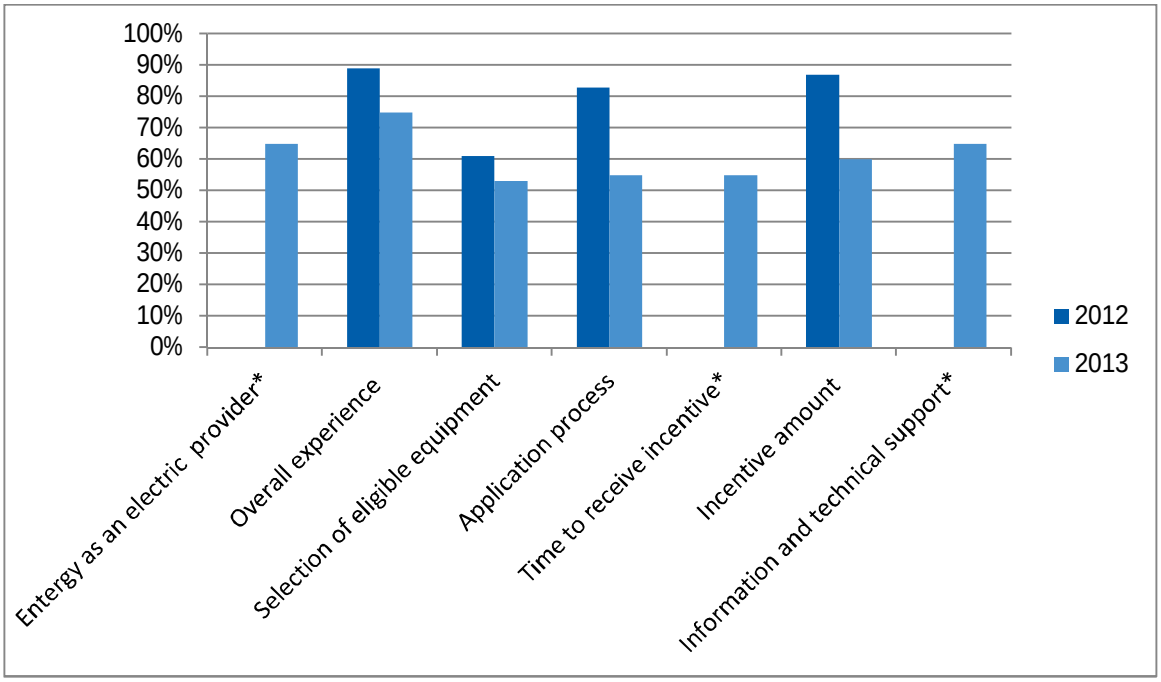
Figure 64. Percent of Very Satisfied Customers, by Year



Q58-Q66. "How satisfied are you with…?" (n=27 in 2012, n=85 in 2013)

* This was a new question in 2013.

TRM

For lighting projects, the TRM 3.0 (Vol. 2, Sec. 3.6.3) values for AHO and CF for the office building type do not reflect actual conditions in Arkansas.

As a result of conducting metering at 18 office building type sites over two subsequent years, the Evaluation Team determined AOH weighted by connected load. The TRM 3.0 specifies 3,737 AOH and a 0.77 CF for this building type, while our analysis revealed 3,227 AOH and a 0.50 CF.

Data Tracking and Reporting

The new construction lighting measure is complex to capture in the database and needs to be consistent, specific, and simplified.

The way EAI's tracking database represents the new construction lighting measure differs from most other measures, which involve a single line item that includes all the details necessary to calculate savings. New construction lighting has one line that reports the square footage, building type, LPD, and savings, then has subsequent lines that specify what lights were installed. In many cases, the difference between the LPD on the first line and on the multiple subsequent lines should match the savings declared on the first line. However, the Team could not confirm this because many database entries had a blank square footage or LPD.

Additionally, if a new construction lighting project had two building types, it was very difficult to determine which square footage was applied to the savings calculations. The implementer combined the

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controlled savings with the new construction savings, which blurs the distinction between the two measures. Lighting retrofits capture the lighting fixture savings and the lighting controls separately. In TRM 3.0 (Vol. 2, Sec. 3.6.2) Lighting Controls are tracked separately from TRM 3.0 (Vol. 2, Sec. 3.6.3) Lighting Efficiency. Since new construction lighting is a subset of TRM 3.0 (Vol. 2, Sec. 3.6.3) Lighting Efficiency, lighting savings from new construction should be tracked separately from lighting controls installed in a new facility.

Inconsistencies in the way the TRM 3.0 was applied to LPD for new construction led to higher reported savings.

The TRM 3.0 (Vol. 2, Sec. 3.6.3 and Vol. 2, Appendix F) is based on ASHRAE 90.1-2007 Lighting Power Densities (LPD) Building Area Method and Space-by-Space Method, while TRM 2.0 was based on the ASHRAE 2001 standard. The LPDs are now lower for all building types and space types. The implementer used the higher LPD values according to TRM 2.0, leading to higher reported savings than those the Team calculated based on TRM 3.0.

Evaluation Recommendations

Recommendations for the C&I Prescriptive Program include the following.

The Evaluation Team included recommendations relevant to TRM updates and data tracking system improvements in the Portfolio-Level Recommendations section.

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Commercial and Industrial Custom Solutions Program

The EAI C&I Custom Program offers technical assistance and incentives for all cost-effective energy-efficiency measures to any nonresidential customer with greater than 100 kW demand. These measures may be included in the Arkansas TRM, or they may be unique to a project with supporting documentation. Incentives are based on the number of qualifying measures installed and are capped at either: 1) 75% of project incremental costs or 2) a buy-down to a simple payback in 1.5 years. Funding assistance for feasibility studies may also be provided.

CLEAResult implements the program, which includes conducting trade ally outreach, assisting customers with project identification, processing applications, making pre- and post-installation inspections, and making incentive payments.

Program Status Overview

In 2013, EAI exceeded the C&I Custom Program's 31,056 MWh energy-savings goal by 104% and exceeded the 5.2 MW of demand reduction goal by 36%. It achieved its savings goals with 69 participants, indicating the program achieved higher savings per customer than anticipated. Table 147 summarizes these results.

Table 147. C&I Custom 2013 Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	31,056	63,228	204%
Demand Savings (MW)*	5.18	7.04	136%
Participation (customers)	398	69	17%
Budget	$11,332,721	$13,167,939	116%

*MWh and MW actual represent evaluated net savings and reflect the application of a 1.0849 line loss factor.

Program staff made small program design changes in 2013 based on the 2012 evaluation, including: 1) raising the cap on incentives allotted per customer from 20% of budget to 50% of budget; 2) relying more on trade allies for program outreach; and 3) initiating regular team meetings to discuss project M&V plans. Additionally, the C&I Custom Program benefited from changes made to the C&I Prescriptive Program, more comprehensive projects, and greater program awareness.

Status of 2012 Evaluation Recommendations

Table 148 lists the status of each of the C&I Custom Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed nearly all of the 2012 recommendations during the 2013 program year.

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Table 148. 2013 Status of 2012 C&I Custom Program Recommendations

2012 Recommendation	2013 Status
Consider offering higher incentives for a limited time for projects that are completed earlier in a calendar year.	*Completed (Consider/Rejected).* Program staff discussed the option of increasing incentives, but because the C&I Custom Program was on track to meet goals, program staff did not move forward with incentive changes.
Work closely with customers to plan ahead in scheduling project milestones.	*Completed.* Program staff worked more closely with customers to help them understand the M&V process. Staff met bi-weekly with the Evaluation Team, which helped streamline M&V reporting and reduce customer confusion.
Strengthen engagement opportunities with performance contractors by working with the Arkansas State Energy Office and the National Association of Energy Service Companies.	*Completed.* Staff recruited more ESCOs and contractors who offer funding, in addition to a trade ally who offers funding options to all participants and trade allies.
Reevaluate the 20% cap to determine whether it can be eliminated or increased without negatively impacting the program overall.	*Completed.* Staff raised the 20% cap to 50% for the 2013 program year.
Encourage customers to install comprehensive projects that include measures other than lighting upgrades. Present larger custom projects as part of a phased plan that includes ROI analysis so facility managers can consider the long-term possibilities for their facilities and present this information to other decision makers in the company.	*In Progress/Partial.* Implementation staff continued to encourage comprehensive projects, and more custom projects resulted from these efforts. EAI developed a new case study featuring a comprehensive project, and program staff reported that it stimulated greater interest in non-lighting measures. Program staff continue to discuss how to leverage existing incentive budgets against higher incentive bonuses.
Highlight the long-term financial benefits of installing energy-efficiency projects to customers. Develop case studies of successful projects with ROI analysis and include testimonials from satisfied participants.	*Completed.* Staff developed case studies for multiple custom projects illustrating their energy and financial benefits. Staff used trade ally training sessions to encourage trade allies to use case studies in their marketing/sales efforts. Program staff expect to develop additional case studies.
Consider either increasing the feasibility study incentive or redesigning the incentive such that it offsets a portion of the feasibility study costs upfront, and reimburses customers for the remainder of feasibility study costs after the project is installed and verified.	*Completed.* More participants opted for feasibility studies in 2013 (six) than in 2012 (2) EAI did not increase funding beyond 50% of the total project cost, but did institute a $25,000 co-funding cap per participant.
Investigate partnering with financial institutions to offer a low-interest loan for commercial energy-efficiency upgrades, or explore on-bill repayment.	*In Progress/Partial.* Program staff added a trade ally that offers project financing.
Continue to focus on a word-of-mouth, personal outreach approach.	*Completed.* EAI added account managers to the implementation team to conduct program outreach and support trade allies' outreach efforts. They leveraged multiple outreach channels such as: direct mail, cold

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2012 Recommendation	2013 Status
	calls, and free direct install of aerators and other energy-saving devices.
Given the preferences identified by some participants and nonparticipants for email or mail contact, consider introducing the program to potential customers through direct mail or emails. Then coordinate closely with account service managers to follow up by phone and email with potential program participants.	*Completed.* Trade ally and account manager outreach efforts use a combination of cold calling and mailer/phone follow-up.
Establish roles and responsibilities specifically around customer follow-up and outreach tasks to ensure that customers are not contacted repeatedly by different staff, or after they have declined participation.	*Completed.* Account managers work with implementation staff to manage outreach and follow-up with participants. Engineering staff conduct follow-up calls and respond to technical requests, informing account managers as needed. For direct install outreach, program staff refer to available customer data and uses tracking mechanisms to minimize repeated calls.
Provide program training to participating trade allies. Ensure that trade allies fully understand program rules and requirements and are able to articulate the benefits to customers.	*Completed.* Program staff assigned a coordinator to lead trade ally interactions and held regular meetings and trainings for new and returning trade allies.
Provide trade allies with program educational materials clarifying that customers can receive incentives for any measures included in CLEAResult's recommendations, and that projects can be installed in phases. EAI and CLEAResult should reinforce this message.	*Completed.* Implementation staff developed multiple fact sheets, technology one-pagers, tri-folds, and other collateral for trade ally use. The trade ally coordinator discussed these items with trade allies at trade ally training meetings.
Expand lunch-and-learn event opportunities with trade allies, customers, and other stakeholders to discuss technology options, product quality, and program processes.	*Completed.* Staff held meetings and trainings on an ongoing basis and informed trade allies about outside training or technology education options. Staff also added sales training to the trade ally lunch-and-learn offerings.
Consider hosting annual or semi-annual trade ally program training and networking events to present program rules and requirements, discuss changes and updates, gather feedback, and offer tools and assistance around customer marketing.	*Completed.* EAI held trade ally meetings to further educate existing trade allies and introduce new ones to the program. The program now has a dedicated trade ally coordinator, who manages trade ally interactions and holds regular trade ally meetings.
Leverage the current high participant satisfaction by developing case studies to illustrate the program's benefits and the possibilities for financial return. As more projects come to fruition, consider developing additional case studies for different customer segments to assist in targeted outreach efforts.	*Completed.* Staff developed a few case studies to be used in 2014.
Include guidelines in the program manual and process flow chart to identify customer engagement points and	*Completed.* EAI updated the program manual in July 2013 to include the relevant roles and responsibilities.

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2012 Recommendation	2013 Status
responsibilities concerning customer communications.	
Monitor data collection and tracking to ensure it is sufficient to support program savings calculations and EM&V efforts.	*In Progress/Partial.* The implementer performed a large quantity of data collection and measurement to support savings calculations. Much of the resulting data adequately supported savings calculations. However, we identified many projects in which the data collection period was insufficient, the data did not adequately reflect the final savings calculations, or the data did not cover all necessary information to calculate savings.
Provide all relevant data obtained for each project rather than as piecemeal submittals.	*In Progress/Partial.* Program staff held meetings with the Evaluation Team on a weekly basis in order to communicate project details. EAI discussed submitting requested project data on a continuing basis in lieu of awaiting a single request, but did not implement a formal process.

Analysis Methodology

For the C&I Custom Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[104]

- Data Collection Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
  - Implementation Trade Ally Coordinator (n=1)
- Year End Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Participant Surveys (n=11; part of the EAI combined participant surveys)[105]
- Nonparticipant Surveys (n=281 for EAI combined commercial nonparticipant surveys)[106]
- Trade ally Interviews (n=20 EAI commercial trade allies)[107]

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[104] The Evaluation Team conducted a full process evaluation of the C&I Custom Program.

[105] The Evaluation Team developed a combined commercial participant survey with core survey questions and program-specific questions for C&I Prescriptive, C&I Custom, CitySmart, and AES. Results are reported by program.

[106] The Evaluation Team developed a combined commercial nonparticipant survey, administered to 271 EAI customers, for C&I Prescriptive, C&I Custom, CitySmart, and AES. Results are reported in aggregate.

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- Site visits (n=29)
- Engineering review (n=29)
- Desk review (n=28)
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the C&I Custom Program, which consisted of a gross savings evaluation, engineering review, on-site measure verification, and NTG analysis.

The C&I Custom program exceeded its energy savings goal of 31,056 MWh by 104% and its peak coincident demand reduction goal of 5.2 MW by 36% based on net *ex post* MWh savings. Table 149 and Table 150 present these findings.

Table 149. C&I Custom Program Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
31,056	63,228	204%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 150. C&I Custom Program Demand Reduction Goal and Evaluated Net Demand Reduction

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction* (MW)	Percent of Demand Goal Achieved
5.18	7.04	136%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor.
Totals may not sum due to rounding.

Review of Program Tracking Data

The Evaluation Team relied on two tracking data sources throughout the program year: the implementer's informal tracking spreadsheet and the official tracking database extract.

We conducted monthly calls with the program implementer staff to understand the 2013 program population and determine appropriate times for on-site verification. The implementer provided regular tracking spreadsheet updates prior to those calls. We generally used this project list to track project and

[107] Because EAI qualifies trade allies to work across all commercial programs, the Evaluation Team developed and administered a combined commercial trade ally interview guide for trade allies who work in C&I Prescriptive, C&I Custom, CitySmart, and Small Business programs. Results are reported in aggregate.

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program progress and identify the most appropriate sites on which to conduct verification. This tracking spreadsheet was focused exclusively on custom projects and did not track some of the prescriptive measures. In addition, some projects listed in the tracking spreadsheet consisted of multiple activities that actually constituted multiple projects in the official tracking database extract. This made it difficult in some instances to correlate between the spreadsheets and the database.

We relied on the official tracking database extract to provide the final program population and calculate the total program reported energy and demand savings. We identified one significant error in the tracking database extract, which listed one project as costing $357,655 and saving 41 kWh, when those values actually represented the project's energy and demand savings, respectively, and the project cost (per the invoice) was $28,000.

M&V Plan Review

For projects in the C&I Custom Program, the Evaluation Team reviewed and provided written responses to 43 custom project M&V plans submitted by the program implementer. We also coordinated with the implementer to develop standard M&V protocols for compressed air leak repair projects, which included numerous Custom projects in 2013. We identified a variety of issues with energy-savings assumptions for various projects both within the M&V plans we reviewed and with the execution of M&V following approval of those plans, primarily associated with custom compressed air and industrial process measures.

Site Visits

We conducted two rounds of site visits, one in October 2013 and one in January 2014. To complete this task, the Evaluation Team required monthly tracking spreadsheet data extracts with details of the 2013 program population. We determined an appropriate sample based on the size of reported energy savings and expected uncertainty associated with specific measure types, such as compressed air and VFDs.

After selecting the sample sites within each program year, we requested project files. We collected and examined pertinent documentation regarding:

- *Conservation measure data*, such as model numbers, savings calculations and methodology, baseline condition, and appropriateness and validity of calculations.
- *Scope of data,* to identify whether all calculations, assumptions, and energy savings models were present.

While on-site, Team engineers confirmed that the measures for which the program participants received incentive payments were: (1) installed, (2) functioning, and (3) operating appropriately. If we determined an installed measure differed from the assumptions of the reported approach, we collected additional data to evaluate the energy savings.

In choosing our data-gathering techniques, we sought to balance rigor with our client's resources and budgets. We typically measure and meter where experience has shown that energy use can vary widely,

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thus increasing the uncertainty of estimates. We also usually want to take measurements for projects with uncertain or controversial savings estimates, based on available documentation. However, in this case the implementer approved the majority of projects with high levels of uncertainty at the end of the program year, and we received the final list of sites and project files in mid-January, giving us insufficient time to conduct additional metering during the final data collection phase.

Evaluated Gross Savings Analysis

The Evaluation Team analyzed savings for a sample of projects through spreadsheet calculations, metered data analysis, and desk reviews. We identified a number of adjustments to the *ex ante* savings through the steps outlined below.

Sample Estimate

The Evaluation Team selected a sample of 29 projects for site visits from the 107 program projects in 2013. Some projects featured only one measure, while others featured multiple measures. Due to the variety of custom projects, we chose to develop sample strata according to the size of energy savings and measure type, as shown in Table 151. We also conducted a desk review of all lighting and prescriptive HVAC projects in the program.

Table 151. C&I Custom Program Sample Strata

Measure	Stratum	Savings Cutoff	Total Projects	Sample Projects
Custom Non-Heating and Cooling (Compressed Air)	Large	> 4,000,000 kWh	2	2
Custom Non-Heating and Cooling (Compressed Air)	Medium	900,000 - 4,000,000 kWh	8	4
Custom Non-Heating and Cooling (Compressed Air)	Small	< 900,000 kWh	22	15
Custom Non-Heating and Cooling (Other)	Large	> 1,000,000 kWh	2	2
Custom Non-Heating and Cooling (Other)	Medium/Small	< 1,000,000 kWh	10	4
Variable Frequency Drives	None	All projects	8	2

To preserve participant anonymity, we assigned a unique identifier to each project name. The Evaluation Team used spreadsheet calculations and metered data analysis to evaluate project savings. The on-site verification results informed the evaluation analyses. Table 152 and Table 153 show the claimed (*ex ante*) and evaluated (*ex post*) energy savings and demand reductions for each project in the sample, respectively, as well as the calculated realization rates.

A realization rate (RRs) is the ratio of the *ex post* savings to the *ex ante* savings for each project.

$$RR_{ij} = \frac{Evaluated\ Savings_{ij}}{\text{Reported}\ Savings_{ij}};\ for\ project_{\ j}\ in\ stratum_{\ i}$$

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Table 152. C&I Custom Program *Ex Ante* and *Ex Post* Gross Energy Savings for Sampled Projects*

Project	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
EAC1301	82,143	82,143	100%
EAC1302	1,453,910	897,830	62%
EAC1303	577,574	577,574	100%
EAC1304	202,111	202,111	100%
EAC1305	1,082,250	945,194	87%
EAC1306	441,944	360,573	82%
EAC1307	2,047,985	2,047,985	100%
EAC1308	758,327	758,327	100%
EAC1309	643,342	551,880	86%
EAC1310	1,554,147	1,554,147	100%
EAC1311	2,636,360	2,515,603	95%
EAC1312	717,309	717,309	100%
EAC1313	4,198,038	4,203,826	100%
EAC1314	368,289	368,289	100%
EAC1315	157,227	157,227	100%
EAC1316	1,928,603	1,487,804	77%
EAC1317	806,721	806,721	100%
EAC1318	380,041	361,039	95%
EAC1319	2,505,987	2,347,557	94%
EAC1320	723,090	677,911	94%
EAC1321	991,689	181,027	18%
EAC1322	874,398	874,398	100%
EAC1323	1,012,142	1,012,142	100%
EAC1324	162,008	162,008	100%
EAC1325	5,901,329	5,015,508	85%
EAC1326	443,748	443,748	100%
EAC1327	128,789	128,789	100%
EAC1328	41	293,312	718,405%
EAC1329	85,305	85,305	100%
Total	32,864,845	29,817,286	91%

* Individual gross kWh savings for coupon measures are presented net of line loss.

Table 153. C&I Custom Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Savings for Sampled Projects*

Project	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
EAC1301	7.7	7.7	100%
EAC1302	176.6	45.8	26%
EAC1303	65.9	75.2	114%

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Project	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
EAC1304	28.0	28.0	100%
EAC1305	132.6	40.7	31%
EAC1306	97.3	47.4	49%
EAC1307	257.2	257.2	100%
EAC1308	45.0	45.0	100%
EAC1309	70.3	40.7	58%
EAC1310	207.4	207.4	100%
EAC1311	264.0	287.2	109%
EAC1312	81.9	81.9	100%
EAC1313	479.2	479.9	100%
EAC1314	82.6	82.6	100%
EAC1315	30.2	30.2	100%
EAC1316	220.2	170.3	77%
EAC1317	109.1	109.1	100%
EAC1318	43.4	43.4	100%
EAC1319	257.5	257.5	100%
EAC1320	82.5	81.5	99%
EAC1321	132.9	20.7	16%
EAC1322	70.5	71.0	101%
EAC1323	117.8	117.8	100%
EAC1324	15.9	15.9	100%
EAC1325	673.7	340.9	51%
EAC1326	87.3	87.3	100%
EAC1327	28.8	28.8	100%
EAC1328	40.8	33.6	82%
EAC1329	17.4	17.4	100%
Total	3,924	3,152	80%

* Individual gross kWh savings for coupon measures are presented net of line loss.

TRM and Desk Review

The Evaluation Team reviewed the reasonableness of TRM 3.0 formulas and inputs for prescriptive lighting and HVAC measures implemented through the C&I Custom Program. We also reviewed program application forms and invoices to compare the reported versus installed quantity of measures. We did not note any significant issues.

Engineering Analysis

The Evaluation Team's analysis of spreadsheet calculations and metered data generally revealed that the implementer's reported energy and demand savings were reasonable. However, we did identify a number of adjustments to the *ex ante* savings. Below, we outline the reasons for savings adjustment and

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their impact by project. We also note any significant findings from our review of the implementer's energy-savings calculations, methods, and data.

EAC1301

For project EAC1301, the implementer's M&V plan stated they would conduct two weeks of pre-retrofit power metering. The data showed only five days of pre-retrofit data used to establish baseline consumption, two of which were weekend days that have lower production. This data is insufficient to establish a strong correlation and determine a reasonable consumption estimate. We accepted the reported savings based on approximate trends in the available data and because of the relatively small size of the reported energy savings (82,143 kWh).

EAC1302

For this project, the participant replaced alternating current motors on 10 injection molding lines with direct current motors equipped with VFDs. The Evaluation Team reviewed the pre- and post-retrofit metering data for the entire project. The implementer metered power on a sample of the lines before and after the retrofit. Using this data, the implementer calculated the average pre- and post-intensity factor (in energy consumption per pound of production), and used that to estimate energy savings. We found that the implementer had not used metered data for all of the process lines to calculate energy savings. Table 154 and Table 155 show the pre- and post-metered results. The rows with red text were excluded from the implementer's calculations (Machines 7, 8, and 10 in the baseline cases, and Machine 5 in the retrofit case).

Table 154. EAC1302 Baseline M&V Data

Machine Number	Average Consumption (kWh)	Average Production (lbs)	Average Intensity (kWh/lb)	Average Demand (kW)
4	1,090	14,672	0.074	45.41
5	1,008	13,700	0.074	42.00
7	1,182	14,691	0.080	49.27
8	1,629	17,628	0.092	67.86
10	1,584	17,380	0.091	65.98
2	1,276	15,402	0.083	53.19

Table 155. EAC1302 Retrofit M&V Data

Machine Number	Average Consumption (kWh)	Average Production (lbs)	Average Intensity (kWh/lb)	Average Demand (kW)
1	1,620	15,457	0.105	67.48
4	1,689	15,827	0.107	70.40
5	1,421	15,968	0.089	59.21

The reported savings did not include machines with higher intensity production factors in the post data and machines with lower intensity production factors in the baseline scenario. As such, the reported

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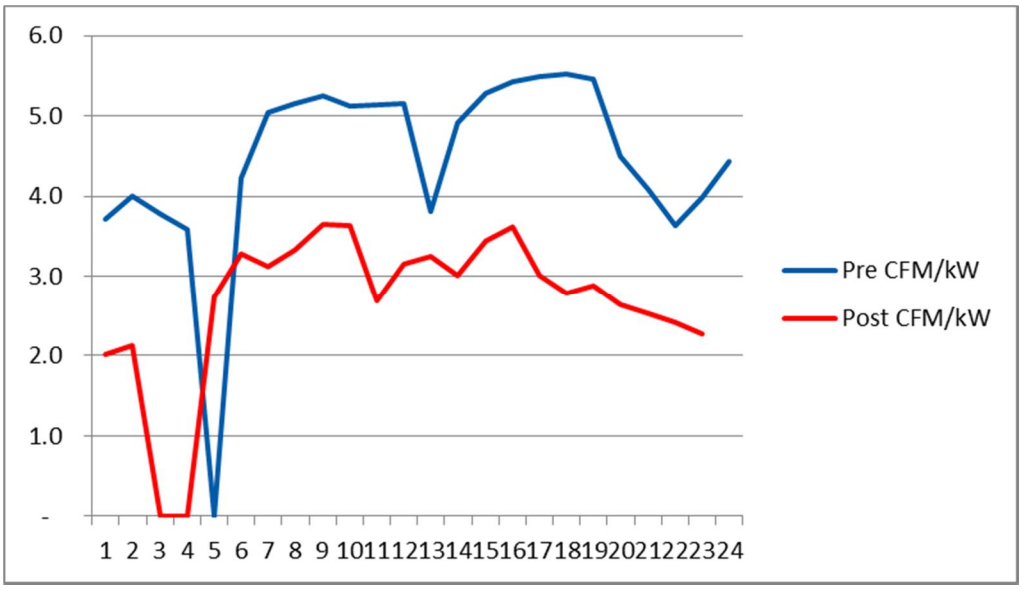
savings overestimated the baseline and underestimated the installed energy consumption. This resulted in overestimating the annual energy savings. When we included the missing data and analyzed the energy savings, the resulting realization rate was 62%.

EAC1303

For this project, we determined the measure achieved the reported energy savings through compressed air leak repairs, controls adjustments, and installation of a VFD compressor. The implementer metered power draw for each compressor for approximately six days before and seven days after implementation. This metering period is less than the two weeks pre- and 2 weeks post-retrofit outlined in the M&V plan as the minimum to adequately characterize system performance. The implementer then used the M&V data to estimate total airflow in cubic feet per minute based on the air compressor curves.

The Evaluation Team identified a significant reduction in performance in the system's specific power: a relationship between airflow and electricity requirements. This value can be represented in various ways, so we will follow the implementer's preferred method of expressing this as average cubic feet of airflow (acfm) per kW of demand. In the baseline condition, the system operated at an average value of 4.7 acfm/kW. After the leak repairs and VFD compressor installation, the system operated at an average of 2.9 acfm/kW, as shown in Figure 65.

Figure 65. EAC1303 Average Hourly Comparison of Pre- and Post-Retrofit Performance



The results indicate that the retrofit system produces a lower volume of airflow for an equivalent amount of electric input. The improvements saved the reported amount of energy, but the new compressor performs less effectively than the original system and has the potential to save even more energy. We would expect a well-functioning VFD compressor to achieve a specific power above 5 acfm/kW. The difference in specific power may be due to misaligned controls, or the new VFD

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compressor may be too small to meet the demand range for the compressed air system's requirements. This represents an opportunity for further energy savings through supply-side adjustments.

EAC1305

The participant for EAC1305 added insulation blankets to 26 injection molding heater barrels that relied on electric resistance heating. The implementer metered power draw on a sample of machines before and after the retrofit to estimate energy savings. The machine design did not provide an option for the implementer to meter on the heater circuit, so in each case they metered the power draw for the entire injection molding machine. The implementer reported the savings as the total difference between pre- and post-retrofit energy consumption.

The Evaluation Team reviewed the metering data and calculation methodology. We also obtained additional data from the participant on the amperage of the heater circuits, then compared the implementer's savings estimates as a portion of total energy consumption against a variety of other sources.[108] Based on the amperage calculations, we determined that the implementer's method overestimated the total portion of the load from the heater circuit. The data implies the participant reduced production, a portion of which was due to lower use of other machine components, such as motors and hydraulics.

The data did not allow us to isolate the impact of the reduced heating requirements, so we relied on nameplate heater power draw and an assumption about the portion of total consumption that could be saved by this measure. Our final evaluated energy savings may be overstated, but is more reasonable than the reported value. The resulting realization rate was 87%.

EAC1306

The participant for EAC1306 made adjustments to their cooling system, including the chiller, pump, and cooling tower operation. The Evaluation Team reviewed the implementer's calculations and found that, in general, they accurately represented system function. However, for the baseline pump and cooling tower calculations, they assumed the system would operate 24 hours per day, seven days per week (8,760 hours). However, the facility rarely operates on weekends, as reflected by the baseline power meter data, shown in Figure 66, that clearly shows the cooling tower and pumps being turned off on the weekends. The Evaluation Team recalculated the baseline consumption, and the resulting realization rate was 82%.

[108] For example, see the descriptive article Demystifying Energy Saving Devices on Injection Molding Machines, available online: http://plasticsengineeringblog.com/2013/08/31/demystifying-energy-saving-devices-on-injection-molding-machines/.

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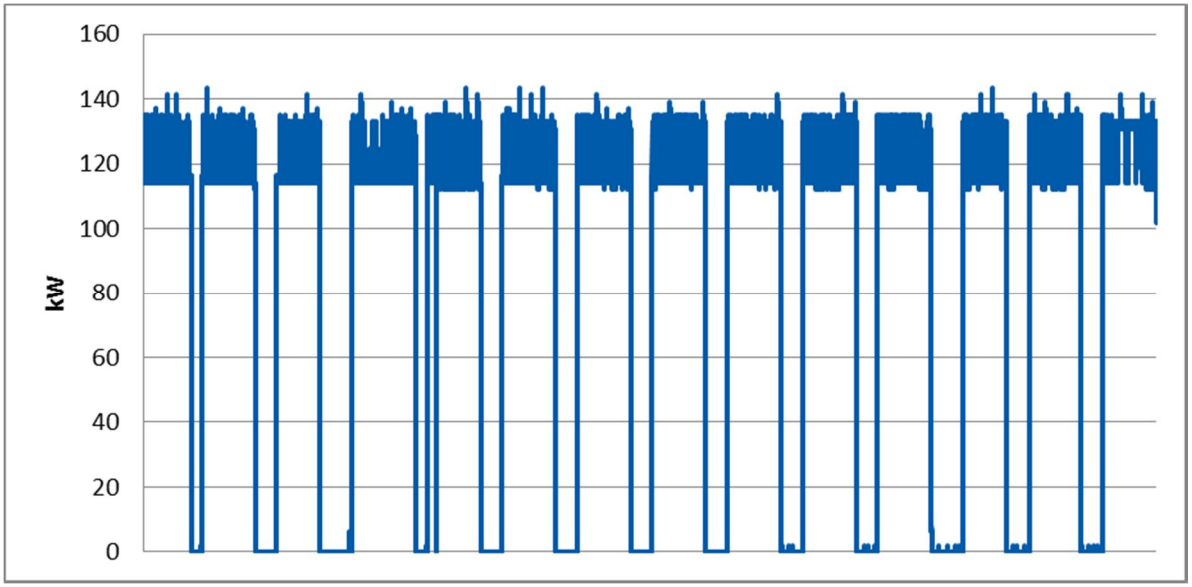
Figure 66. EAC1306 Baseline Cooling Tower and Pump Energy Consumption



EAC1307

The Evaluation Team experienced difficulty determining how the program achieved savings through project EAC1307, which represented 60% of the facility's compressed air consumption. The project's M&V report claimed the energy-savings measures occurred when the participant pursued "a demand reduction effort and adjusted their compressors' controls to reduce energy use." The contractor invoiced $52,500 (in addition to a $30,000 feasibility study co-funded by EAI) to conduct the energy-efficiency project, but the documentation did not provide any specific project details.

The Evaluation Team identified a number of anomalies in the pre- and post-retrofit metering data. The implementer estimated the compressor airflow based on the metered data from each compressor, but did not have actual airflow data for the system or the actual air demand from facility processes. The power metering data showed that the facility shut off the air compressor with the highest energy consumption (#4) in the middle of the retrofit metering period (Figure 67).

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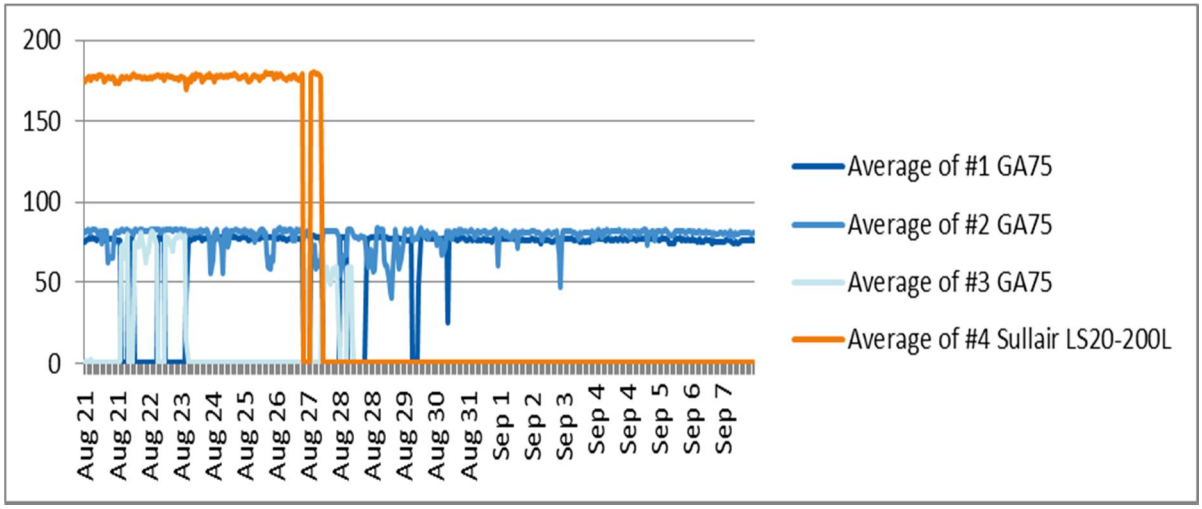
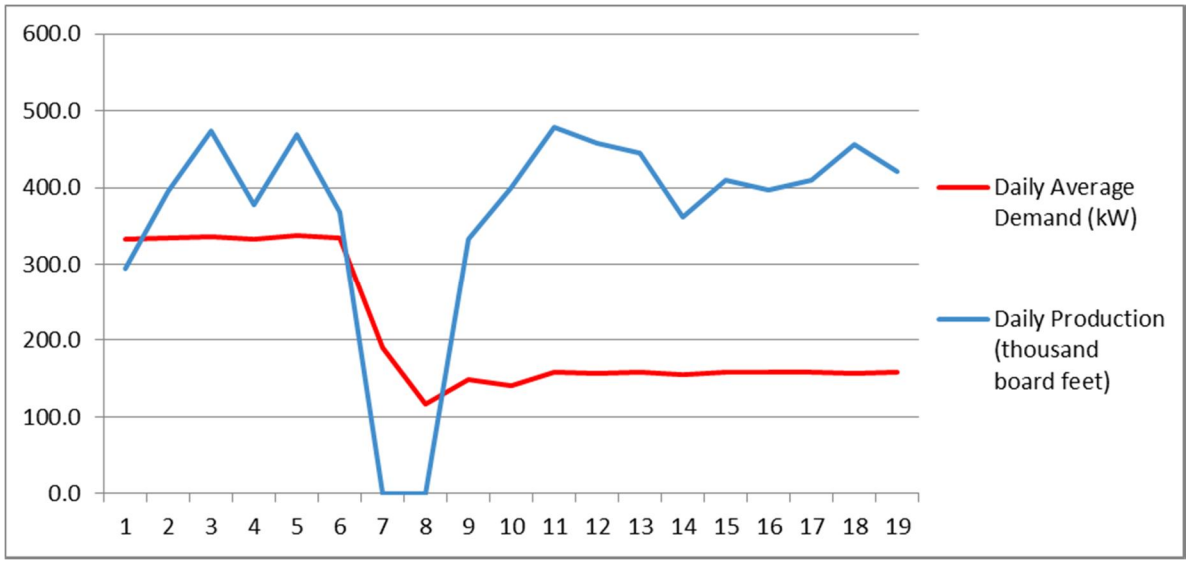
Figure 67. EAC1307 Post-Retrofit Power Metering



Despite turning off compressor #4, the participant was able to maintain their production levels in the facility, as shown in Figure 68. This implies that compressor #4 was not actually adding airflow to the system.

Figure 68. EAC1307 Post-Retrofit Total Daily Average Demand and Production



By comparing the pre- and post-retrofit metering data, the Evaluation Team determined that the compressed air contractor likely did achieve some energy savings through controls' adjustments, as well as demand reduction through leak repairs, open blow modifications, etc. However, the overwhelming majority of energy savings (77%) were achieved by simply turning off compressor #4, as shown in Table 156.

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Table 156. EAC1307 Energy Savings by Measure

Measure	Energy Savings (kWh)
Controls adjustments/demand reduction	478,186
Turn off compressor #4	1,569,799
Total	2,047,985

It's unclear why the implementer did not clearly identify the compressor #4 shutdown as the primary energy-savings measure in the documentation. Because it was likely that the C&I Custom Program had a strong influence on the customer's decision to shut down compressor #4, the Team assigned a 100% realization rate to this project.

EAC1309

For this project, the participant replaced a 200 horsepower (hp) modulated air compressor with a smaller 125 hp VFD air compressor. In both the pre- and post-retrofit case, the system also relies on another 200 hp modulated compressor to supply air. The post-retrofit metering data shows that both the 125 hp VSD and 200 hp compressors consume the same average demand, approximately 113 kW. However, a fully-loaded 200 hp compressor requires 162 kW. At 113 kW, the compressor is significantly throttled back and operating inefficiently at part load. If the system had been properly commissioned, the 200 hp would operate at 100% load (representing the full baseload), while the 125 hp VFD compressor makes up the balance between baseload and actual airflow demand.

The Evaluation Team recalculated savings using the available metering data. We determined a realization rate of 96% for this project. This project represents an opportunity to achieve additional energy savings through re-commissioning.

EAC1311

For project EAC1311, the participant conducted a significant leak reduction effort. The Evaluation Team reviewed the metering data and determined that the energy savings had been overestimated by 120,757 kWh. After recalculating energy savings, the resulting realization rate was 95%.

EAC1312

The participant for this project did not install new equipment, but rather transferred a refiner (equipment that grinds wood chips) from another facility and refurbished it. The Evaluation Team reviewed the calculations and data, and determined the energy savings were reasonable. However, the implementer claimed a 20-year measure life for this project, without regard for the actual age of the existing equipment. While 20 years is an acceptable effective useful life for new equipment, it is likely not appropriate for refurbished existing equipment. Without any data on the actual equipment age, we would generally expect to see a measure life of eight to 10 years for this type of project and equipment.

EAC1316

For this project, the participant replaced the output of several air compressors with one VFD compressor and repaired air leaks. On other compressed air projects, the implementer typically calculated energy

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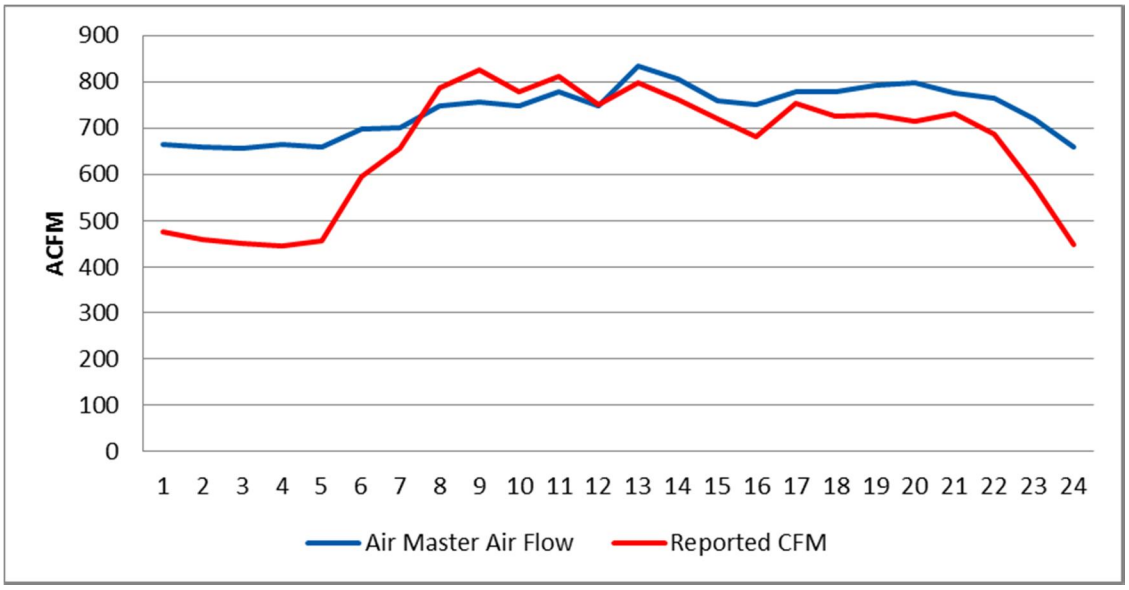
savings using pre- and post-retrofit metering data, without regard to changes in production or airflow rates. On project EAC1316, the participant added new production equipment and increased the facility's airflow requirements, which necessitated a different savings methodology.

The implementer estimated energy savings by creating flow bins with specific pre- and post-retrofit power to estimate efficiency gains. The specific power is the relationship between airflow rate (acfm) and demand (kW). However, the implementer did not directly meter the airflow rate, instead estimating it based on the manufacturer's data.

The Evaluation Team determined that the implementer's methodology did not accurately reflect the likely system operation. We estimated system performance using AirMaster+ software[109] from the United States Department of Energy, which makes it possible to characterize baseline operation and model future energy-savings improvements. Using available site information and power metering data, the AirMaster+ outputs produced different average hourly flow estimates than the implementer estimated, as shown in Figure 69.

Figure 69. EAC1316 Baseline Airflow – Reported Values vs. AirMaster+



The AirMaster+ data better characterizes the baseline system performance. We adjusted the modeled AirMaster+ system to reflect the equipment and operational changes in the retrofit case. This resulted in higher energy savings than were reported for this portion of the measure.

The project also involved two leak survey and repair efforts. The contractor reportedly identified 350 cfm in leaks during each survey (for a total of 700 cfm) and repaired 590 cfm of leaks. The implementer estimated an average baseline of 659 cfm, a quantity which exceeds the available capacity of the

[109] http://www1.eere.energy.gov/manufacturing/tech_assistance/software_airmaster.html

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system. If 590 cfm of leaks were actually repaired, that would indicate 90% of the total airflow leaked out of the system prior to repair, with only 10% used for production. The Evaluation Team considers these leakage values to be highly implausible. We note that most sources[110] estimate that a poorly-maintained system will lose up to 30% of its airflow output to leakage. A well-developed leak repair initiative should bring the loss down to 5-10% of airflow. Using this information, the Evaluation Team assumed this project was able to identify and repair leaks equivalent to 30% of the average post-retrofit airflow of of 1,027 cfm (the participant added 17 new pieces of equipment which increased overall plant air demand). This adjustment reduced the energy savings considerably. The resulting realization rate was 77%.

EAC1318

This project was a leak survey and repair effort. The Evaluation Team reviewed the findings and determined the reported leaks and savings methodology were mostly reasonable. The calculations assumed the compressed air equipment operated 8,760 hours per year; however, the participant said the facility is shut down roughly 5% of the time throughout the year. We adjusted the operating hours accordingly. The resulting realization rate was 95%.

The implementer also reported a measure life of 10 years for this leak repair project. They list a measure life of five years for most other leak repair projects. Various studies[111] assume a five-year measure life for a custom operations and maintenance measure, which is reasonable even though the constant vibration and pressure impacts from air compressors may reduce the effective useful life of leak repairs below five years.

EAC1319

For this project's calculations, the implementer assumed the compressed air equipment operated 8,760 hours per year. However, the participant reported that the facility experiences some down time throughout the course of the year. We adjusted the operating hours accordingly, and the resulting realization rate was 94%.

EAC1320

A participant conducted this project at the same facility as EAC1319. As with that project, the calculations assumed the compressed air equipment operated 8,760 hours per year. However, the participant reported the facility experiences some down time throughout the course of the year, so we adjusted the operating hours accordingly. The resulting realization rate was 94%.

For this project, the participant adjusted the flow settings on an existing fan to reduce excess air in the baseline system. As part of the project, new sheaves and belts were installed on a fan that is driven by a 200 hp backup motor. This allowed the site to take one 300 hp blower offline. The Evaluation Team

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110 For example, http://www.energystar.gov/ia/business/industry/compressed_air3.pdf

111 http://rtf.nwcouncil.org/subcommittees/nonreslighting/Measure%20Life%20Study_MA%20Joint%20Utilities_2005_ERS-1.pdf

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reviewed the calculations and data, and determined the energy savings were reasonable; however, the implementer claimed a 20-year measure life for this project, without regard for the actual age of the existing equipment. While 20 years is an acceptable effective useful life for new fan-based equipment, it is likely not appropriate for an operations and maintenance measure. Without any data on the actual equipment age, we would generally expect to see a measure life of eight to 10 years for this type of project.

EAC1321

This project represented Phase 2 of a series of compressed air projects and involved repairing leaks and testing and replacing open blows. We reviewed the baseline and retrofit metering data for this phase and found that the system operated less efficiently midway through the post-repair metering period, reportedly after the adjustments had been made to the system. The average specific power declined from 5.19 cfm/kW to 4.21 cfm/kW, as shown in Figure 70 and Figure 71.

Figure 70. EAC1321 Baseline Specific Power (cfm/kW)

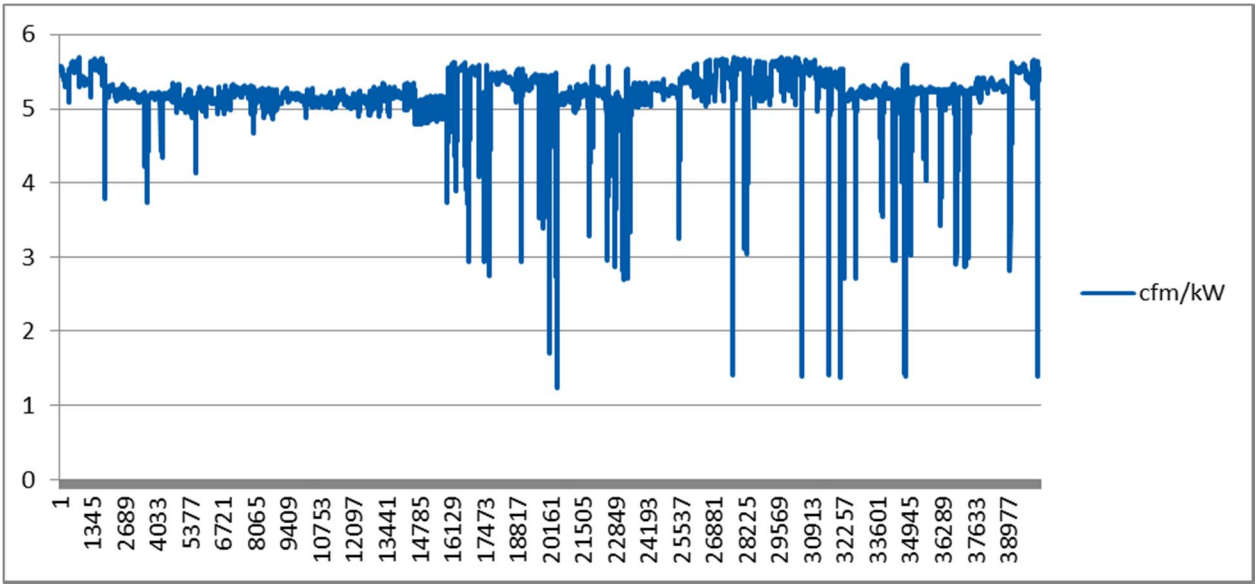

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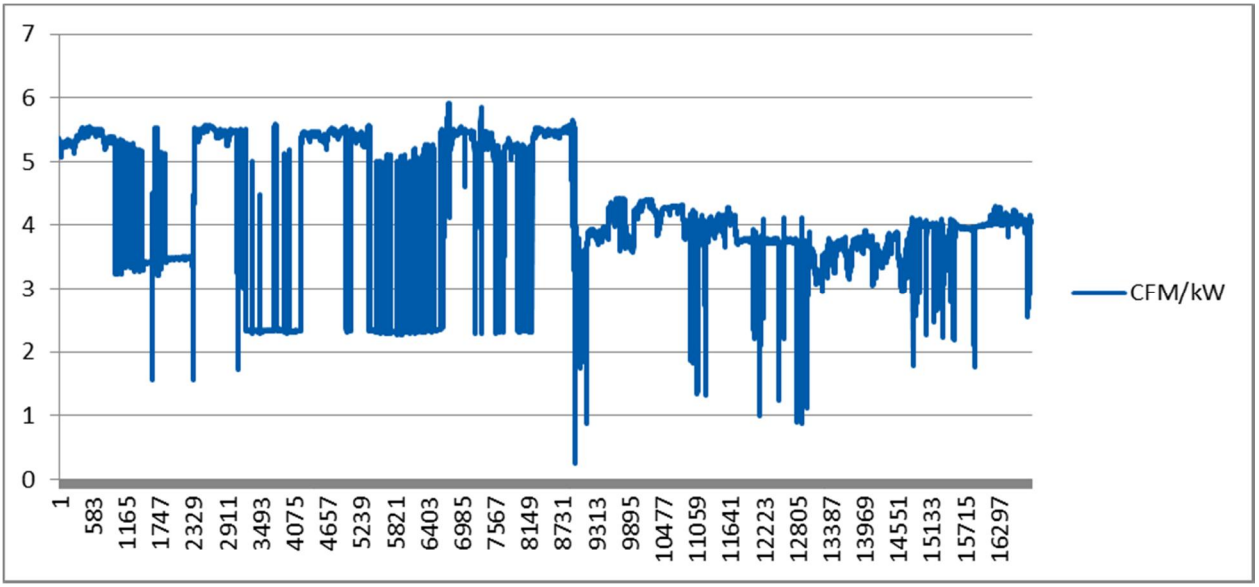
Figure 71. EAC1321 Retrofit Specific Power (cfm/kW)



The facility's production declined by 30% between the baseline and retrofit metering periods. To compensate, the implementer used an engineering model based on reported leak repair cfm and estimated airflow to determine the reported savings. However, the implementer's M&V plan provided an option for energy-savings estimates that account for the relationship between production and air demand. The Evaluation Team determined that model would have been most appropriate to evaluate energy savings in this instance, based on the drop in production and decline in system operating efficiency in the retrofit period. The evaluation methodology reduced energy savings considerably, and the resulting realization rate was 18%.

EAC1325

This project was a new construction compressed air system, and reported the highest energy savings of any project ever incented through the C&I Custom Program. The baseline represented an initial design the participant considered with individual compressed air systems for each area of the facility. The baseline system also assumed the participant would install heatless desiccant air dryers that would purge a constant volume of compressed air while in operation. The M&V plan claimed the implementer would conduct two weeks of post-construction power and airflow metering to accurately assess system performance. The plan also assumed that part of the facility, designated as Area 600, would only operate 50% of the time. The implementer estimated that portion of the plant would require 42% of the facility's compressed air demand.

The Evaluation Team reviewed the metering data and analysis methodology and found various inconsistencies. The implementer only performed metering for six full days of post-construction operation, compared to the two week minimum outlined in the M&V plan. Any changes a longer metering period would have made are expounded by this being a large project; it reported 9,501,329

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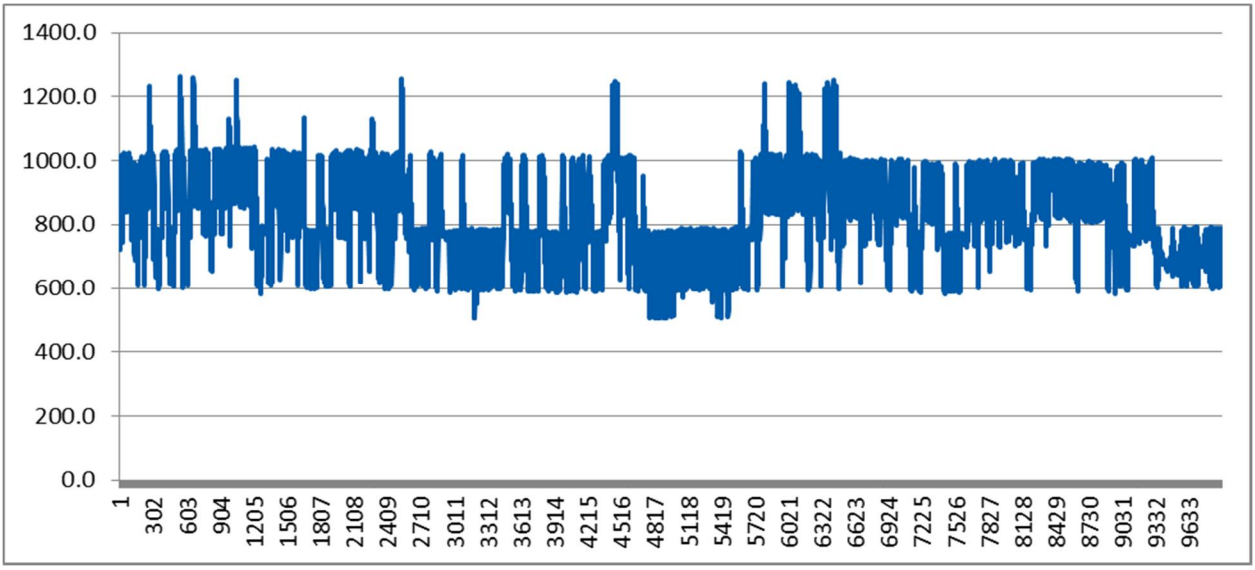
kWh of energy savings (split over 2012 and 2013). We have little expectation that the six days of metering reflects the actual operation of the system over the course of a year.

In addition, the implementer calculated energy savings with the assumption that the Area 600 air dryers would operate constantly, contrary to the initial assumption of 50% runtime outlined in the M&V plan. The implementer's rationale for the adjustment was that they did not believe the participant would have the capability to turn the dryers off and on as needed. The Evaluation Team interviewed the participant regarding Area 600 operation, who confirmed that this portion of the facility only operates for six to 12 hours per day, on average. This one major function of this area is to load railcars with processed material. The participant provided a log of railcar loadings during the M&V period. The number of loadings per day roughly corresponded to daily fluctuations in energy consumption. Those fluctuations in consumption are shown in Figure 72 and indicate the facility has a dynamic system that does not operate constantly at the same level.

Figure 72. EAC1325 Post-Construction Power Metering Data in kW



Based on our engineering judgment and interviews with the participant, we determined it was likely the facility would have installed controls enabling them to shut down the air dryers when Area 600 did not require compressed air. This reflects the original intent of the implementer's M&V plan. We adjusted the energy-savings calculations accordingly, which reduced the energy savings. The adjustment resulted in a realization rate of 85%.

EAC1328

The program database extract incorrectly reported 41 kWh for this project's energy savings, which was actually the demand savings. For our portfolio analyses of savings and cost-effectiveness, the Team relied on the database extract values for sampled and non-sampled sites, so we did not adjust the *ex ante* savings to reflect the actual value.

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The implementer's project documentation reported *ex ante* savings of 357,655 kWh. The project involved two rounds of leak surveys and repair, and the implementer conducted only pre-repair power metering. During the program year, the implementer presented their proposed methodology to calculate savings for this type of project without post-repair metering. The Evaluation Team expressed concerns with the proposed methodology and requested post-repair metering to confirm that the methodology achieved realistic results.

The implementer estimated airflow based on the compressor curves relative to the metered power consumption. The first round of repairs claimed to fix 72 cfm of air leaks, equal to 14% of the average estimated airflow. The contractor conducted another leak survey three weeks later and claimed to repair another 140 cfm of leaks. The total estimated leakage was equivalent to 41% of the total estimated airflow. This falls outside the range of reasonable values, as noted previously for EAC1316.

In general, leak repairs are most effective and save more energy in the context of a comprehensive compressed air project that also reduces system pressure and adjusts controls in concert with leakage reductions. The implementer did not conduct post-repair power metering to confirm whether the power demand actually declined as a result of the leak repairs, but instead relied on a speculative bin analysis based on assumptions for flow and power reduction.

The Evaluation Team did not consider the reported methodology to be appropriate, particularly without the support of any post-repair metering data. We applied the same adjustment as with EAC1316, in which we assumed it is possible the contractor was able to identify and repair leaks equal to 30% of the estimated airflow. This resulted in a realization rate of 82% relative to the implementer's *ex ante* savings. However, the database extract reported only 41 kWh, so the final evaluated savings resulted in a realization rate of 718,405%.

Extrapolation to Program Population and Uncertainty

Stratum-Specific *Ex Post* Electricity Savings

The Evaluation Team calculated *ex post* savings for each measure type and stratum—census, medium, and small—by applying the realization rate for the sampled projects within each measure type and stratum to the *ex ante* savings for the entire measure type and stratum. The realization rate (RR) for each measure type and stratum is calculated as the ratio of the sum of the *ex post* savings to the sum of the *ex ante* savings for the sampled projects within that measure type and stratum:

$$RR_i = \frac{\sum_j EvaluatedSavings_{ij}}{\sum_j Reported\ Savings_{ij}};\ for\ stratum\ i\ across\ all\ sampled\ projects$$

Table 157 and Table 158 show the sampled *ex ante* savings, *ex post* savings, and realization rate for each measure type and stratum.

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Table 157. C&I Custom Program Electricity Savings Stratum Specific Results

Measure	Stratum	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
Custom Non-Heating and Cooling (Compressed Air)	Large	10,099,367	9,219,334	91%
Custom Non-Heating and Cooling (Compressed Air)	Medium	12,466,575	11,548,464	93%
Custom Non-Heating and Cooling (Compressed Air)	Small	12,159,464	10,661,244	88%
Custom Non-Heating and Cooling (Other)	Large	2,536,160	1,843,024	73%
Custom Non-Heating and Cooling (Other)	Medium/Small	3,775,532	3,563,240	94%
Variable Frequency Drives	None	5,500,675	5,342,246	97%

Table 158. C&I Custom Program Coincident Peak Demand Reduction Stratum Specific Results

Measure	Stratum	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
Custom Non-Heating and Cooling (Compressed Air)	Large	1,152.9	820.8	71%
Custom Non-Heating and Cooling (Compressed Air)	Medium	1,310.0	1,269.4	97%
Custom Non-Heating and Cooling (Compressed Air)	Small	1,460.4	1,201.2	82%
Custom Non-Heating and Cooling (Other)	Large	309.2	86.5	28%
Custom Non-Heating and Cooling (Other)	Medium/Small	512.0	451.6	88%
Variable Frequency Drives	None	634.7	634.7	100%

Total Program *Ex Post* Electricity Savings

The total *ex post* savings for each measure type and stratum combination is the product of the realization rate for the combination and the total *ex ante* savings for the combination, assuming that our estimated realization rate for the stratum can be applied across all projects in the measure type and stratum combination.

$$Evaluated\ Savings_i = RR_i \times \sum_j Reported\ Savings_j;\ for\ all\ \ projects\ in\ stratum\ i$$

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The total *ex post* savings for the program is the sum of the *ex post* savings for each measure type and stratum.

$$Evaluated\,Program\,Savings = \sum_i Evaluated\,Savings_i$$

The program realization rate is the quotient of the *ex post* program savings to the *ex ante* program savings.

$$RR_{Program} = \frac{Evaluated\,Program\,Savings}{Reported\,Program\,Savings};\ for\,the\,population$$

Table 159 shows the calculation of the total *ex post* savings for each measure type and for the program, along with the overall program realization rate. The final results include a variety of measures, such as lighting and HVAC equipment, for which we performed a desk review and did not identify any problems. The results also include several incomplete projects which reported 40% of their savings in 2013 and will complete in 2014.

Table 159. C&I Custom Program Total *Ex Ante* and *Ex Post* Savings

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)
Custom Control	889,983	889,983	127.9	127.9
Custom HVAC	1,175,692	1,175,692	146.3	146.3
Unitary AC	3,713	3,713	1.5	1.5
Water Chilling Equipment	80,562	80,562	32.7	32.7
CFL	3,047	3,047	0.2	0.2
HID	134,815	134,815	11.1	11.1
LED	1,602,262	1,602,262	148.4	148.4
Lighting Control	900,545	900,545	123.4	123.4
Linear Fluorescent	6,246,347	6,246,347	812.2	812.2
New Construction Lighting	5,905,884	5,905,884	719.1	719.1
Premium Efficiency Motor	89,702	89,702	10.2	10.2
Variable Frequency Drive	5,500,675	5,342,246	634.7	634.7
Custom Other	45,032,153	40,979	5,226.2	4,285.4
Total	67,565,380	63,347,465	7,994.0	7,053.3
Realization Rate		94%		88%

Net-to-Gross Analysis

The Evaluation Team calculated two distinct freeridership rates for the C&I Custom Program, one for participants and one for contractors, following the analysis methodology outlined in the Methodology section of this report. Details specific to the C&I Custom Program are outlined below.

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Freeridership

As some customers installed more than one program measure, the Team assessed participant freeridership at the measure level rather than at the participant level. We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had pre-existing plans to purchase or install the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without the program they would have installed a program-eligible measure of the same (or higher) efficiency within a year.

Table 160 shows the survey questions we used to assess freeridership for each criterion. We then used the three freeridership criteria scores to determine overall program freeridership.

Table 160. C&I Custom Program Participant Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans for Measure Installation	Before learning about the Entergy C&I Custom Program, was your organization already planning to purchase and install the measure in 2013?*
Available Budget	If the program incentive had not been available, how likely is it that your 2013 budget would have included the full cost of the measure?*
Stated Intent	Without the incentive, would you have purchased a measure that had the same level of efficiency, higher efficiency, or lower efficiency?
	Without the incentive, would you have purchased the measure....[sooner, at the same time, later in the same year, in one or two years, etc.]?

* The Team varied wording question slightly depending on the number of measures installed by the contractor.

The Evaluation Team asked seven participants about 15 measures they installed through the program.[112] We identified measures as freerider measures if they simultaneously met all three criteria. Responses indicated that there were no freeriders for any of the measures. Accordingly, the *unweighted unadjusted* participant freeridership rate is estimated to be 0%, as shown in Table 161.

[112] We interviewed four additional respondents about 33 additional measures, but these measures could not be confirmed in the tracking database.

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Table 161. C&I Custom Program Unweighted Unadjusted Participant Freeridership Rate

Freeridership Criteria	Unweighted Percent of Measures that Met Criteria (n=15)*
Prior Plans for Measure Installation	0%
Available Budget	13%
Stated Intent	0%
Unadjusted, Unweighted Freeridership Rate	0%

Contractor Freeridership

The Evaluation Team interviewed eight trade allies to estimate the overall freeridership rate for the EAI commercial programs.[113] As these contractors had worked across multiple EAI programs, it was not possible to determine freeridership on a program level.

We determined the contractor freeridership rate by examining each contractor's responses to a question that measured the program influence on their installation of high-efficiency equipment and services. We asked respondents who indicated in a previous question that their sales of a particular program-supported measure would have been lower in the absence of the program, "By what percentage do you estimate your number of jobs from the measure would be lower if the program had not been available?" We then calculated the number of freerider jobs (jobs that would have happened in the absence of the program) for each contractor by subtracting the reported percentage from 100% and multiplying the resulting percentage by the total number of that contractor's jobs through EAI programs in the past year.

In total, the eight contractors reported installing or performing 163 program supported jobs, 22 of which were freerider jobs. The resulting contractor freeridership rate, unweighted by the measure savings associated with the jobs, was 13%.

Adjusted Freeridership

The Evaluation Team applied the unweighted contractor freeridership rate to participants who reported that the contractor or equipment supplier was important in their decision to purchase and install program measures. We determined contractor importance using survey questions asking about the importance of: 1) advice from the equipment supplier or contractor, and 2) the energy assessment report (Table 162). If respondents indicated that both of these factors were very important in their installation decisions, we considered their contractors/equipment suppliers to be important in their decision to purchase and install program measures.

[113] The Evaluation Team interviewed 16 EAI contractors, but only eight gave valid freeridership estimates.

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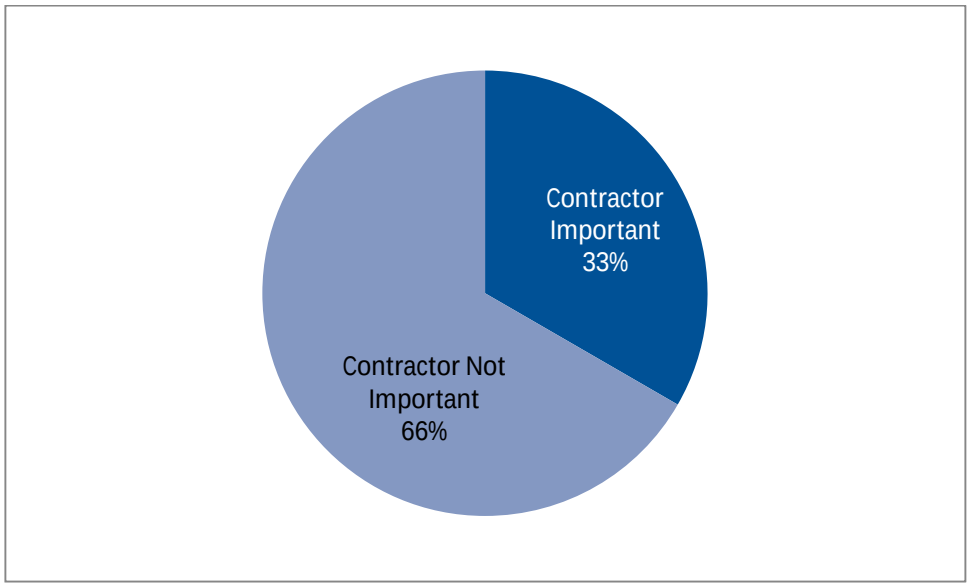
Table 162. C&I Custom Program Participant Contractor Importance Questions

Survey Question Wording	Response Categories
In general, how important was advice from your equipment supplier or installation contractor in your decision to purchase the equipment that you installed through the program(s)?	Very Important Somewhat Important Not Very Important Not at all Important
In general, how important was the energy assessment done by your contractor or program staff in your decision to purchase the equipment you installed through the program(s)?	

Participants indicated that the contractor was important in their decisions to install five (33%) of the 15 measures they were asked about (Figure 73). For these measures, we substituted the contractor freeridership estimate for the freeridership rate previously calculated according to the participants' responses to the freeridership questions.

Figure 73. C&I Custom Program Contractor Importance



Multiple survey questions; see Appendix A (n=15 measures; seven respondents).

Participants deemed the contractor to be important for 33% of the 15 measures, but none of these measures were freerider measures according to participants' responses. As a result, while the overall unadjusted participant freeridership rate was 0%, after applying the unweighted contractor freeridership rate of 13% to the five measures for which the contractor was important, the *adjusted unweighted* participant freeridership rate was 4% (Table 163).

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Table 163. C&I Custom Participant Unweighted Adjusted Freeridership Rates by Contractor Importance

Contractor Importance	Number of Measures	% of Measures	Freeridership Rate Type	End-User Estimated, Unadjusted Freeridership Rate	Adjusted Freeridership Rate
Contractor was not important	10	66%	Unadjusted participant	0%	0%
Contractor was important	5	33%	Contractor	0%	13%
All	15	100%	Overall participant	0%	4%

Weighted Freeridership

To account for the different savings values associated with each of the installed measures, the Evaluation Team weighted the freeridership results by the program savings for each measure to estimate the final freeridership rate.

The unweighted contractor freeridership rate of 13% changed to 17% when we weighted the results by the savings associated with the measures installed by the contractors. As the participants' *unadjusted, unweighted* freeridership rate was 0%, weighting by savings made no difference--the *unadjusted weighted* freeridership rate was therefore also 0%.

To estimate unadjusted weighted net savings, the Evaluation Team derived the NTG of 100% (100% minus the freeridership rate) and applied it to the gross savings associated with the 15 measures installed by respondents. However, if a contractor was determined to be important to the participant's decision to install the specific measure, we applied the weighted contractor freeridership rate of 17% to that measure's savings. After applying the weighted contractor freeridership rate, the ratio of the sum of net savings to gross savings resulted in an *adjusted weighted* freeridership rate of 8%. Table 164 shows the gross and net savings corresponding with these adjusted freeridership ratings.

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Table 164. C&I Custom Participant Weighted Unadjusted and Adjusted Freeridership Rate

Stratum	Total Measures	Gross Savings (kWh)	Unadjusted Net Savings		Adjusted Net Savings*	
			% Assigned	Net Savings (kWh)	% Assigned	Net Savings (kWh)
Contractor Important - Non Freerider	5	3,566,608	100%	3,566,608	83%	2,960,285
Contractor Unimportant - Non Freerider	10	3,582,536	100%	3,582,536	100%	3,582,536
Contractor Important - Freerider	0	0	0%	0	83%	0
Contractor Unimportant – Freerider	0	0	0%	0	0%	0
Total	15	7,149,144		100%		6,542,821
Weighted Freeridership						8%

* We assigned a weighted contractor freeridership rate of 17% to measures for which the contractor was important.

Spillover

The Evaluation Team quantified like-spillover, which is equipment installed outside of the program that is exactly the same type and efficiency as the equipment available through EAI programs, where the participant's experience with the program was important to their decision to implement the measures. The following criteria are required for a measure to be considered spillover:

- The service or measure is offered in the program portfolio;
- The customer did not receive a rebate or incentive for the measure;
- The customer's or contractor's experience with the program was somewhat or very important in the decision to install the measure.[114]

The analysis from participant surveys and contractor interviews revealed that there was no like-spillover among program measures. One participant reported non-like program spillover for their efforts to encourage staff members to take energy-saving actions.

The Evaluation Team surveyed nonparticipants to determine if there was spillover among this group. We found no evidence of spillover among nonparticipants.

[114] The Evaluation Team asked respondents to identify the extent to which the program influenced their non-program sales (contractors) and non-program purchases (participants) using a scale of very important, somewhat important, not very important, or not at all important.

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Net-to-Gross

Table 165 presents the NTG ratio for C&I Custom Program customers.

Table 165. Net-to-Gross Ratio Values and Calculation

Parameter	Value
Weighted Freeridership Rate	0.08
Spillover	0.00
Net-to-Gross Ratio *(1 - Adjusted Freeridership + Spillover)*	0.92

Evaluated Net Savings

The final evaluated net savings for the C&I Custom Program are shown in Table 166. Applying the 0.92 NTG ratio to *ex post* gross savings results in *ex post* net energy savings of 58,148,745 kWh and coincident peak demand reduction of 5,991.6 kW. The values shown are presented net of line loss.

Table 166. Evaluated Net Savings*

Savings	Evaluated Gross Savings	Net Savings	Net-to-Gross Ratio
Coincident Peak Demand Savings (kW)	6,512.6	5,991.6	0.92
Annual Energy Savings (kWh)	63,205,158	58,148,745	0.92

* Savings are presented net of line losses.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Program Design

The C&I Custom Program benefitted from changes made to the C&I Prescriptive Program.

Program staff reported that changes made to the C&I Prescriptive Program incentives in 2013 encouraged more C&I Custom Program participation. Specifically, EAI increased the C&I Prescriptive Program incentive from $0.09/kWh to $0.15/kWh, and permitted prescriptive measures to be bundled with custom measures to access the C&I Custom Program's tiered incentive structure. Therefore, many participants who started in the C&I Prescriptive Program became interested in more comprehensive projects with higher incentives that fell under the CI& Custom Program. Because of this programmatic synergy, program staff proposed and received approval from the APSC to combine the prescriptive and custom programs in 2014. EAI's decision reflects a growing trend across the country to combine prescriptive and custom programs to reduce customer confusion and streamline program processes.

Projects represent a wider range of installed measures in 2013.

Program and implementation staff reported that customers expressed more interest in non-lighting measures in 2013 than in previous program years. Program and implementation staff recruited two dozen new trade allies with diverse specialties in 2013; one of the most active of this group specializes in

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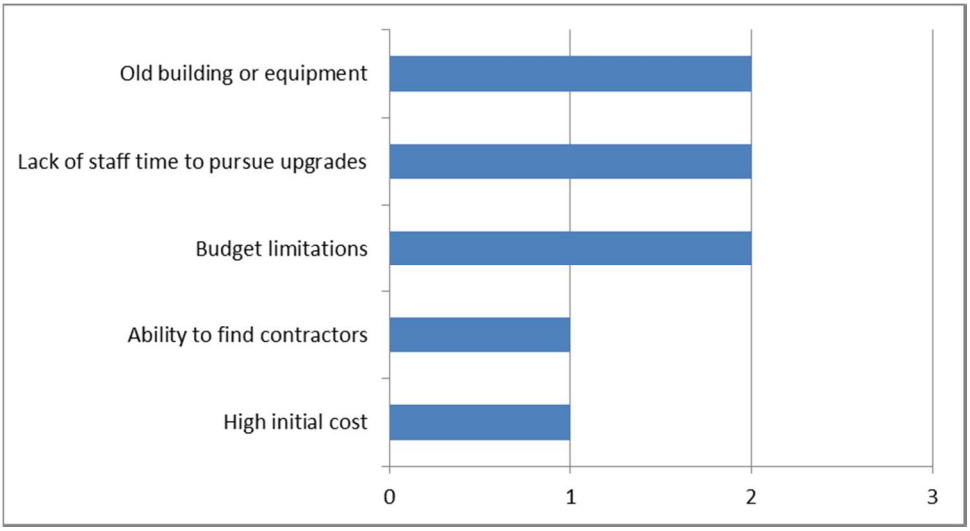
air compression. In addition, survey findings confirmed that a significant number of returning customers (eight of 11 participant respondents) sought to install measures other than lighting.

Customers continue to face a variety of challenges when pursuing energy-efficiency upgrades.

Five of 11 participants said they faced a variety of challenges when making energy-efficiency upgrades to their facilities. Two of these five said that budget limitations posed a challenge. Participants also noted that they lacked the time to pursue upgrades (two of five), to find contractors (one of five), and/or thought they would be limited by their facility or equipment age (two of five). Only one of five respondents said that high initial cost was a barrier, in contrast to three of four who said cost was a barrier in 2012. Figure 74 illustrates the participants' responses.

Figure 74. Participant Challenges in Making Energy-Efficiency Upgrades



Q21. Can you tell me what these challenges are? [Multiple responses allowed; respondents asked only if they said they faced challenges in making energy-efficiency upgrades in their facilities] (n=5)

All 11 participant respondents reported that the incentive amount was very important in their decision to install equipment through the program. This response is consistent with the Evaluation Team's 2012 findings, in which all six participants emphasized the importance of incentives to their upgrade decision. However, utility and implementation staff noted that customers have been more willing to consider measures with longer payback periods in 2013.

Marketing and Outreach

Customers are more aware of EAI's overall commercial programs than they were in 2012, but not many are familiar with the C&I Custom Program.

Forty percent of nonparticipants said they know EAI offers programs to help C&I customers save energy and money, compared to 32% in 2012. Of those 2013 respondents who noted awareness, 13% had heard of C&I Custom, a slight increase from 2012 (11%). Figure 75 shows nonparticipant awareness of EAI's commercial programs.

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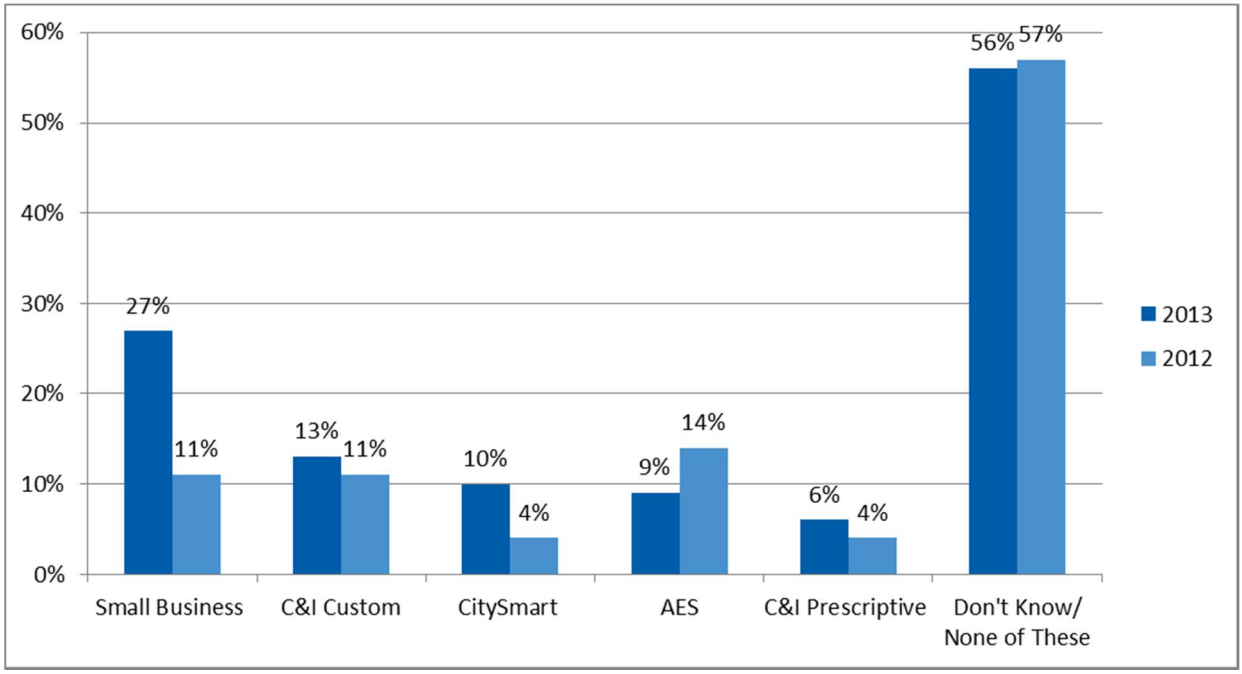
Figure 75. Nonparticipant Program Awareness, 2012-2013



Q6A (2013) and Q5A (2012). Which of the programs were you aware of? [Multiple responses allowed] (n=110, 2013; n=28, 2012)

An emphasis on trade ally direct outreach played an important role in program awareness.

EAI customer service representatives worked in concert with program and implementation staff to identify eligible customers and introduce the program to customers who have an existing relationship with an EAI customer service representative. Customer service representatives have served an important outreach function for the program, in addition to being a consistent point of contact for customers with EAI commercial accounts. EAI plans to eliminate the customer service representative positions for commercial accounts in 2014. Program staff noted that the loss of this position will require EAI to change the C&I Custom Program outreach strategy; emphasizing trade allies as program ambassadors is one way in which they are preparing for this change.

To prepare for the loss of EAI customer service representatives in 2014, in 2013 program and implementation staff relied more on trade allies to make connections with potential customers. Implementation staff focused their trade ally outreach efforts on training existing trade allies, although they did recruit several new trade allies to the program. They offered in-person and webinar training to help trade allies with sales and technical skill development, and hired a new person as the dedicated trade ally coordinator for all EAI commercial programs. EAI also supported trade ally outreach efforts to promote the program through fact sheets, brochures, case studies, and word-of-mouth; once trade allies provided leads, implementation staff followed up to vet projects. EAI focused its trade ally recruitment efforts on those companies what serve a wide area and therefore many EAI customers.

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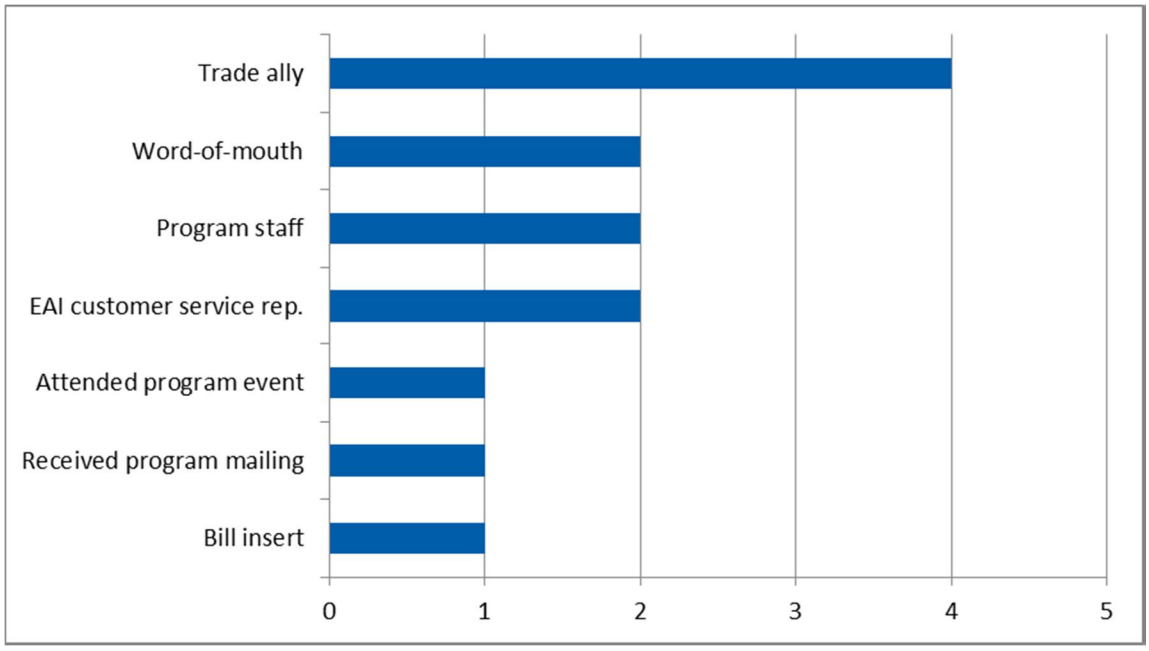
Figure 76 indicates that the emphasis on trade ally outreach has already had a positive effect. Four of 11 participants noted that they first heard about the C&I Custom Program through a trade ally, compared to the one 2012 participant who mentioned trade allies. Survey findings confirm that word-of-mouth, program and implementation staff, and customer service representatives also played an important outreach role.

Figure 76. Participant Source of Program Awareness



Q9. In what ways have you heard about Entergy's C&I Custom Program? [Multiple responses allowed] (n=11)

Nonparticipants reported learning about EAI's programs in many of the same ways participants did (see Figure 77); however, nonparticipants cited program mailings and bill inserts with greater frequency. Survey findings also showed that word-of-mouth played a bigger role in 2013 than in 2012, with 20% of nonparticipant respondents mentioning it as a source of awareness.

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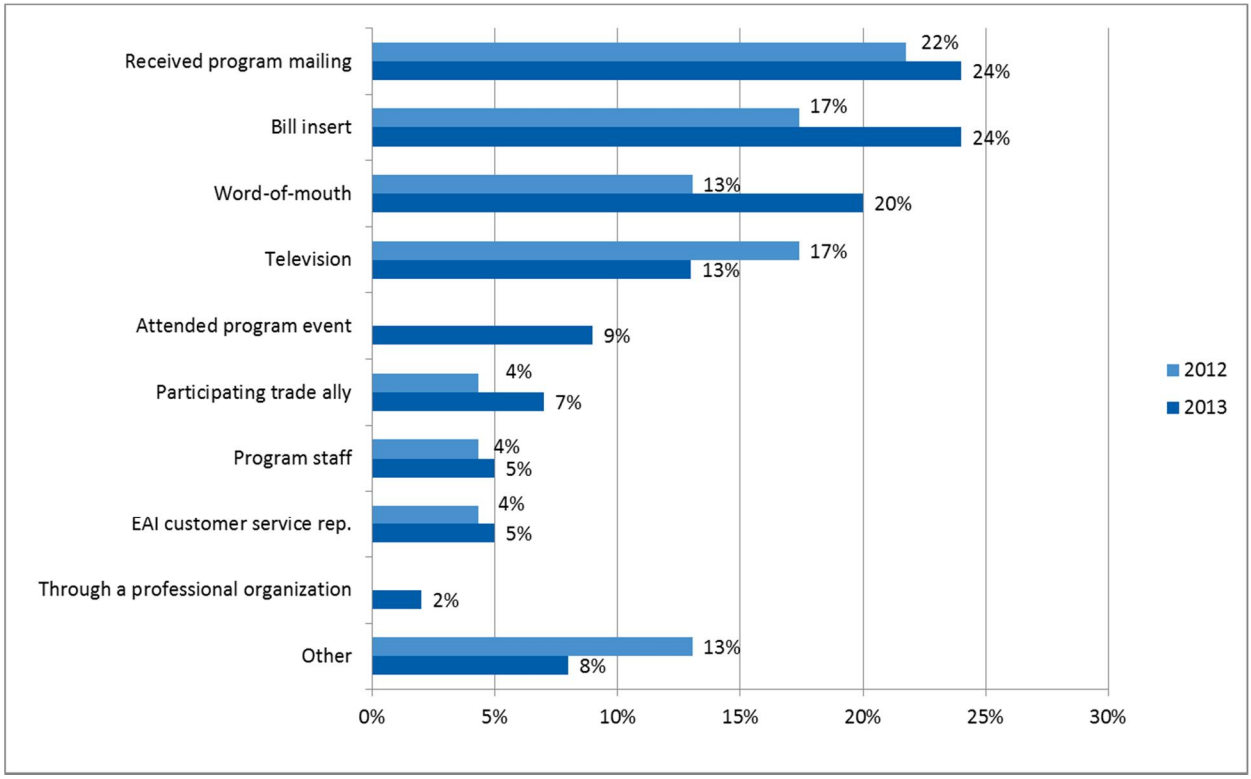
Figure 77. Nonparticipant Sources of information, 2012-2013



Q9 (2013) and Q8 (2012). In what ways have you heard about Entergy energy-efficiency programs? [Multiple responses allowed] (n=100, 2013; n=23, 2012)

Administrative Processes

Bi-weekly meetings enabled program staff to track project progress and effectively manage the pipeline.

As recommended in the 2012 evaluation, program staff consulted with each other and with the Evaluation Team on a bi-weekly basis to monitor projects' status and to discuss M&V plans. Program staff reported that this coordination enabled them to more effectively track project status and proactively work with customers to meet project milestones. This process also minimized M&V uncertainty because staff were able to confer with the Evaluation Team about savings projections; as a result, program staff said they completed and paid incentives for more projects earlier in 2013 than they had in 2012.

Trade Ally Response

Trade allies were satisfied with the training CLEAResult provided.

Trade allies who attended trainings via webinar or in-person expressed satisfaction with the training. All 15 trade allies said the training they attended prepared them to understand program steps and requirements, and to answer customer questions. In addition, two trade allies called attention to the fact that CLEAResult staff were accessible and responsive when they had questions.

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Consistent with their high satisfaction levels, most trade allies did not identify potential training improvements. However, one trade ally suggested further training to facilitate networking opportunities across sectors, such as to help lighting vendors and HVAC contractors work together to sell comprehensive projects. This type of suggestion common in commercial program evaluations, and many utilities are making an effort to put such training in place.

Trade ally program participation created both higher sales and satisfied customers.

Trade allies expected and said program participation provided them with a variety of benefits, for example:

- Build relationships with customers because the program allows them to "bring something more."
- "Open doors with customers and provide an added value."
- Generate leads on projects.
- Shorten the payback and increase the ROI on lighting projects.
- "Expand our market in Arkansas."
- "Provide a more cost-effective way for customers to participate and save energy."

Trade allies reported realizing the expected benefits of increased sales and satisfied customers. Two of those interviewed noted that they had not received the leads they expected from the program, and that the price competition between network trade allies was fierce.

Despite the program's efficient administrative processes and incentive levels, trade allies experienced various challenges.

Trade allies noted that the program paperwork, incentive processing, and incentive levels enabled them to move forward quickly once customers expressed interest in pursuing a project. The following trade ally verbatim responses indicate aspects of the program that work well for them:

- "The training was great."
- "The system in place is a good one."
- "CLEAResult processes data in a timely manner so that the customer sees the incentive estimate. It helps them move forward quickly."
- "Paperwork process is simple."
- "It gives us an opportunity to have a warm introduction to customers" [because customers are more receptive to the program offer than to a cold call].
- "The amount of rebates are very good."

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However, while trade allies commended program efficiencies, they also identified some areas in which the program presented sales challenges. For example:

- "It's harder to give away free money…people think there is a catch."
- "The hardest part is actually getting ahold of the right person at Entergy…that probably took six to eight different phone calls."
- "The only challenge is the products we're allowed to offer. Sometimes our products aren't always available from our suppliers."
- "The challenge for us is having the ability to identify which end user has opted out of the program."

Customer Satisfaction

Participants were satisfied both with the program and with EAI as an electric service provider.

All 11 respondents said they were very satisfied with their program experience, with the incentive amount provided, and with EAI as an electric service provider. The same group also said they were either very satisfied or somewhat satisfied with the application process, the selection of eligible equipment, and how quickly they received the incentive payment. Both respondents who participated in Energy Master Planning and Energy Performance Benchmarking were very satisfied with their experience with those components of the program. These results are consistent with 2012 evaluation findings.

Measurement and Verification

M&V was not sufficient to evaluate some projects with a high level of certainty.

The implementer developed most M&V plans to conduct two weeks of pre- and post-retrofit metering. On some sampled projects, the Evaluation Team found the implementer conducted only a few days of pre or post metering. It is difficult to reliably characterize a system's operating performance with less than two weeks of measurement. This was particularly problematic on EAC1325, the largest project in the program population, in which the implementer only conducted six full days of post-installation metering for a new construction compressed air system. On that project, the post-installation data represented the only actual data available to calculate savings, and the quantity of data was insufficient to evaluate savings with any certainty.

The implementer also provided incentives for at least two energy efficiency measures (a compressed air leak repair and air dryer replacement) without any post-installation metering. During the program year, the Evaluation Team expressed concerns with the implementer's proposed leak repair savings estimation methodology and requested post-repair metering to confirm the savings. The implementer did not conduct the post-repair metering on the project for which they applied the proposed methodology. We believe the results significantly overstated the potential savings from this measure and adjusted the savings accordingly.

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Savings Calculation

Measure life should be discounted for equipment maintenance and refurbishment projects.

The implementer may have overestimated the measure life for several operations and maintenance measures. For some compressed air leak repair projects, the implementer specified a measure life of 5 years. This is a reasonable value, although it may overstate the amount of time the compressed air system will operate without further leaks. On other projects, the implementer specified a measure life of 10 years for the leak repair measure. The implementer also listed a 20-year measure life for two measures that refurbished existing equipment. That measure life is appropriate for a new equipment installation but likely overestimates the effective useful life of existing equipment that has been repaired or repurposed.

The implementer's approach in some compressed air leak repair projects raised concerns around savings uncertainty.

The Evaluation Team identified a large number of concerns related to the implementer's approach to compressed air leak repair savings. On one project, the implementer provided incentives for undertaking leak repairs without additional system analysis. We have generally found that programs in most jurisdictions provide incentives for leak repairs in the context of a comprehensive compressed air system study. The leak repairs can allow participants to reduce the pressure in their system, adding even more energy savings.

The implementer's method to calculate compressed air flow is inefficient. In every case but one, the implementer estimated airflow was based on metered compressed air power and the corresponding manufacturer's specifications. As noted previously, project EAC1307 achieved 76% of its energy savings by simply turning off a large compressor that was not actually contributing to the facility's compressed air system. The contractor invoiced $52,500 (in addition to a $30,000 feasibility study co-funded by EAI) to achieve these savings. The project did not achieve the majority of its energy savings until the middle of the retrofit metering period when Compressor #4 was turned off. The Program could have achieved similar savings with reduced engineering costs and more accurate results by installing air flow meters to record actual CFM.

The implementer also allowed contractors to conduct multiple leak repair surveys at the same facility within the same program year and occasionally within a few months of each other. These surveys relied on ultrasonic meters to identify leaks and then orifice size and system pressure to estimate the amount of leakage. The resulting leakage estimates either indicated a lack of persistence from previous leak repairs and/or overestimation of leakage potential. In one case, the combined estimate of leakage from both leak repair surveys exceeded the average baseline airflow.

The implementer's methods of estimating energy savings could have been more rigorous.

The Evaluation Team found several instances in which the implementer calculated energy savings based on metering data without regard to other system impacts. The most frequent circumstance involved implementer calculations that claimed energy savings as the difference between pre and post metered consumption without considering lower production. The implementer often performed linear

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regressions to confirm the system did not have a statistically-significant correlation between production and electric demand. However, the Evaluation Team considers it reasonable to apply additional engineering calculations to benchmark energy savings using nameplate equipment data or secondary sources when large shifts in production render the M&V data as suspect.

In addition, the Evaluation Team found one instance in which the implementer had improperly excluded metered data for several injection molding lines that resulted in either a low baseline consumption or high retrofit consumption. We reviewed the data and determined the implementer's exclusions were inappropriate. We adjusted the energy savings to a more reasonable level using all available data.

Some compressed air systems operated less efficiently after the energy efficiency project.

The Evaluation Team identified at least three projects in which the compressed air system's specific power (in terms of airflow per unit of demand) declined from the baseline to the retrofit case. This means the system generated less airflow for the same amount of power after the energy efficiency project. The projects performed a number of energy efficiency improvements that substantially reduced energy consumption, but may not have been commissioned correctly. It is likely the projects would have resulted in even more savings if the systems had been commissioned appropriately.

Evaluation Recommendations

Recommendations for the C&I Custom Program include the following.

Adjust the qualifications for compressed air leak repairs.

The Evaluation Team found several issues around the Program's method of finding and repairing compressed air leak. We identified several methods to potentially improve Program performance and savings estimates.

Compressed air leak repairs are usually most effective in the context of a comprehensive compressed air study and retrofit project. We recommend that the Program not provide incentives for compressed air leak repairs on their own.

In this program, multiple leak surveys at the same facility within a short period of time resulted in excessive leak estimates, including one that estimated more leakage than the baseline air flow. Compressed air leak repairs also likely have low persistence due to the vibration from air compressors and impacts of air pressure. We recommend the implementer restrict each facility to only one round of leak surveys and repairs that can be completed in each program year.

Provide more QC to ensure effective commissioning and system operation.

The Evaluation Team identified several compressed air projects that performed less efficiently after the energy efficiency measures. This could be due to a number of issues, such as improper commissioning, poorly-specified equipment, or inaccurate compressed air flow estimates. We recommend the implementer review the pre and post-measure performance of the system to ensure efficient system operation.

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Conduct metering for two weeks.

The implementer stated in each project's M&V Plan, where metering was considered, that they would conduct two weeks of pre and/or post-installation metering. This level of M&V is reasonably appropriate to extrapolate equipment performance to a full year. In several cases, the Evaluation Team found the implementer conducted only a few days to one week of metering. We recommend the implementer always conduct, at a minimum, two weeks of metering where required.

Use M&V data appropriately.

In some cases, the Evaluation Team found that the implementer calculated savings as the difference between pre and post-installation consumption without regard for production variations or other operating details that affected energy use. In another case, the implementer excluded appropriate metering data that would have reduced energy savings estimates. We recommend the implementer consider benchmarking savings estimates against results from reasonable secondary sources. We also recommend the implementer not exclude M&V data that lowers energy savings estimates without a solid rationale.

Suggestions for Improvement

In addition to the recommendations above, the Evaluation Team identified the following tactical suggestions for the C&I Custom program.

Develop ways to enhance and reward trade ally marketing efforts.

With the elimination of EAI customer service representatives, trade allies will play an increasingly important role in generating program leads. EAI's 2013 efforts to lay a foundation for trade ally skill development and sales training should facilitate the transition, but EAI and CLEAResult will need to pay constant attention to the trade ally population if they are to conduct primary program outreach and maintain program success.

Set appropriate measure lives.

The Evaluation Team recommends the Program adopt a measure life of five years for compressed air leak repairs. Several leak repair projects already assume this value, but it should be made consistent across all leak repair projects. We also recommend that the Program adopt a measure life of eight to 10 years for operations and maintenance projects that only repair or refurbish existing equipment.

Conduct a persistence study on industrial operation and maintenance measures.

Operations and maintenance (O&M) measures, such as compressed air leak repairs, may have much shorter effective useful lives than new equipment installations. Previous program years had few of these measures and focused more on new equipment installations. We recommend that EAI consider funding a study on O&M measure persistence at regular intervals as part of the evaluation cycle. We recommend the first studies occur in 2016 and 2018 to gauge the persistence of the 2013 O&M measures at three and five-year intervals.

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Investigate more effective air flow estimates.

A large portion of 2013 Program savings derived from compressed air measures. Program contractors spent a large amount of resources to investigate compressed air equipment and O&M measures. With one exception, the energy savings for these measures relied on estimated air flow from power metering in conjunction with manufacturer's compressor curves. The Evaluation Team recommends the implementer investigate more accurate methods to determine air flow, such as installing air flow meters in compressed air lines.

We acknowledge that this practice is more expensive and invasive than the implementer's current practice, but it should result in much less expensive measure investigation. In at least one case a contractor spent $82,500 to achieve savings from turning off an air compressor that was not contributing to air flow. That measure could have been quickly and cost-effectively identified through flow meters. It should also result in much more accurate energy-savings estimates. We note that other utility administrators, such as the Energy Trust of Oregon, employ this method successfully.

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CitySmart Program

Through the CitySmart Program, EAI offers energy-efficiency incentives, benchmarking, and technical assistance to institutional and public entities in its service territory, such as schools and universities. EAI helps facility supervisors understand the benefits of energy efficiency when planning and investing in new or existing public facilities. CitySmart Program participants may install custom or prescriptive measures, which encompass low-flow fixtures, energy-efficient lighting, high-efficiency heating and cooling equipment, electronic chillers, efficient motors, vending misers, personal computer (PC) power management, and more. EAI uses an incentive structure with tiered bonuses, similar to its C&I Custom Program, with incentives ranging from $0.10 to $0.14 per kWh saved. EAI also offers energy performance benchmarking and energy master planning as part of the program.

CLEAResult implements all phases of the CitySmart Program, from conducting trade ally outreach to processing incentive payments, and works closely with the EAI customer service managers to identify customers with potentially eligible energy-efficiency projects. EAI's customer service managers promote the program to cities, counties, school districts, and universities.

Program Status Overview

EAI exceeded its 2013 CitySmart Program goals of 10,352 MWh of energy savings and 1.4 MW of demand reductions by 67% and 27%, respectively. The program installed 717 projects at 316 unique addresses representing 101 customers. Table 167 provides an overview of these results.

Table 167. CitySmart Program 2013 Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	10,352	17,237	167%
Demand Savings (MW)*	1.4	1.7	127%
Participation (customers)	159	101	64%
Budget	$2,901,764	$2,587,459	89%

* The evaluated net MWh and MW values include a line loss adjustment factor of 1.0849 and a NTG ratio of 0.95.

The program achieved these goals earlier in the year than anticipated. Program and implementation staff attributed this success to increased direct installation efforts, repeat customers, and significant customer interest in PC power management.

In 2012, EAI updated the CitySmart Program incentives to a tiered structure that offers a greater incentive per kWh when the participant installs more measures. EAI enables customers that participated in CitySmart as far back as 2010 to qualify for the tiered incentives when they install additional measures; this encourages past participants to perform deeper retrofits. Additionally, in response to customer requests for higher incentives, EAI added free direct install measures to the program.

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In 2013, the implementation team also added a second analyst engineer and a part-time administrative assistant to support the CitySmart Program. Now, each engineer manages site visits and direct installations in one half of EAI's service territory and the administrative assistant manages paperwork to support the site visits.

Status of 2012 Evaluation Recommendations

Table 168 lists the status of each CitySmart Program recommendation reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed nearly all of the 2012 recommendations during the 2013 program year.

Table 168. 2013 Status of 2012 CitySmart Program Recommendations

2012 Recommendation	2013 Status
Consider offering higher incentives for a limited time for projects that are completed earlier in a calendar year. This could encourage timely project processes.	*Completed.* Program staff discussed possible changes to align the incentive structure with those in the Small Business or C&I Custom programs, but determined that investing in feasibility and energy master planning studies was a better use of program funds. Staff will consider incentive level changes in subsequent program years.
Consider increasing incentives for CitySmart customers.	
Work closely with customers to plan ahead in scheduling project milestones.	*Completed.* CLEAResult hired additional staff to conduct customer follow-up.
Strengthen engagement opportunities with performance contractors by working with the Arkansas State Energy Office and the National Association of Energy Service Companies.	*In Progress/Partial.* Program staff recruited one contractor in 2013 that offers lease financing options for public sector customers and municipal tax exempt projects. Staff remain interested in exploring other options, as many municipalities or schools are not permitted to take on financing.
Evaluate opportunities for offering performance contracting, either as a program component, as a standalone program, or by engaging the Arkansas State Energy Office's efforts to develop a statewide program.	
Encourage customers to install comprehensive projects that include measures other than lighting upgrades. Present larger custom projects as part of a phased plan that includes ROI analysis so facility managers can consider the long-term possibilities for their facilities and present this information to additional decision makers.	*Completed.* Program staff used opportunity assessment reports to encourage customers to implement projects in a phased approach. Several customers used such an approach in 2013.
Stress project financial benefits in program marketing. For example, develop marketing materials targeted to schools that highlighting how investments in energy-efficient upgrades can, in the long-term, allow schools to redirect energy budgets toward educational needs.	*Completed.* The staff describe program financial benefits in opportunity assessment reports, case studies, benchmarking, and energy master planning sessions.
Evaluate opportunities to work with customers to develop creative financing mechanisms as a way for	*In Progress/Partial.* Staff are developing a financially-oriented fact sheet that explains financial options and

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2012 Recommendation	2013 Status
public sector customers to fund energy-efficiency improvements outside their operating budgets.	solutions for customers. The trade ally that offers lease financing to commercial and public sector customers uses a descriptive fact sheet.
Reduce the number of CitySmart incentives for technical assistance, and use that budget to increase equipment incentives.	*Completed.* Staff considered adjusting technical assistance funding, but many more customers used the service in 2013. Rather than shifting money to equipment incentives, staff determined that continuing to offer technical assistance, particularly to returning participants who want to complete more comprehensive projects, was a more productive use of those program funds.
Develop marketing materials, such as a separate fact sheet focused on the program's technical assistance benefits. Currently, these program components are given only brief attention at the back of the program manual.	*In Progress/Partial.* Implementation staff are currently developing individual measure fact sheets as well as sector-specific fact sheets. Staff did not develop materials related to any technical assistance components.
Train trade allies on the benefits and requirements associated with technical assistance, so they can be more effective program advocates.	*Completed.* The full-time trade ally coordinator conducted regular training sessions and developed a newsletter that provides technical tips and program information.
Continue to focus on a word-of-mouth, personal outreach approach.	*Completed.* Program staff continued to focus on word-of-mouth and personal outreach in 2013.
Increase coordination with trade allies to capitalize on their exposure to potential participants. Offer training and networking events to educate trade allies about the program and its unique components, such as energy master planning and energy benchmarking.	*In Progress/Partial.* The trade ally coordinator conducted frequent trade ally training sessions. Staff are also developing new collateral in response to contractor requests.
Because CitySmart projects often entail coordination with multiple decision makers, conduct multilevel outreach along the decision chain by meeting with members of the Arkansas School Board or presenting at school district functions, facility manager events, Arkansas School Board Association meetings, or State Department of Education events.	*Completed.* Staff conducted outreach efforts to the Arkansas School Board Association, local school districts, and facility manager meetings. These events will continue in 2014.
Program and implementation staff should coordinate closely to have account service representatives follow up with potential program participants by phone and email. Establish roles and responsibilities specifically around customer follow up and outreach tasks to ensure that customers are not contacted repeatedly by different staff, or contacted after they declined participation.	*In Progress/Partial.* Program staff coordinates with EAI account service managers to establish a primary point of contact. Staff also plans to revise the program manual in 2014 to clarify staff roles and responsibilities associated with communications and customer follow up.
Ensure that customer-facing materials clearly explain	*Completed.* The current marketing materials emphasize

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2012 Recommendation	2013 Status
the program requirements and project installation options so that customers understand they are not required to implement every recommendation to receive an incentive.	that the program helps customers identify energy savings specific to their building or facility. Program staff also communicated to customers and trade allies that not all recommendations must be implemented before the customer can receive an incentive.
Leverage high participant satisfaction by developing case studies to illustrate the program benefits and possibilities for financial return	*Completed.* Staff developed case studies and sector-specific fact sheets.
Include guidelines in the program manual and process flow chart to identify customer contact points and responsibilities concerning customer communications.	*In Progress/Partial.* Staff plans to update the program manual in 2014 to incorporate 2012 recommendations.
The implementer should document the assumptions associated with the RTF monitor run-time estimate and ensure they are reasonable for a school setting.	*N/A.* PC power management is now in TRM 3.0
If the implementer develops a deemed savings number for PC power management, they should use the following data: • Information on the power use of desktops, which is gathered at the site. • Examination of deemed savings values from other utility programs. • Data from a few other sites using PC power management software that provides site-specific estimates of savings and the number of computers already set to be power managed. • Results from conducting a similar study at a different commercial site over a longer time period, and using meters that provide time series wattage data.	*N/A.* PC power management is now in TRM 3.0

Analysis Methodology

For the CitySmart Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[115]

- Year End Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)

[115] The Evaluation Team conducted a condensed process evaluation of the CitySmart Program.

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- Participant Surveys (n=29; part of EAI combined participant surveys)[116]
- Nonparticipant Surveys (n=281 for EAI commercial nonparticipant surveys)[117]
- Trade Ally Interviews (n=20 EAI commercial trade allies)[118]
- Desk Reviews (n=4)
- Database Review (census)
- Site Visit (n=1)
- Calculation of TRM-Based Savings
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the CitySmart Program, which consisted of a gross savings evaluation, TRM savings review, on-site measure verification, and NTG analysis.

The CitySmart Program surpassed its energy-savings goal of 10,352 MWh by 67%, based on evaluated net energy savings. Table 169 presents these findings. The program also exceeded its peak coincident demand reduction goal of 1.4 MW (Table 170). These numbers include an 8.49% savings adjustment from the point of savings to account for line losses and a NTG ratio of 0.95.

Table 169. CitySmart Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)	Percent of Energy Goal Achieved
10,352	17,237	167%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor and a NTG ratio of 0.95.

[116] The Evaluation Team developed a combined commercial participant survey with core survey questions and program-specific questions for C&I Prescriptive, C&I Custom, CitySmart, and AES. Results are reported by program.

[117] The Evaluation Team developed a combined commercial nonparticipant survey, administered to 281 EAI customers. Results are reported in aggregate.

[118] Because EAI qualifies trade allies to work across all commercial programs, the Evaluation Team developed and administered a combined commercial trade ally interview guide for the C&I Prescriptive, C&I Custom, CitySmart, and Small Business programs. Results are reported in aggregate.

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Table 170. CitySmart Net Demand Reduction Goal and Evaluated Net Demand Reduction

Demand Reduction Goal (kW)	Net Evaluated Demand Reduction* (kW)	Percent of Demand Goal Achieved
1,380	1,747	127%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor and a NTG ratio of 0.95.

Site Visits

The Evaluation Team conducted site visits for lighting projects drawn from across multiple programs. We focused on the building type designations: office, manufacturing, and multiple categories of retail. Table 171 lists the office building types by the amount of CitySmart savings.

Table 171. CitySmart *Ex Ante* Savings for Lighting Measures by Building Type*

Building Type	*Ex Ante* Energy Savings (MWh)	*Ex Ante* Demand Reduction (kW)
Office	854	194
Education: College, University, Vocational, Day Care, and K-12 w/ Summer Session	763	162
Outdoor	223	0
Education: k-12, w/o Summer Session	167	31
Public Order and Safety	147	35
Lodging (Hotel/Motel/Dorm): Rooms	52	5
Lodging (Hotel/Motel/Dorm): Common Areas	43	6
Service (Excluding Food)	42	12
Public Assembly	5	1
Religious	1	0
Total	2,296	446

* The individual gross MWh and kW savings are presented excluding line losses.
Totals may not sum precisely due to rounding.

The Evaluation Team conducted a site visit at one CitySmart office project to verify that the reported equipment was installed and operating correctly, and to install light loggers on a sample of lighting fixtures at the facility. We supplemented our findings with data from 14 other site visits we conducted at office building types for 2013 C&I Prescriptive and Small Business programs' projects. We collected data on light operating hours for at least seven weeks to estimate the realization rates for energy savings and demand reduction.

One of the Team's goals with C&I light logging was to gather primary data on local conditions in Arkansas that may inform more precise parameter values for the TRM. After conducting two years of light logging research, the Team determined an average AOH of 3,227 for office building types, with a CF of 0.50 for local conditions in Arkansas, while the TRM 3.0 specifies values of 3,737 AOH and 0.77 CF (Table 172). The 95% (two-tail) upper confidence limits of the estimated means were 3,727 AOH and

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0.50 CF, which are both below the TRM 3.0 values.[119] We applied these primary data to office lighting savings for 2013.

Table 172. Office Building Type Annual Operating Hours from 2012 and 2013 Meters

Parameter	Sites	Fixtures	Mean	Standard Error	TRM V 3.0	Evaluated
AOH	18	139	3,227	237	3,737	3,227
CF	18	139	0.50	0.03	0.77	0.50

Desk Review of Lighting and Non-Lighting Measures

The Evaluation Team reviewed the TRM 3.0 formulas and inputs for each of the measures implemented in the CitySmart Program to verify they were reasonable. We used raw measure data from the EAI ArchEE database to recalculate savings for the census of measures and to verify that the implementer applied the TRM algorithms correctly.

For this task, we used the EAI ArchEE database for prescriptive projects, which included location, building type, and space type. We used equipment type, quantity, size and efficiency as listed on the nameplate, and hours of operation for both pre- and post-installation conditions.

For PC power management measures, we were initially unable to replicate *ex ante* savings calculations based on the database fields. We obtained project files from four projects to review how quantities, equipment types, and reported savings had been captured in the EAI ArchEE database. Based on these desk reviews, we replicated savings calculations and determined a realization rate of 100% for energy savings. We uncovered database data entry errors at two participant sites, however, which resulted in a 79% demand reduction realization rate for this measure.[120]

For one custom HVAC controls project, we inspected the eQuest building model and report and found that the model was closely calibrated with the metered data.

Evaluated Gross Savings Analysis and TRM Review

The Evaluation Team verified that TRM 3.0 formulas and inputs were reasonable for all program measures implemented through the CitySmart Program, including prescriptive lighting, lighting controls, vending misers, PC power management, pre-rinse spray valves, and faucet aerators. We found no significant issues with the TRM 3.0 values, with the exception that our metered AOH and CF at office

[119] To estimate average AOH and CF, we weighted logger data for each project by the percent of savings represented by each logger. Then, we weighted across projects to represent the relative contribution of each to total savings. In estimating uncertainty, we clustered error at the project level to account for variance across loggers, as well as for variance across projects.

[120] Cadmus worked with the program implementer to resolve these data entry issues; however the adjustments were not completed in time to incorporate into the 2013 evaluation.

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building type lighting projects was lower than the deemed AOH and CF found in the TRM 3.0 (Vol. 2, Sec. 3.6.3).

PC Power Management is a new deemed measure specified in TRM 3.0 (Vol. 2, Sec. 3.7.3) based on the ENERGY STAR Low Carbon IT Savings calculator.[121] To calculate savings, we input wattages from the TRM into the ENERGY STAR calculator, and assumed that computers were used for 8 hours per day, 5 days per week, with 22 days off per year and that 36% of the computers would be turned off manually each evening by users. By replicating savings by equipment type in the TRM, we determined that the savings for this measure was reasonable.

Measure-Specific Ex Post Electricity Savings

The Evaluation Team calculated the *ex post* savings for each measure by applying TRM 3.0 formulas to the input values in the ArchEE database census of projects. For lighting and lighting controls measures, we applied the realization rates derived from site visit data to the AOH and CF for the office building type, and then applied the adjusted AOH and CF to all lighting projects in office buildings.

Table 173 and
Table 174 show the calculated total *ex post* savings and realization rate for each measure and for the total program. These savings are estimated at the point-of-use and thus do not include line losses.

Table 173. CitySmart *Ex Ante* and *Ex Post* Gross Energy Savings*

Measure Category	Description	*Ex Ante* Energy Savings (MWh)	*Ex Post* Energy Savings (MWh)	Realization Rate
Appliances	Vending Miser	430	430	100%
Domestic Hot Water	Faucet Aerator	3,069	3,069	100%
	Pre-Rinse Spray Valves	13	13	100%
HVAC	Custom Control	1,505	1,505	100%
	Water Chilling Equipment	43	43	100%
Lighting	CFL	120	112	94%
	HID	32	32	100%
	LED	313	297	95%
	Lighting Control	16	16	100%
	Linear Fluorescent	1,763	1,675	95%
	Modular CFL and CCFL	53	53	100%
Plug Load	PC Power Management	9,478	9,478	100%
Total		16,835	16,724	99%

* The individual gross MWh savings are presented excluding line losses.

[121] http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_mgt_low_carbon

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Totals may not sum precisely due to rounding.

Table 174. CitySmart *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction*

Measure Category	Description	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
Appliances	Vending Miser	0	8	0%
Domestic Hot Water	Faucet Aerator	746	746	100%
	Pre-Rinse Spray Valves	3	3	100%
HVAC	Custom Control	57	57	100%
	Water Chilling Equipment	29	29	100%
Lighting	CFL	23	19	82%
	HID	0	0	0%
	LED	51	42	82%
	Lighting Control	4	4	99%
	Linear Fluorescent	368	312	85%
	Modular CFL and CCFL	0	0	0%
Plug Load	PC Power Management	602	475	79%
Total		1,882	1,695	90%

*Gross demand reduction is presented excluding line losses.
Totals may not sum precisely due to rounding.

Significant differences between *ex ante* and *ex post* savings are due to the following:

- For lighting and lighting controls, our two subsequent years of site visit metering across multiple programs revealed a lower AOH and CF for the office building types than the deemed values the implementer used based on the TRM 3.0 (Vol. 2, Sec. 3.6.3). We applied the metered AOH and CF to all projects with deemed hours for office building types. This led to lower kW and MWh savings.
- For PC power management, the TRM 3.0 (Vol. 2, Sec. 3.7.3) was inconsistently applied to kW savings. In two projects, an apparent database entry error resulted in *ex ante* savings that did not flow properly from the other inputs in the database. The savings for these projects also did not match the savings in their respective project files. Using the TRM 3.0 formulas and the verified inputs led to lower kW savings..
- For vending misers, the TRM 3.0 (Vol. 2, Sec. 3.7.4) assigns a per-unit benefit to energy as well as to peak demand savings. Although EAI did not claim kW savings, the Team assigned demand savings per the TRM.

Net-to-Gross Analysis

The Evaluation Team calculated two distinct freeridership rates for CitySmart Program participants and contractors, following the analysis approach outlined in the Evaluation Methodology section of this report. Details specific to the CitySmart Program are outlined below.

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Freeridership

As some customers installed more than one program measure, the Team assessed participant freeridership at the measure level rather than at the participant level. We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had plans to purchase or install the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without the program they would have installed a program-eligible measure of the same (or higher) efficiency within a year.

Table 175 shows the survey questions we used to assess freeridership for each criterion. We then used the three freeridership criteria scores to determine overall program freeridership.

Table 175. CitySmart Program Participant Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans for Measure Installation	Before learning about the EAI CitySmart Program, was your organization already planning to purchase and install the measure in 2013?*
Available Budget	If the program incentive had not been available, how likely is it that your 2013 budget would have included the full cost of the measure?*
Stated Intent	Without the incentive, would you have purchased a measure that had the same level of efficiency, higher efficiency, or lower efficiency?
	Without the incentive, would you have purchased the measure....(sooner, at the same time, later in the same year, in one or two years, etc.)?

* The Team varied this question wording slightly depending on the number of measures the contractor installed.

The Evaluation Team asked 26 participants about 34 measures they installed through the program.[122] We identified measures as freerider measures if they simultaneously met all three criteria. Responses indicated that there were no freerider measures. Accordingly, the *unweighted unadjusted* participant freeridership rate is estimated to be 0%, as shown in Table 176.

[122] The Team asked three additional respondents and about 38 additional measures, but the measures they reported were either not covered by the program or were not listed in the program tracking database as having been installed.

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Table 176. CitySmart Program Unweighted Unadjusted Participant Freeridership Rate

Freeridership Criteria	Unweighted Percent of Measures that Met Criteria (n=34)*
Prior Plans for Measure Installation	6%
Available Budget	21%
Stated Intent	9%
Unadjusted, Unweighted Freeridership Rate	0%

* Twenty-six participants answered freeridership questions about 34 CitySmart Program-incented measures.

Contractor Freeridership

The Evaluation Team interviewed 20 trade allies to estimate the overall freeridership rate for EAI's Commercial Programs.[123] As these contractors had worked across multiple EAI programs, it was not possible to determine freeridership on a program level.

We determined the contractor freeridership rate by examining each contractor's responses to a question that measured the influence of the program on their installation of high-efficiency equipment and services. We asked respondents who indicated that their sales of a particular program-supported measure would have been lower in absence of the program, "By what percentage do you estimate your number of jobs from the measure would be lower if the program had not been available?" We then calculated the number of freerider jobs for each contractor by subtracting the reported percentage from 100% and multiplying the resulting percentage by the total number of jobs that contractor performed through EAI's programs in the past year.

In total, the eight contractors reported installing or performing 163 program-supported projects, 22 of which were freerider jobs (those that would have happened in absence of the program). The resulting contractor freeridership rate, unweighted by the measure savings associated with the jobs, was 13%.

Adjusted Freeridership

The Evaluation Team applied the unweighted contractor freeridership rate to participants who reported that the contractor or equipment supplier was important in their decision to purchase and install program measures. We determined contractor importance using survey questions asking about the importance of: 1) advice from the equipment supplier or contractor, and 2) the energy assessment report (Table 177). If respondents indicated that both of these factors were very important in their installation decisions, we considered their contractors/equipment suppliers to be important in their decision to purchase and install program measures.

[123] The Team interviewed 20 EAI contractors, but only eight gave valid freeridership estimates.

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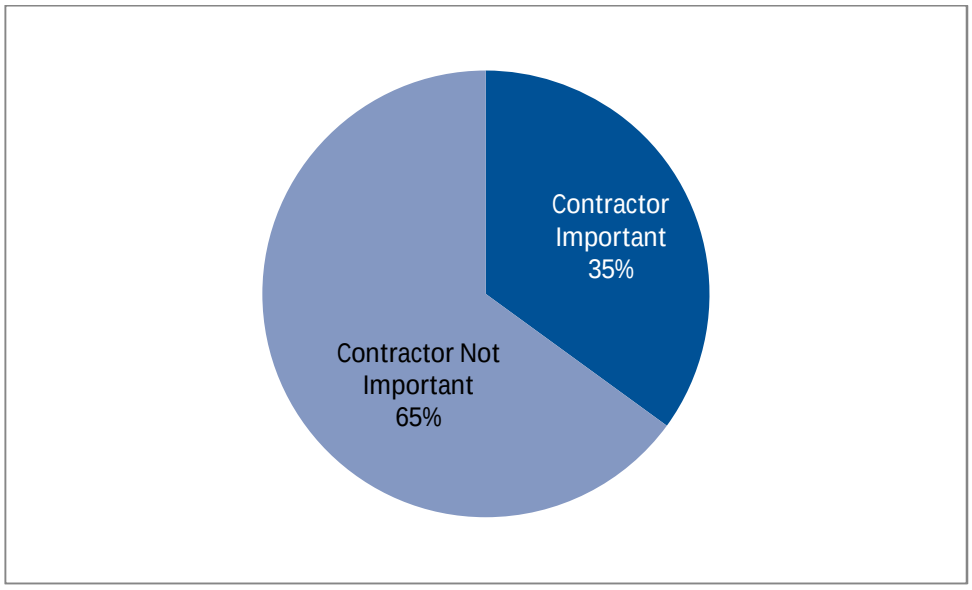
Table 177. CitySmart Program Participant Contractor Importance Questions

Survey Questions	Response Categories
In general, how important was advice from your equipment supplier or installation contractor in your decision to purchase the equipment that you installed through the program(s)?	Very Important Somewhat Important Not Very Important Not at All Important
In general, how important was the energy assessment done by your contractor or program staff in your decision to purchase the equipment you installed through the program(s)?	

Participants indicated that the contractor was important in their decisions to install 12 (35%) of the 34 measures that they were asked about (Figure 78). For these measures, we substituted the contractor freeridership estimate for the freeridership rate previously calculated according to the participants' responses to the freeridership questions.

Figure 78. CitySmart Program Contractor Importance



Multiple survey questions; Q39 and Q41, see Appendix A (n=34 measures; 26 respondents)

None of the measures for which participants deemed the contractor to be important were freerider measures according to the participants' own responses. As a result, while the overall unadjusted participant freeridership rate was 0%, after applying the unweighted contractor freeridership rate of 13% to the 12 measures for which the contractor was important, the *adjusted unweighted* participant freeridership rate was 5% (Table 178).

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Table 178. CitySmart Unweighted Adjusted Freeridership Rates by Contractor Importance

Contractor Importance	Number of Measures	Percent of Measures	Freeridership Rate Type	End-User Estimated, Unadjusted Freeridership Rate	Adjusted Freeridership Rate
Contractor was not important	22	65%	Unadjusted participant	0%	0%
Contractor was important	12	35%	Contractor	0%	13%
All	34	100%	Overall participant	0%	5%

Weighted Freeridership

To account for the different savings values associated with each of the installed measures and estimate the final freeridership rate, the Evaluation Team weighted the freeridership results by program savings for each measure.

When we weighted the results by the savings associated with the measures installed by the contractor's, the unweighted contractor freeridership rate of 13% increased to 17%. As the participants' *unadjusted, unweighted* freeridership rate was 0%, weighting by savings made no difference: the *unadjusted weighted* freeridership rate was therefore also 0%.

To estimate unadjusted weighted net savings, the Evaluation Team derived the NTG of 100% and applied it to the gross savings associated with the 34 measures installed by respondents. With an NTG of 100%, the unadjusted weighted net savings was equal to the gross savings (Table 179).

If we determined a contractor had been important to a participant's decision to install the specific measure, however, we applied the weighted contractor freeridership rate (17%) to that measure's savings. After applying the weighted contractor freeridership rate, the ratio of the sum of net savings to gross savings results in an *adjusted weighted* freeridership rate of 6%. Table 179 shows the gross and net savings corresponding with these adjusted freeridership ratings.

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Table 179. CitySmart Program Participant Weighted Unadjusted and Adjusted Freeridership Rate

Stratum	Total Measures	Gross Savings (kWh)	Unadjusted Net Savings		Adjusted Net Savings*	
			Percent Assigned	Net Savings (kWh)	Percent Assigned	Net Savings (kWh)
Contractor Important - Non Freerider	12	867,455	100%	867,455	83%	720,330
Contractor Unimportant - Non Freerider	22	1,441,263	100%	1,441,263	100%	1,441,263
Contractor Important - Freerider	0	0	0%	0	83%	0
Contractor Unimportant – Freerider	0	0	0%	0	0%	0
Total	34	2,308,717		2,308,717		2,161,593
Weighted Freeridership						94%

* We assigned a weighted contractor freeridership rate of 17% to measures for which the contractor was important.

Spillover

The Evaluation Team attempted to calculate spillover values for end-user participants and contractors. The Team quantified like-spillover, which is equipment installed outside of the program that is exactly the same type and efficiency as the equipment installed through EAI's programs, and where their experience with the program was important to their decision to implement the measure(s).

The following criteria were required for a measure to be considered as spillover:

- The service or measure was offered in the program portfolio,
- The customer did not receive a rebate or incentive for the measure, and
- The customer's or contractor's experience with the program was somewhat or very important in the decision to install the measure.[124]

One program participant reported installing program-eligible measures (exterior lighting) for which they did not receive a rebate, but the program was important in their decision. Based on program tracking data, the Evaluation Team estimated 18,562 kWh in energy savings for the one like-spillover measure. The resulting spillover rate estimate was 1% of gross savings (Table 180).

[124] The Evaluation Team asked respondents to identify the extent to which the program influenced their non-program sales (contractors) and non-program purchases (participants) using a scale of very important, somewhat important, not very important, or not at all important.

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Table 180. Participant Spillover Savings

Measures/Actions	Number of Measures	Savings per Measure (kWh)	Spillover Savings (kWh)
Exterior lighting	1	18,562	18,562
Total Spillover Savings	1		18,562
Total Gross Savings	2,308,717		
Spillover Rate	1%		

Based on participant survey results, there is no evidence of spillover among non-like program measures.

The Evaluation Team surveyed nonparticipants to determine if there was spillover among this group. The survey responses revealed no evidence of nonparticipant spillover.

Net-to-Gross

Table 181 presents the NTG ratio for CitySmart customers.

Table 181. Net-to-Gross Ratio

Parameter	Value
Weighted Freeridership Rate	0.06
Spillover	0.01
Net-to-Gross Ratio	0.95

Evaluated Net Savings

Table 182 shows the final evaluated net savings for the CitySmart Program. Applying the 0.95 NTG ratio to *ex post* gross savings results in *ex post* net energy savings of 15,888 MWh and coincident peak demand savings of 1,611 kW.

Table 182. Evaluated Net Savings

Savings	Evaluated Gross Savings	Net Savings	NTG Ratio
Coincident Peak Demand Savings (kW)	1,695	1,611	0.95
Annual Energy Savings (MWh)*	16,724	15,888	0.95

* kW and MWh savings are presented without line losses.

Evaluation Findings and Conclusions

The following section presents the evaluation finding. Each topic area heading includes a concluding statement, followed by findings that support the concluding statement.

Program Design

High initial cost and budget limitations continue to be the primary participation barriers.

Before making energy-saving improvements, 79% of survey respondents reported receiving a facility energy assessment. Of those, 39% installed all the recommended measures.

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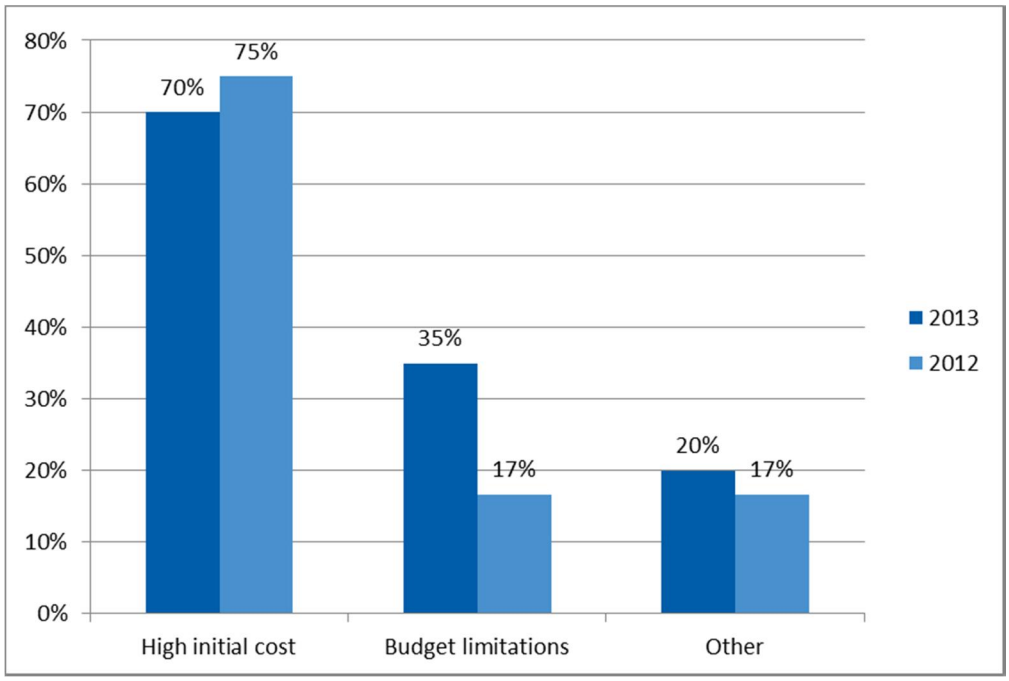
The majority of participants (69%) reported facing challenges that limited their ability to install all the measures recommended in the facility opportunity assessment. Of the 69% who reported facing challenges, 70% cited high initial cost and 35% cited budget limitations as their primary challenges.[125] For example, program staff reported that school districts tend to require a payback period of three years or less, and the many program measure incentives do not reduce the measure cost sufficiently to meet this payback criterion.

These findings are consistent with 2012 participant-reported barriers. In 2012, 80% of participants reported facing challenges to making energy-saving improvements at their facilities. Of those who faced challenges, 75% cited high initial cost and 17% cited budget limitations or competing investment needs as their primary challenges. The differences between 2012 and 2013 are presented in Figure 79.

Figure 79. Participant-Reported Barriers to CitySmart Program, 2012-2013



Q21 (2013) and Q20 (2012). What are the most significant of those challenges? [Multiple responses allowed] (n=20, 2013; n=12, 2012)

Projects represent a wider range of installed measures in 2013 compared to 2012.

In 2012, lighting represented approximately 66% of CitySmart Program savings, and one evaluation recommendation was that program and implementation staff diversify the program measure mix and encourage more comprehensive projects.

Program and implementation staff reported that customers expressed more interest in non-lighting measures in 2013 than they had in 2012. The staff attributes some of this increased interest to the

[125] Multiple responses were allowed.

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Arkansas TRM's addition of PC power management, which means the program staff can incent this tool. In 2013, EAI offered a generous incentive that allowed customers to install the measure with almost no capital outlay and, because many school and government buildings have a large number of computers at each facility, PC power management was the most installed measure in 2013.

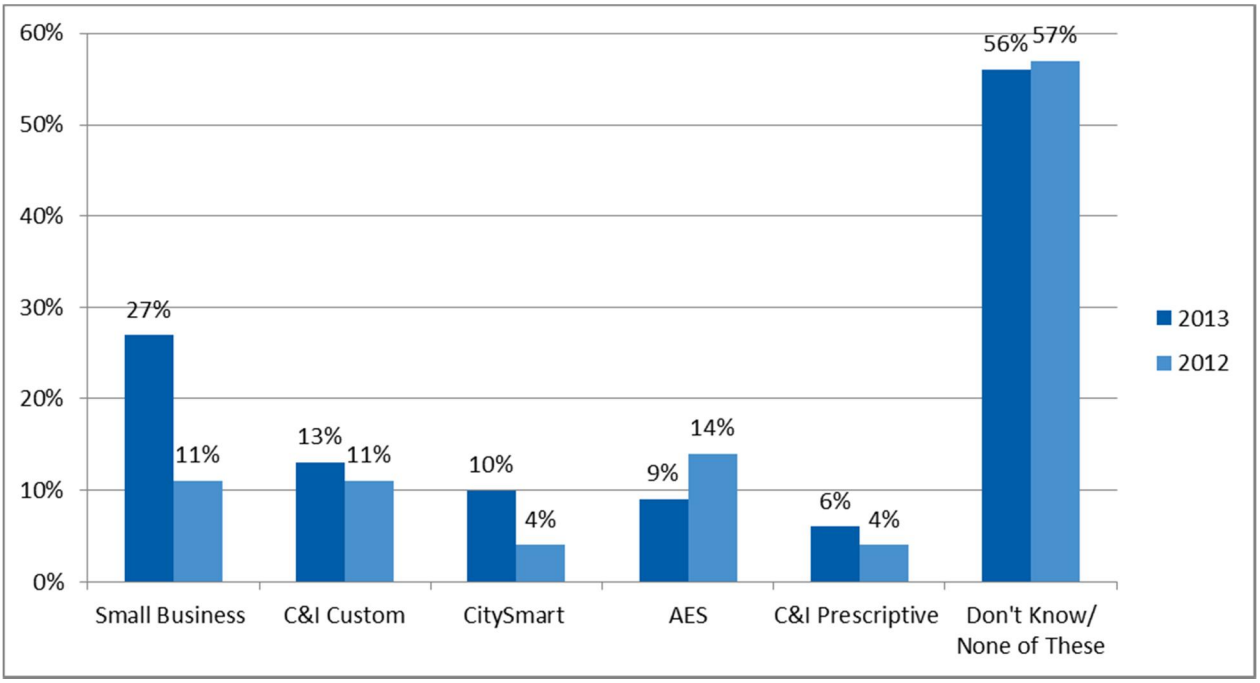
Program and implementation staff also reported reaching out to past participants to encourage them to pursue additional measures. Program staff stated: "If you've got a good customer there's always more that can be done." Staff encouraged past customers to consider an energy master planning session or to conduct benchmarking to identify additional energy-saving opportunities. As a result, many prior customers participated in the program again in 2013 to install measures other than lighting or direct install measures.

Marketing and Outreach

Awareness improved for all EAI commercial programs but remains low for CitySmart.

Forty percent of nonparticipants said they were aware that EAI offers programs to help C&I customers save energy and money. This figure reflects a small improvement over 2012, when 32% of nonparticipants (28 of 87) said they were aware of EAI's commercial programs. Among those customers who reported being aware of EAI's C&I programs in 2013, 10% had heard of CitySmart, which is quite modest, but more than double the awareness reported in 2012 (4%). Figure 80 shows nonparticipant awareness of EAI's commercial programs.

Figure 80. Nonparticipant Program Awareness, 2012-2013



Q6A (2013) and Q5A (2012). Which of the programs were you aware of? [Multiple responses allowed] (n=110, 2013; n=28, 2012)

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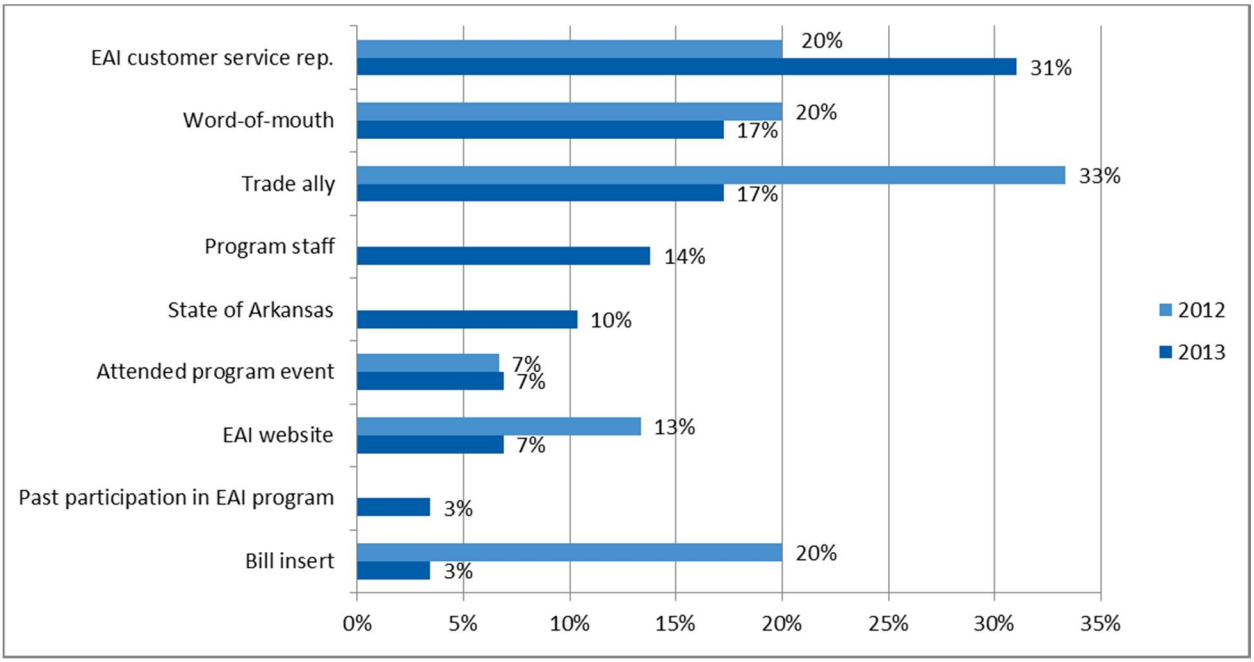
The most effective outreach tactics included word-of-mouth and direct contact by an EAI customer service representative, program staff, and trade allies.

EAI customer service representatives and program and implementation staff worked in concert to conduct direct outreach. They supplement hands-on outreach with direct mail and program fact sheets. As shown in Figure 81, participants learned about the program primarily from EAI staff, friends, family, business contacts, and trade allies.

Figure 81. Participant Source of Awareness of CitySmart



Q9 (2013) and Q7 (2012). In what ways have you heard about Entergy's CitySmart Program? [Multiple responses allowed] (n=29, 2013; n=15, 2012)

Nonparticipants learned about EAI programs in many of the same ways participants did, but cited program mailings and bill inserts with greater frequency. In addition, word-of-mouth also played a bigger role in 2013 than 2012 as how customers' heard about EAI's programs, with 20% of 2013 respondents saying they heard about the programs from someone else (Figure 81). Figure 82 illustrates the ways in which nonparticipants learned about EAI commercial energy-efficiency programs.

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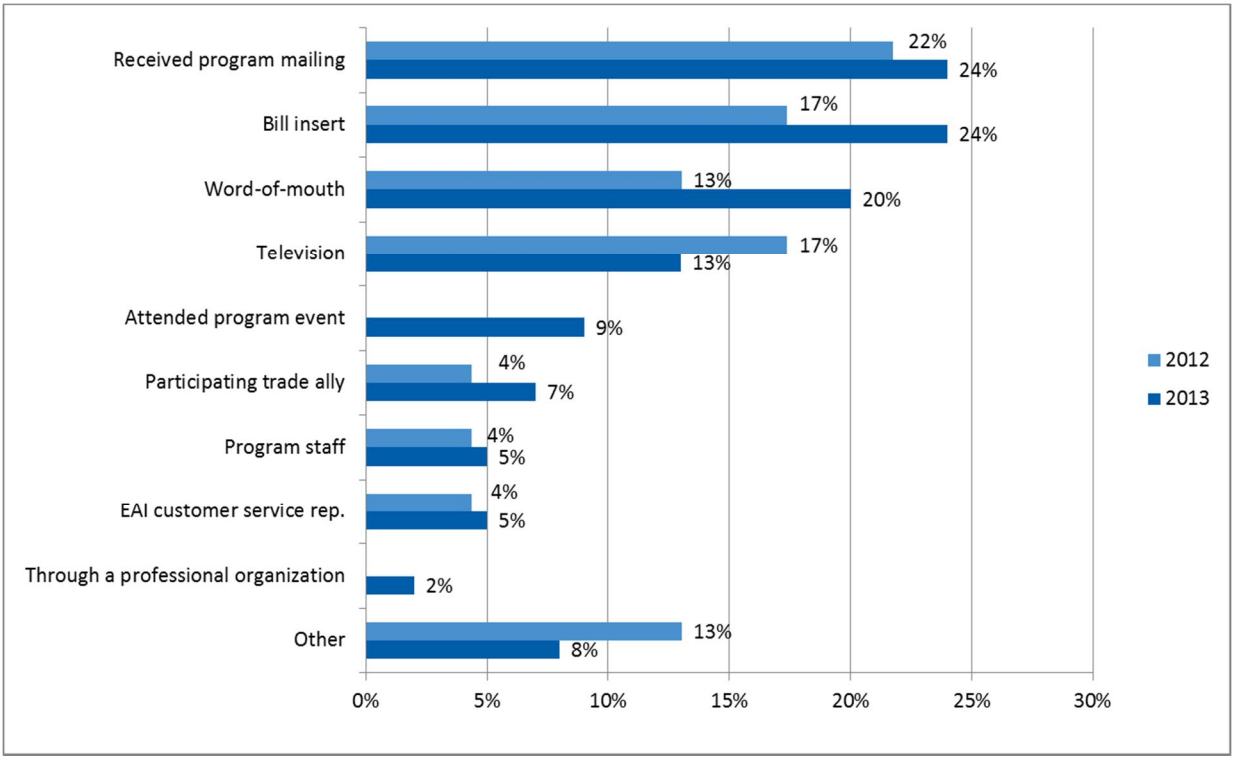
Figure 82. Nonparticipant Sources of Program Information, 2012-2013



Q9 (2013) and Q8 (2012). In what ways have you heard about Entergy's energy-efficiency programs? [Multiple responses allowed; question only asked if respondent was familiar with EAI programs] (n=100, 2013; n=23, 2012)

Adding resources allowed the program staff to reach more decision makers.

CLEAResult hired two additional staff members, which enabled the implementation program manager to focus more on key decision makers. While program and implementation staff presented to community groups in 2012, the implementation program manager enhanced efforts in 2013 by discussing the CitySmart Program and its energy master planning and benchmarking services with individuals in influential positions at their organizations. For example, the program implementer facilitated energy master planning sessions with superintendents, principals, county judges, and mayors. CitySmart staff also targeted professional associations, such as Rotary Club chapters, school board associations, and city councils.

Marketing and Outreach

An emphasis on trade ally direct outreach was meant to drive project leads and buffer against the loss of customer service representatives in 2014, but public procurement policies deterred some trade allies from being as active in the CitySmart Program.

Program and implementation staff reported that trade ally partnerships constituted an important customer outreach method in 2013. Although municipalities and schools tend to have in-house facility management teams, they typically use trade allies to install energy-efficiency measures. However, because public procurement policies often require a bidding process, the trade ally who initiates the

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customer contact may not necessarily install the project. As a result, program staff noted that some EAI commercial trade allies were less active in developing CitySmart projects than other C&I projects. Trade allies also commented that price competition between trade allies made participation a challenge.

EAI customer service representatives served an important outreach function for the program; they worked with program and implementation staff to identify eligible customers and introduce the program to customers who have an existing relationship with a representative. EAI plans to eliminate the customer service representative position for commercial accounts in 2014. The loss of this position spurred program and implementation staff to rely more on trade allies in 2013 to make connections with potential customers.

To prepare for the change, implementation staff focused trade ally outreach efforts on training existing trade allies more than on recruiting new ones, and on the implementation program manager increasing outreach to decision makers. Staff focused trade ally recruitment efforts on companies that have a wide service area and are able to serve many EAI customers. Implementation staff emphasized skill development through more trainings in-person and via a webinar to improve the trade allies' understanding of the EAI commercial programs, and they hired a new staff member as a trade ally coordinator across all EAI commercial programs.

The addition of a lease-financing contractor offers opportunities for public sector customers to address the cost barrier.

Participants and nonparticipants continue to identify cost and budget limitations as a barrier to participation. As recommended in the 2012 evaluation, EAI added one contractor to its commercial trade ally network that offers lease financing options for public sector customers in addition to C&I customers. Program staff continue to explore additional options that would make financing available to the municipalities and schools that are prohibited from taking on debt.

Administrative Processes

Bi-weekly meetings enabled program staff to track project progress and better manage the pipeline.

Program staff consulted with each other and with the Evaluation Team on a bi-weekly basis to monitor project status and discuss M&V plans. Program staff reported that this coordination enabled them to effectively track project status and proactively work with customers to meet project milestones. The tracking also minimized M&V process uncertainty and helped program staff close more projects earlier in the year.

Trade Ally Response

Trade allies were satisfied with the training CLEAResult provided.

Trade allies who attended one of CLEAResult's training sessions expressed satisfaction with the training they received. All 15 trade allies said the training prepared them to understand program steps and requirements, and to answer customer questions. In addition, two trade allies noted that CLEAResult staff was both accessible and responsive when they had questions.

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Most trade allies offered no suggestions for training improvements. One trade ally suggested additional training to help contractors network across sectors. Such training could facilitate coordination among trade allies, such as lighting vendors and HVAC contractors, by showing them how to work together to sell comprehensive projects.

Program participation helped trade allies increase sales and customer satisfaction.

All interviewed trade allies reported realizing two main benefits from their program participation: increased sales and satisfied customers. Several trade allies also noted additional benefits. For example, trade allies reported the program helped them:

- "Bring something more" to customers.
- "Open doors with customers and provide an added value."
- Generate leads on projects.
- Shorten the payback and increase the ROI on lighting projects.
- "Expand our market in Arkansas."
- "Provide a more cost-effective way for customers to participate and save energy."

Two trade allies noted that they had not received the leads they expected from the program. They indicated that being a part of a trade ally network made price competition fierce, because customers could select a qualified trade ally from EAI's approved contractors list and solicit multiple bids.

Despite the program staff's efficient administrative processes and generous program incentive levels, trade allies experienced various challenges.

Trade allies noted that the program paperwork, incentive processing, and incentive levels enabled them to progress quickly with a customer once they expressed interest or were awarded a bid. Trade allies mentioned the following aspects of the program that worked well:

- "The training was great."
- "The system in place [for the program application process] is a good one."
- "CLEAResult processes data in a timely manner so that the customer sees the incentive estimate. It helps them move forward quickly."
- "Paperwork process is simple."
- "It gives us an opportunity to have a warm introduction to customers" because customers are more receptive when contractors have something more to offer than a cold call.
- "The amount of rebates are very good."

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However, while trade allies commended the program's efficiency, they also identified a few areas in which they faced challenges selling energy-efficiency projects. For example:

- "It's harder to give away free money…people think there is a catch."
- "The only challenge is the products we're allowed to offer. Sometimes our products aren't always available from our suppliers."

Trade allies also commented that they appreciated the brief but frequent email communication from CLEAResult about program status. Two trade allies mentioned that they would like to be more informed about the program's future status because they have experienced sudden program closures in other states that hurt their business.

Customer Satisfaction

Participants were satisfied with the program and with EAI as an electric service provider.

Program and implementation staff reported high customer satisfaction with the program, which survey results confirmed. Program staff said that participants' told them they appreciated both the incentives and CLEAResult's professionalism. All 29 respondents said they were very or somewhat satisfied with EAI as an electric service provider, and with the following program features:

- Their overall experience with the program (29 of 29 respondents).
- The selection of eligible equipment (29 of 29 respondents).
- The information and technical assistance provided (28 of 28 respondents).
- The application process (28 of 28 respondents).
- The incentive amount provided (26 of 26 respondents).
- How quickly they received the incentive (25 of 25 respondents).

Three of 29 respondents participated in the program's energy performance benchmarking component; all three indicated being somewhat satisfied with their experience.

TRM

For lighting projects, the TRM 3.0 values for AOH and CF are not representative of conditions in Arkansas.

Based on our lighting metering at 18 office sites over two subsequent years, we determined HOU weighted by connected load. The TRM 3.0 (Vol. 2, Sec. 3.6.3) specifies 3,737 AOH and a 0.77 CF for office building types, while our analysis revealed 3,227 AOH and 0.50 CF.

Data Tracking and Reporting

The implementer provided database values that were incomplete or inconsistent with the final project scope.

The PC power management measure provided over 50% of the program savings, so it is important to ensure its representation in the database is consistent, accurate, and transparent. The Evaluation Team

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calculated savings based on a TRM 3.0 (Vol. 2, Sec. 3.7.3) lookup table that relies on deemed kW or kWh savings based on the equipment type being controlled (i.e., LCD monitor, computer, or laptop).

The database listed this equipment type in one of two fields, or not at all depending on the project. To confirm the inputs in the database, the Team requested the project files and made multiple local updates to the tracking system data to match the kWh savings to 100% of the *ex ante* savings. In some instances, no equipment type was listed in the database. In one such case, the Team found that the item under control was both a computer and an LCD monitor; in another instance we found the equipment type in subsequent line items where quantities of (100), (100), (40), and (40) were referring to computer, monitor, computer, monitor. For two projects, even after matching the kWh savings, the *ex ante* kW savings was larger than the Team could replicate. We determined that the implementer had not properly entered the savings calculated in the project files. We worked with the program implementer to resolve these issues going forward; however we were not able to incorporate the adjustments into our 2013 evaluation. These data entry errors led to a program kW savings realization rate for the PC power management measure of 79%.

Evaluation Recommendations

The Evaluation Team provided recommendations relevant to errors identified in the program tracking database and updates to the Arkansas TRM (as described above) under the Portfolio Conclusions and Recommendations section of this report.

Suggestions for Improvement

The Evaluation Team identified the following suggestion for improvement for the CitySmart Program.

Develop ways to enhance and reward trade ally marketing efforts in light of public procurement processes.

With the elimination of EAI customer service representatives, trade allies will play an increasingly important role in generating program leads. However, CitySmart trade allies must deal with the added challenge of public procurement processes. The foundation the implementer laid in 2013 to develop trade ally skills and support sales will help support the program during the transition, but the trade ally population will require constant attention if they are to become the primary program outreach vehicle; EAI may need to provide additional contractor incentives or rewards to encourage them to generate CitySmart project leads. Furthermore, the additional outreach to decision makers undertaken by the implementation manager and implementation field staff will continue to serve an important and complementary lead generation function.

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Agricultural Energy Solutions Program

Through the AES Program, EAI offers prescriptive and custom energy-efficiency options for agricultural customers. ICF implements the program with oversight from EAI program staff. EAI provides financial incentives and technical assistance through AES to help eligible agribusinesses replace aging, inefficient equipment and systems with new, energy-efficient technologies. EAI offers prescriptive incentives for a wide selection of energy-efficient lighting measures, including CFLs, high-performance linear fluorescent replacement lamps and fixtures, pulse-start metal halides, and lighting controls, including occupancy sensors. EAI also offers custom solutions for specific agricultural measures, including LED lamps for livestock houses; low energy livestock waterers; exhaust and circulation fans; high-volume, low-speed fans; milk pre-coolers; variable speed controllers for vacuum pumps; and variable frequency drives (VFDs) for irrigation pumps. ICF provides hands-on technical assistance and comprehensive education about available measures and typical payback periods.

Program Status Overview

In 2013, EAI exceeded the AES Program energy savings goal by 61%, but fell short of its participation goal and demand savings goal. This gap in participation underscores how hard it is for the utility to penetrate the agriculture sector. The AES Program underspent its allocated budget by 34%.Table 183 provides a summary of program performance against goals.

Table 183. AES Program 2013 Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	1,304	2,104	161%
Demand Savings (MW)*	0.391	0.291	74%
Participation (customers)	150	22	15%
Budget	$641,732	$442,272	69%

* MWh and kW actual represent evaluated net savings and reflect the application of a 1.0849 line loss factor.

While participation remained well under the program's goals, EAI more than doubled participation from 2012 to 2013, and achieved its energy-savings goal. Program staff and the Evaluation Team attributed the improved participation to these primary factors:

- Based on 2012 evaluation findings stating that direct communication and in-person outreach was essential in penetrating this market segment, implementation staff enhanced in-person outreach in 2013 by:
    - Adding a staff member with farming expertise to its program team and sponsoring events and meetings with farmers. In particular, staff said that having a person who "speaks the language" and knows the farmers made a tremendous difference in connecting with farmers and establishing trust in the community.

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  - Leveraging trade allies who are trusted by farmers as a reliable source of information about the program. The implementer's successful recruitment of many trade ally program ambassadors in 2013 contributed to the program meeting its targets.
- The program implementer developed a pipeline of projects due to referrals from participants and the program's strong financial case to farmers: a short payback period on lighting projects.
- Numerous customers implemented prescriptive CFL lighting and custom LED lighting for poultry houses, which produced the largest energy savings for the program in 2013. Both of these measures have lamp wattage savings in quantities that exceeded the demand reduction goal per participant. Because of the high annual operating hours in poultry houses, the custom LED lighting projects achieved significantly greater savings per participant than anticipated.

Status of 2012 Evaluation Recommendations

Table 184 lists the status of each AES Program recommendation reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* AES Program staff completed nearly all of the 2012 recommendations during the 2013 program year.

Table 184. 2013 Status of 2012 AES Program Recommendations

2012 Recommendation	2013 Status
Energy-efficiency programs have two primary levers to control participation: marketing and incentives. While the program suffered from extenuating circumstances in 2012, EAI should monitor these two factors as the program matures.	*In Progress/Partial.* Staff expanded the program's marketing approach by increasing efforts to develop relationships with farmers and agricultural service technicians.
Focus on increasing overall program participation through enhanced awareness and outreach efforts, then identify ways to increase participation in the custom track.	*Completed.* Staff devoted considerable time to increasing program awareness by attending events, working with trade allies, and capitalizing on participant experiences.
As more projects come to fruition, develop case studies to illustrate program benefits and possibilities for financial returns. Case studies should focus on both prescriptive and custom projects, and be published on the program website and in other materials to help interested farmers visualize projects.	*Completed.* Staff developed case studies in the fall of 2013 and plans to use them in 2014.
Consider offering tiered incentives for custom projects, such as those provided in CitySmart, to generate more interest in the custom track.	*Completed (Considered/Rejected).* Program staff noted that the kWh-based incentive negates the need for a tiered incentive, and left the incentives unchanged in 2013.
When recommending potential measures, present larger custom projects as part of a long-term, phased plan that includes an ROI analysis enabling farmers to consider the long-term possibilities for their facilities. This type of phased approach can make energy-	*Completed.* When recommending potential measures, ICF informs each participant of payback periods for each measure. Adding a farm-industry representative to the implementation team has enabled ICF to develop messages that resonate with farmers.

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2012 Recommendation	2013 Status
efficiency upgrades seem more manageable for small business operations.	
Continue to focus on a word-of-mouth, personal outreach approach. Engaging potential AES Program participants through in-person meetings can lead to more meaningful communication and can increase farmers' trust and understanding of the program benefits.	*Completed.* Program staff continue to prioritize engaging farmers through in-person meetings, phone calls, and events. Additionally, staff began developing relationships with distributors and service technicians who have long-standing relationships with farmers. Program staff educated these market actors to serve as program ambassadors.
Consider hosting an annual or semi-annual farming community breakfast to present the benefits of the program and highlight project successes. Invite past program participants to speak at the breakfast event, which will help other farmers visualize what is possible at their facilities and will build their trust in the program.	*Completed.* Program staff presented program information through breakfast and lunch events hosted by many different trade allies. In addition, staff hosted two coffee and donut events that garnered respectable attendance.
Introduce the program to farmers through direct mail during farmers' slow seasons, and then follow up with in-person or phone contact.	*Completed.* ICF developed and sent a letter to farmers during the slow season and followed up by phone to further engage these customers. They developed an irrigation direct mailer in late 2012 and sent it in early 2013, as well as a poultry mailer developed in the fall of 2013 that was sent in December 2013.
Supplement every outreach opportunity with literature that includes the EAI logo to add legitimacy to the program.	*Completed.* Program staff provided trade allies with EAI truck magnets and EAI-branded fact sheets. In addition, staff sent direct mail on EAI letterhead to potential customers. Starting in 2012, ICF provides literature for AES and other EAI programs at every outreach opportunity.
To reduce staff time spent on in-person outreach and to leverage the way in which farmers communicate, EAI should continue to develop partner resources, including Tyson, the USDA, Extension Services, equipment dealers, or organizations such as the Poultry Federation and other agriculture sector companies that understand farming cycles. Encourage these partners to highlight the program through grassroots communications and at events.	*Completed.* Program staff increased trade ally engagement and reached more farmers successfully through trade ally-based in-person outreach. As part of this effort, staff developed contacts with distributors and poultry service technicians at customer sites who have long-standing relationships with farmers. Additionally, program staff worked to establish relationships through the Rice Federation, Poultry Federation, Farm Bureau, USDA, Natural Resource Conservation Service, University of Arkansas Extension Service, Agricultural Council of Arkansas, and equipment dealers.
Maximize partnerships with farm equipment supply houses and with trade allies such as Tyson, the USDA, Extension Services, and contractors to minimize staff outreach time.	
Use a marketing calendar to properly time outreach to different farming segments.	*Completed.* Staff tracked marketing efforts more diligently and established a marketing calendar that

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2012 Recommendation	2013 Status
	described the timing of specific messages to target audiences. The marketing calendar is found in the *Program and Procedures Manual*.
Provide marketing and educational materials targeted to agricultural customer that address both the AES and AILC programs. Leverage existing AILC marketing channels to promote AES.	*Completed.* Since 2012, ICF has provided marketing materials to all trade allies and possible participants for both the AES and AILC programs, while also leveraging existing AILC marketing channels, such as the Farm Bureau, to promote AES.
Consider adding meeting times following the annual breakfast event for farmers to consult one-on-one with farm energy-efficiency experts and program staff to discuss project opportunities.	*Completed.* Staff engaged with trade allies following the coffee and donut events, as well as at trade ally functions.
Identify staff roles in the program manual, such as who performs QC reviews and who conducts participant communications, and provide contact information by name for each person involved in program implementation.	*Completed.* Implementation staff revised the program manual to define customer, trade ally, and program and implementation staff roles.
Identify the data that must be collected from participants, and outline how that data is submitted and tracked so that expectations are clear.	*Completed.* ICF updated the *Program and Procedures Manual* to describe data collection activities.
Monitor data collection and tracking to ensure it is sufficient to support program savings calculations and EM&V efforts.	*Completed.* Staff reported that ArchEE and Vision meet their needs, and that the Vision database can be designed to document QA/QC steps performed.

Analysis Methodology

For the AES Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities[126].

- Data Collection Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Managers (n=2)
- Year End Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Managers (n=2)
- Participant Surveys (n=6; part of the EAI combined participant surveys)[127]

[126] The Evaluation Team conducted a full process evaluation of the AES Program.

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- Nonparticipant Surveys (n=281 EAI combined commercial nonparticipant surveys; 10 results included in this report are from respondents who identified as farmers)[128]
- Desk Reviews (n=19)
- Calculation of TRM Based Savings
- Program Attribution Analysis (NTG)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the AES Program, which consisted of a gross savings evaluation, TRM savings review, desk review, and NTG analysis.

The AES Program achieved 161% of its energy-savings goal of 1,304 MWh, based on net evaluated energy savings. Table 185 presents these findings. The AES Program achieved 74% of its peak coincident demand-reduction goal of 391 kW (Table 186). These numbers reflect an 8.49% savings adjustment to account for line loss and a NTG ratio of 0.89 based on the Team's evaluation.

Table 185. AES Program Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
1,304	2,104	161%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 186. AES Program Demand Reduction Results

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction (MW) *	Percent of Demand Goal Achieved
0.391	0.291	74%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor

Review of Program Tracking Data

The Evaluation Team conducted a detailed review of the AES database to ensure that the tracking data were sufficient to calculate *ex ante* savings and did not contain missing or erroneous values. The Team

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127 The Evaluation Team developed a combined commercial participant survey with core survey questions and program-specific questions for C&I Prescriptive, C&I Custom, CitySmart, and AES. Results are reported by program.

128 The Evaluation Team developed a combined commercial nonparticipant survey, administered to 271 EAI customers, for C&I Prescriptive, C&I Custom, CitySmart, and AES. We separated results for agricultural nonparticipants from the overall survey results.

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also compared measure-specific inputs in the database to ensure they were consistent with inputs specified in the TRM 3.0.

Site Visits

The Evaluation Team did not conduct 2013 EM&V project site visits because none of the projects reported energy savings greater than 300 MWh, which is the threshold established for when to conduct on-site M&V.

Desk Review and Calculation of TRM-Based Savings

The Evaluation Team reviewed the TRM 3.0 for formulas and inputs to verify that each of the measures implemented in the AES Program were reasonable. All measures were included in Arkansas TRM 3.0. We used raw data provided by EAI to recalculate savings for each measure and to verify that the implementer applied the TRM algorithms correctly.

For this task, we used project files for prescriptive and custom sites to determine location and building type. We also used equipment quantities, size as listed on the nameplate, efficiency as listed on the nameplate, and hours of operation for both pre- and post-installation conditions to estimate measure-level savings.

We also reviewed supporting documentation to verify that the quantities, wattages, and HOUs were consistent with the database values.

Evaluated Gross Savings Analysis and TRM Review

The Evaluation Team reviewed the TRM for prescriptive measures implemented in the program to verify that TRM formulas and inputs were reasonable. We did not note any significant calculation errors or unreasonable values.

The Team evaluated the census of completed projects. The total evaluated (*ex post*) gross savings for the AES Program is 2,179 MWh, with a demand reduction of 301 kW. The final claimed (*ex ante*) and *ex post* gross energy savings and peak coincident demand reduction estimates are shown in Table 187 and Table 188, respectively.

Table 187. AES Program *Ex Ante* and *Ex Post* Gross Energy Savings*

Measure	*Ex Ante* Energy Savings (MWh)	*Ex Post* Energy Savings (MWh)	Realization Rate
CFLs	83	83	100%
Custom LEDs	1,822	1,822	100%
Custom VFDs in Irrigation	274	274	100%
Total	2,179	2,179	100%

* Gross energy savings are presented net of line loss.

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Table 188. AES Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction*

Measure	*Ex Ante* Demand Reduction (kW)	*Ex Post* Demand Reduction (kW)	Realization Rate
CFLs	46	46	100%
Custom LED	255	255	100%
Custom VFD Irrigation	-	-	-
Total	301	301	100%

* Gross demand reduction is presented net of line loss.

Net-to-Gross Analysis

The Evaluation Team calculated two distinct freeridership rates for AES participants, following the analysis approach outlined in the Evaluation Methodology section of this report. Details specific to AES are outlined below.

Freeridership

As some customers installed more than one program measure, the Team assessed participant freeridership at the measure level rather than at the participant level. We estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- They had pre-existing plans to purchase or install the measure prior to learning about the program,
- Their budget could have accommodated the full cost of the measure, and
- Without the program, they would have installed a program-eligible measure of the same (or higher) efficiency within a year.

Table 189 shows the survey questions we used to assess freeridership for each criterion. The Team then used the three freeridership criteria scores to determine overall program freeridership.

Table 189. AES Program Participant Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans for Measure Installation	Before learning about the EAI AES Program, was your organization already planning to purchase and install the measure in 2013?*
Available Budget	If the program incentive had not been available, how likely is it that your 2013 budget would have included the full cost of the measure?*
Stated Intent	Without the incentive, would you have purchased a measure that had the same level of efficiency, higher efficiency, or lower efficiency?
	Without the incentive, would you have purchased the measure ....(sooner; at the same time; later in the same year; in one or two years; etc.)?

* The Team varied question wording slightly depending on the number of measures installed by the contractor.

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The Evaluation Team asked six participants about nine measures they installed through the program. We identified freerider measures as those that simultaneously met all three criteria. Responses indicated that there was one freerider measure. Accordingly, the participant freeridership rate is estimated to be 11%, as shown in Table 190.

Table 190. AES Program Participant Freeridership Rate

Freeridership Criteria	Percent of Measures that Met Criteria (n=9)*
Prior Plans for Measure Installation	33%
Available Budget	11%
Stated Intent	22%
Freeridership Rate (Percent of measures that met all three criteria)	11%

* Six participants answered freeridership questions about nine AES Program-incented measures.

Because only one measure was identified as a freerider measure, the Evaluation Team did not weight freeridership results by program savings.

Spillover

The Evaluation Team also asked participants about spillover-eligible measures. The Team quantified like-spillover, which is equipment installed outside of the program that is exactly the same type and efficiency as the equipment installed through an EAI program, and where the customer's experience with the program was important to their decision to implement the measures. The following criteria are required for a measure to be considered spillover:

- The service or measure is offered in the program portfolio;
- The customer did not receive a rebate or incentive for the measure;
- The customer's experience with the program was somewhat or very important in their decision to install the measure.[129]

The analysis from participant surveys revealed that there was no spillover among like- and non-like program measures.

The Evaluation Team surveyed nonparticipants to determine if there was spillover among this group. The analysis revealed no evidence of nonparticipant spillover.

[129] The Evaluation Team asked respondents to identify the extent to which the program influenced their non-program sales (contractors) and non-program purchases (participants) using a scale of very important, somewhat important, not very important, and not at all important.

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Evaluated Net Savings

The final evaluated net savings for the AES Program are shown in Table 191. Applying the NTG ratio to the program's evaluated gross savings resulted in evaluated net electricity savings of 1,940 MWh, with a demand reduction of 268 kW.

Table 191. AES Program Evaluated Net Savings

Savings	Evaluated Gross Savings	Net Savings	Net-to-Gross Ratio
Coincident Peak Demand Savings (kW)	301	268	0.89
Annual Energy Savings (MWh)	2,179	1,940	0.89

* kW and MWh savings are presented at the meter and do not include line losses.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Program Performance

Custom LED projects help AES achieve its goals despite low, but improved participation in 2013.

Despite achieving less than 15% of the program participation goal, AES achieved its energy-savings goal, primarily due to the proportionally high rate of custom LED projects installed in 2013. Projects that used LEDs had high reported AOH (averaging 5,616 hours), exceeding the highest deemed hours from the TRM 3.0 (Vol. 2, Sec 3.6.3) as determined by building type. These operating hours were similar to the long hours of a manufacturing facility (5,740 hours) or a fast food restaurant (6,188 hours), which have the potential to produce significant energy savings as a result of high use. Thus, the custom LED sites had proportionally higher MWh savings per site than planned for when creating the goals.

AES failed to meet its demand-reduction target, despite the fact that custom LED and CFL projects produced proportionally more demand reductions per project than planned for when creating the goals. Table 192 breaks down program goals and achievements by participant at a measure level to demonstrate the proportionally higher savings produced by the predominant measures installed in 2013.

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Table 192. Savings per Participant Analysis*

	Goals	CFL**	Custom LED**	Custom VFD Irrigation**
Participants	150***	7	18	4
Energy Savings (MWh)	1,304	83	1,822	274
Demand Savings (kW)	400	46	255	0
Energy Savings/Participant (MWh/site)	8.7	11.9	101.2	68.5
Demand Savings/Participant (kW/site)	2.7	6.6	14.2	0.0
Average Delta Watts of Lamp	-	77	78	-
Average Annual Operating Hours	-	1,425	5,616	-
Average Lamp Quantity per Site	-	111	237	-

* For this analysis, the Team counted the number of participants who installed CFLs, custom LEDs, and custom VFD irrigation measures as the number of unique project IDs.

** MWh and kW savings are presented at the meter and do not include line losses.

*** The Team identified the goal for participants as the number of unique site addresses.

Program Design

Farmers are motivated to save energy and money, but lack of time and access to funding continue to be major participation barriers.

Five of six surveyed participants indicated that saving money on electric bills was an important factor in their decision to participate. Nearly all nonparticipants (nine of 10) indicated being very interested or somewhat interested in saving energy at their facility. The majority of nonparticipants (eight of 10) said they were motivated to save energy because it could save them money.

Program staff identified projects' initial cost as a major participation barrier. Two of three nonparticipant farmers who said they faced challenges saving energy noted project cost as a barrier; one of whom said they lack the time to complete upgrades. Despite these challenges, program staff noted that farmers grasp the value of the program once program staff has the opportunity to discuss project options. Staff also noted that the payback period for lighting projects is often shorter than farmers expect.

Tailoring measures to farm sector needs created compelling new opportunities for customers to participate and helped diversify measure uptake.

For example, the lighting used in chicken coops affects the chickens' growth and comfort. With an understanding of poultry farmers' needs, the implementer added new lighting measures to the AES Program in 2013. Participating farmers reported that the expanded lamp selection in 2013 (i.e., the inclusion of 4,100 kelvin CFLs and LEDs)[130] was a better match for their flocks. Farmers also gravitated

[130] Program and implementation staff consulted with the Evaluation Team prior to LED project approval to ensure the bulb selection meets energy-efficiency criteria.

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toward the new LED option in 2013 because LEDs are more widely available, are easily installed by the farmer into existing sockets, and pay for themselves within three to four months (per flock).[131]

Additionally, while program staff targeted poultry and hog farmers for lighting projects, row crop farms offer energy-saving opportunities by installing variable frequency drives (VFDs). Staff reported that most row croppers recovered from the 2012 drought in 2013 and expressed interest in VFDs. The program completed its first VFD projects in 2013. Two of 27 projects included VFDs; the remainder were installations of CFLs and LEDs. In the future, program and implementation staff said they would like to promote VFDs more heavily to the poultry segment to expand savings opportunities from this measure and assist with ventilation costs.

Marketing and Outreach

Leveraging trade ally relationships helped broaden and enhance program awareness.

AES Program trade allies consist of suppliers (light bulbs, motors, or other farm equipment) and service technicians from large food industry customers. These organizations are not part of a formal trade ally network; farmers can choose any contractor or install equipment themselves. However, the service technicians and supply stores have longstanding relationships with farmers that date back generations in many cases.

To recruit and educate trade allies as recommended in the 2012 evaluation, implementation staff leveraged the support of agricultural stakeholders by meeting with groups of poultry service technicians around the state. Staff educated service technicians about the program and provided them with program materials to distribute. Each service technician managed approximately 20 farms, and implementation staff reported that they generated numerous customer leads. This strategy has proved more efficient than having the field manager meet with individual farmers.

Participant surveys further confirmed that increased program focus on trade allies enhanced program awareness overall. Five of six surveyed participant farmers said they learned about the program through a trade ally, program staff person, or word-of-mouth from other farmers. One program manager stated: "It's amazing how much [farmers] talk to other people." As recommended in the 2012 evaluation, staff said they focused on providing program education to service technicians and equipment suppliers who could then discuss the program with existing customers, and therefore generate program leads.

Nonparticipants also reported that word-of-mouth was a key factor in how they learned about EAI's energy-efficiency programs. For example, four of 10 surveyed nonparticipant farmers said they were aware that EAI offered energy-efficiency programs for commercial customers, and two of the four said they were familiar with the AES Program. In addition, the majority of nonparticipants (six of eight) also indicated direct mail as a good way to notify them of program opportunities.[132]

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[131] Four of six farmers who responded to the survey said they installed the lighting equipment themselves.

[132] Two of eight said they prefer email and one prefers to receive a phone call from program staff.

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A comprehensive outreach strategy allowed staff to reach a broad audience.

Program staff acknowledged that they wasted time in 2012 attempting to promote the program to farmers during harvest. In 2013, Staff noted that the program started gaining traction in the farming community after implementing several new marketing and outreach strategies that had a positive cumulative effect on the program's ability to achieve it energy savings goals.

- As recommended in the 2012 evaluation, program staff timed marketing activities before and after harvest.
- ICF added an implementation field manager to its program team who is familiar with the farming industry. Staff emphasized that having a program representative who "speaks the language" was an important change to increase farmers' trust in the program.
- Implementation staff reported making substantial efforts to cultivate connections with trade allies who have longstanding relationships with potential AES customers, as described in detail above.
- The program developed a strong pipeline of projects due to referrals from participant farmers and the program's strong financial case to provide farmers with a short payback period on lighting projects.

Program Delivery and Implementation

The personalized program services and on-site education contributed to measure diversity and customer satisfaction.

As in 2012, the 2013 AES Program offered participants a flexible approach through a prescriptive or custom track. Program staff provided participants with technical assistance, education about eligible measures and payback periods, and farm audits. During a pre-inspection, implementation staff identified opportunities for energy-saving upgrades at the farmer's facility. Typically, lighting accounts for 20% of a farmer's electricity costs, on average; therefore program staff focus on lighting opportunities as a first step for farmers. However, as described previously, program staff contended that VFDs offer additional savings opportunities for row crop and poultry farmers, and said they saw some uptake of this measure in 2013. They plan to increase their focus on VFDs to targeted farming segments in future years.

Program staff also provide participants with information about the complementary EAI solutions programs, as well as about NRCS and Extension Service programs.

The implementers' personalized services to farmers not only helped to modestly improve the diversity of measure installations in 2013, but also contributed to high customer satisfaction ratings among participants, as described in greater detail below.

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Customer Satisfaction

Participants were satisfied with all aspects of the AES Program.

Five of six surveyed participants said they were very satisfied with the program overall. One of six was somewhat satisfied; this respondent cited the length of time it took to receive the rebate as his reason for this rating. Participants expressed satisfaction with the following program features:

- All six participants stated they were very satisfied with the application process.
- Five of six participants said they were very satisfied with the incentive amount provided.
- Five of six participants said they were very satisfied with the selection of eligible equipment.
- Five of six participants said they were very satisfied with the information and technical support received.
- Five of six participants said they were very satisfied with the performance of the upgraded equipment.

Participants were less satisfied with the speed at which they received their incentive: one of six was very satisfied, four of six were somewhat satisfied, and one was not at all satisfied.

Additionally, four of six farmers said they were very satisfied with EAI as an electric service provider, while two of six were somewhat satisfied.

One participant was so pleased with his experience in the program that he approached staff about providing a testimonial. The farmer, who was awarded *Arkansas Farm Family of the Year* in 2012, is now featured in an EAI Solutions commercial that airs during football games.

TRM

The TRM's agriculture use exception path increased the program savings.

TRM 3.0 (Vol. 2, Sec 3.6.3) specifies that LED lamps must be ENERGY STAR-approved with an exception made for an agricultural animal use setting, where the lamp must be reviewed by the program evaluator. As part of our 2013 program support efforts, the Team assessed several non-ENERGY STAR-approved LEDs. One of the lamps we evaluated is used in poultry houses and has a correlated color temperature (CCT) outside of the warm/cool color appearance range specified by the current ENERGY STAR guidelines. The lamp meets the remainder of the guidelines. Research has shown lamps with this CCT improve poultry behavior, health, and economics. The Evaluation Team approved this individual lamp through the TRM exception path, and over 2,800 were installed at 10 sites and produced more than 1,200 MWh of savings.

Data Tracking and Reporting

Key project variables needed for our evaluation were lost during the data transfer process.

Some prescriptive and most custom projects' details were lost when the program implementer transferred project data from their internal tracking database to the EAI ArchEE database. The Evaluation Team was able to recalculate the prescriptive CFL lighting projects after confirming a few

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common assumptions. In the future if EAI or the implementer provides the following details, we can make small modifications to the database and recalculate the savings to be more accurate:

- The CF field was blank in ArchEE, so the Evaluation Team used the Warehouse Non-Refrigerated CF 0.77 building type as a proxy for poultry houses.
- Columns labeled "kW Existing" and "kW New" appeared to be the pre- and post-wattages of the same lamp type, shown in watts.
- The CFL prescriptive quantity column was populated with the number of CFLs installed, while the LED custom quantity listed the quantity as one (i.e., one custom project). The Evaluation Team reviewed individual project files to determine the actual number of LEDs installed.

A few small improvements to the database to capture all the components needed for evaluation would improve evaluation efficiency and eliminate the need for the Evaluation Team to access additional specific project file documentation from the implementer. Additionally, EAI may benefit from having access to data that captures more project details in one place, as it would allow program staff to conduct internal assessments and better track installation rates and program progress.

Stable accounting of completed projects would enable a more efficient year-end evaluation.

The implementer added nearly 30% more projects to the EAI ArchEE database after the deadline for year-end program data had past and the Team had completed our analysis. We conducted our analysis a second time, in order to include additional projects that had been completed in the final two months of 2013.

Evaluation Recommendations

The Evaluation Team did not identify any program-specific recommendations in 2013.

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Residential Direct Load Control Program

Res DLC is a demand-response program that targets single-family residential customers in EAI's service territory with at least one CAC or air-source heat pump HVAC system installed in their home. The Res DLC Program is marketed under the name "Summer Advantage Program" in customer-facing material and is implemented by Comverge.[133] Comverge is responsible for program marketing, call center support, DCU installation, incentive tracking and payment, and internal M&V.

The Res DLC Program objective is to reduce peak summer demand (kW). Comverge installs a DCU on or near the exterior equipment of participating customers' HVAC systems. The DCU device allows EAI to remotely cycle off the HVAC system's compressor during times of peak demand.

Customers choose between two cycling options when enrolling in the program: 50% and 75%. When EAI calls for a reduction in demand (known as a dispatch event), the DCU reduces the run time of the HVAC system compressor by 50% or 75% of the average run time used in the hour preceding the event. The system fan continues uninterrupted to circulate air throughout the home. The percentage of run time reduction and the incentive amount depend on the cycling option the participant selects (Table 193). [134]

Table 193. Res DLC Program Incentive Options

	50% Cycling Option	75% Cycling Option
One-time installation incentive	$25	$40
Reoccurring annual "Thank You" check	$25	$40

The DCU device develops and adapts to an algorithm that summarizes the amount of energy that particular HVAC system uses over time. Customers receive an incentive following the installation of the DCU and an additional incentive for each year they participate. Once the DCU is installed, the customer continues to participate until they request to be removed from the program or the program is modified or terminated.

Per their contract with EAI, Comverge is responsible for installing M&V systems (the Comverge IntelliMEASURE M&V system) which combines OEM hardware and a proprietary curtailment algorithm along with a Comverge DCU. The M&V system records five-minute interval data for analysis of curtailment events.

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133 Comverge is an energy services company specializing in demand response, smart grid, and energy management program implementation across residential, commercial, and industrial market segments. http://www.comverge.com/

134 The system fan continues uninterrupted, regardless of cycle selected, to circulate air and help maintain home comfort.

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Program Status Overview

The Res DLC Program was a new addition to the EAI energy-efficiency portfolio in 2012. In 2013, EAI called three events that took place on June 13, July 10, and August 7. EAI also called two additional events for customers included in Comverge's M&V sample.[135]

To achieve 2013 demand reduction goals, Comverge had a DCU installation goal of 12,000 units by the end of the 2013 calendar year. This goal represents a downward adjustment to EAI's filed participation goal of 15,003 units in 2013. The program nearly achieved the revised goal; Comverge installed 8,991 DCUs between the last curtailment event in 2012 on September 5 and the last curtailment event in 2013 on August 7 and ended the year with 11,935 active DCUs.

Additionally, due to strong customer interest in the program, EAI increased its internal 2013 demand reduction target to 14.6 MW. Despite just missing its participation goal by 20% and falling short of the revised internal demand reduction target by 11%, EAI surpassed its filed demand reduction target by a significant margin achieving 251% of EAI's 2013 goal (Table 194).

Table 194. Res DLC Program Goals and Achieved Demand Reductions

	Goal	Actual	Percent of Goal Achieved
Demand Savings (MW)*	5.209	13.063	251%
Participation (customers)	15,003	11,935	80%
Budget	$3,417,117	$3,221,531	94%

*MW actual represents evaluated net savings and reflect the application of a 1.0849 line loss factor.

In 2013, Comverge increased the number of metered M&V sites from 25 to 120 to ensure the sample stratification continued to reflect the characteristics of the DCU population which increased significantly throughout 2012.[136] Comverge selected a random sample of M&V customers based on a curtailment strategy of having 60 participants at 50% curtailment and 60 participants at 75% curtailment.

Arkansas had a cooler than average curtailment season, which limited dispatch events. According to weather data from the Little Rock Airport, the average temperature on event days in 2013 was around 4

[135] Customers in the M&V sample had additional metering equipment installed with their DCUs to record energy usage before, during, and after dispatch events. These energy-usage data were used by the program implementer and the Evaluation Team to quantify the magnitude of program demand reductions.

[136] Comverge based the distribution of M&V equipment installation 25 sites in 2012 on 403 participating DCUs installed as of July 11, 2012. The 95 M&V sites added in 2013 were determined based on 7,579 participating DCUs installed as of December 31, 2012.

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degrees less than 2012 (85°F v. 89°F).[137] In spite of the cooler weather, the program still far exceeded its goal.

Status of 2012 Evaluation Recommendations

Table 195 lists the status of each of the Res DLC Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed nearly all of the 2012 Res DLC Program recommendations during the 2013 program year.

Table 195. 2013 Status of 2012 Res DLC Program Recommendations

2012 Recommendation	2013 Status
Prior to summer 2013, monitor the number of devices installed to ensure they are sufficient to produce the desired demand reduction. If sufficient devices have not been installed by May 1 to meet the 2013 demand reduction goal, increase marketing and outreach to attract more customers into the program prior to the summer curtailment season.	*Completed.* Comverge reported 11,143 active devices by May 31, 2013.
Consider increasing the program goals and budgets to reflect customer interest in the program and to compensate for the later program launch.	*Completed.* Program staff increased the program demand goal and budget to reflect revised program goals.
Maintain the current resource allocations for the Res DLC Program, but respond to any changes in the 2013 program goals with an appropriate increase in program funding and staffing.	
Work with the implementer to review the marketing collateral and ensure the information clearly articulates that Summer Advantage is a demand response program. Add information to describe why demand response benefits the utility and the customer overall (e.g., reduces the need for additional power plants).	*Completed.* Program staff revised the program websites and marketing materials to clearly outline program processes and what participants should expect with participation.
Review internal procedures to ensure that staff are prepared to address participant concerns about their overall energy usage, specifically why it may not have decreased despite program participation.	*Completed.* Program staff developed a clarifying email, which was sent to the EAI call center to help staff effectively respond to customer questions or concerns about the Res DLC Program.
To continue to build customer awareness and interest, focus on marketing strategies that rely on direct mail.	*In Progress/Partial.* Comverge plans to develop additional direct mail marketing campaigns and collateral should additional program recruitment be required in 2014.

[137] NOAA National Climate Data Center. http://www7.ncdc.noaa.gov/CDO/cdodateoutmod.cmd

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2012 Recommendation	2013 Status
Consider reducing or eliminating in-person marketing activities and diverting those resources to direct mail initiatives and website enhancements.	*Completed.* The program marketing plan includes door-to-door single-family marketing, meeting with multifamily property owners and operators, and in-person meetings with HVAC installers as potential marketing options, but staff did not execute these tactics in 2013 and do not plan to leverage these channels moving forward.
Consider adding real success stories, customer quotes, images, and videos to the website to make it more visually appealing.	*Completed.* Program staff revised program websites to incorporate these recommendations
Make the call-to-action on the webpage very obvious by using a 3D button or placing it higher on the page, above the fold.	
Standardize the website URLs used in marketing materials.	
Use a program-specific web address on marketing materials so the reader can quickly find program information. Reducing barriers to finding information will lead to greater program participation.	
Implement a marketing metrics tracking plan. This will also allow EAI to track webpage visitors and measure the effectiveness of program marketing materials.	
Add details about how the online participation process works (e.g., "*it's easy, here's a step-by-step guide*").	
Make the fact sheet more prominent on the page and rename it. Not everyone understands "FAQ."	
Avoid industry jargon, such as measures or incentive. Confirm that the website and all marketing materials reflect language a potential customer would understand.	
In program messaging, emphasize the program's minor impact on home comfort, using testimonials from current participants.	*Completed.* Program staff updated the program website and marketing materials to clearly outline program processes and what to expect with participation.
Work with the implementer to develop a clearly articulated set of post-installation on-site QA protocols for the Res DLC Program.	*Completed.* Program staff updated the 2013 program manual to include on-site QA protocols such as: sampling, roles and responsibilities, and elements inspected.
EAI staff should continue ride-alongs and independent inspections to verify the quality of DCU installations.	*Completed.* Program staff attempted to participate in 10% of the QA inspections Converge preforms on its own work.
Maintain the program's commitment to overall	*Completed.* Program staff are committed to quarterly

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2012 Recommendation	2013 Status
customer satisfaction.	program meetings to ensure the program remains abreast of customer needs.
Continue or increase the emphasis on customer satisfaction in program marketing materials.	*In Progress/Partial.* EAI and Comverge are developing a customer satisfaction survey and will solicit customer testimonials.
Review, update, and finalize the program manual for the 2013 year.	*Completed.* Program and implementation staff developed a revised manual for the 2013 program year.

Analysis Methodology

For the Res DLC 2013 evaluation, the Evaluation Team conducted the following data collection and analysis tasks.[138]

- Data Collection Interviews
  - Utility Program Manager (n=1)
  - Program Implementation Manager (n=1)
- Year End Interview
  - Utility Program Manager (n=1)
- Participant Surveys (n=71)[139]
- Materials Review
- Baseline Estimation
- Impact Analysis (Gross Savings)

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the Res DLC Program that consisted of a baseline estimation and gross savings evaluation. The data for our analysis were from 120 randomly assigned interval meters, installed for EM&V purposes. The Evaluation Team did not verify M&V meter installation.

[138] The Evaluation Team conducted a full process evaluation of the Res DLC Program.

[139] The program target was to complete 70 surveys. The Evaluation Team completed one additional survey because multiple interviewers conducted surveys simultaneously.

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The Res DLC Program exceeded its demand savings goal of 5.209 MW by 151%, based on evaluated gross savings. Table 196 shows the program demand reduction goal compared to the net evaluated demand reduction. The net evaluated demand reduction was adjusted by a line loss factor of 8.49%.

Table 196. Res DLC Program Demand Reduction Goal and the Net Evaluated Demand Reduction

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction (MW)	Percent of Demand Goal Achieved
5.209	13.063	251%

* Demand reduction reflects the application of a 1.0849 line loss factor.

Methodology

Verification of the Maximum Reduction – Symmetric Multiplicative Adjusted Baseline

The Evaluation Team verified Comverge's maximum reduction evaluation algorithm, outlined in Comverge's contract and in the *Entergy Measurement and Verification Plan 2013.* This consisted of a symmetric multiplicative adjustment relative to baseline savings, averaged across all sites in 15-minute intervals. Symmetric adjustments allow baselines to be adjusted up or down, as opposed to asymmetric adjustments that only allow baselines to be adjusted up. Comverge's approach relied on the following equations:

$$Adjustment\ Factor = \frac{PreEvent\ Baseline\ Load}{PreEvent\ Load}$$

$$Adjusted\ Baseline\ Load = Adjustment\ Factor \times Baseline\ Load$$

$$Curtailed\ Load = Adjusted\ Baseline\ Load - Event\ Load$$

$$Maximum\ Curtailed\ Load = Maximum\ 15\ Minute\ Reduction \times Installed\ End\ Point$$

Where:

PreEvent Baseline Load	=	The average load of the four highest energy-usage days out of five similar days prior to the event, during the hour prior to the start of the event hour (not including weekends, holidays, event days, or test event days)
PreEvent Load	=	The load extending for the hour prior to the start of the event hour on the event day
Baseline Load	=	The average load during the hours of the event on the four highest energy-usage days out of the five days prior to the event (not including weekends, holidays, event days, or test event days)
Event Load	=	The load during the curtailment event

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Maximum 15 Minute Reduction	=	The maximum reduction achieved for any 15-minute event interval averaged across all sites
Installed End Points	=	The number of installed end points by the end of the curtailment season

Qualifying settlement event hours included those from all events, including test events with temperatures greater than or equal to 95 degrees Fahrenheit as measured at the Little Rock International Airport.

Estimation of the Evaluated Gross Demand Reductions – Symmetric Additive Adjusted Baseline

The Evaluation Team estimated evaluated gross demand reductions by using a symmetric additive adjustment relative to baseline savings. The Team explored the various methods of baseline approaches during our 2012 evaluation activities, specifically the multiplicative adjustments, asymmetric adjustments, and weather sensitive or regression adjustments, no adjustments, and a maximum baseload analysis.

The Evaluation Team determined that a symmetric additive adjustment provides the most appropriate and accurate estimates of demand reduction for the Res DLC Program. This approach is less volatile than a multiplicative adjustment, which can produce unrealistically large adjustments when, for instance, equipment is not running during baseline pre-event hours. The constraints of a weather-sensitive adjustment attempt to deal with this problem, but we found the constraints arbitrary. A symmetric additive adjustment produces reasonable adjustments without arbitrary constraints.

The Evaluation Team used the following equations, using five-minute interval data for each site:

$$Adjustment\ Factor = PreEvent\ Load - PreEvent\ Baseline\ Load$$

$$Adjusted\ Baseline\ Load = Adjustment\ Factor + Baseline\ Load$$

$$Curtailed\ Load = Adjusted\ Baseline\ Load - Event\ Load$$

$$Average_{Season}\ Curtailed\ Load = \frac{\sum_{i=1}^{n} Average_{Event}\ Curtailed\ Load_i \times Installed\ End\ Points_i}{n}$$

Where:

PreEvent Load	=	The load extending for the hour prior to the start of the event hour on the event day
PreEvent Baseline Load	=	The average load across four surrounding days (not including weekends, holidays, event days, or test event days) extending to the hour prior to the event hour

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Baseline Load	=	The average load across four surrounding days (not including weekends, holidays, event days, or test event days) extending to the hours of the event
Event Load	=	The load during the curtailment event
i	=	The event
AverageEvent Curtailed Load	=	The average reduction across all sites by event
Installed End Points	=	The number of installed end points by the end of the curtailment season

The qualifying event hours only included real events, not test events. The program demand savings for a single participant in a given event hour is the difference between the participant's actual demand during that hour and the demand that *would have occurred* without the program, also known as the baseline demand.

Table 197 compares key components of Comverge's baseline analysis methodology to the Evaluation Team's approach. The bolded text highlights the main differences.

Table 197. Comparison of Evaluation Team and Implementer Analyses

Component of Analysis	Comverge	The Evaluation Team
Qualifying Event Hours	All events (including test events) with temperatures greater than or equal to 95 degrees Fahrenheit	All events excluding test events and without regard to temperature
Pre-Event Baseline Load	Average load on the four highest energy usage days out of five similar days prior to the event, during the hour prior to the start of the event hour (not including weekends, holidays, event days, or test event days)	Average load across four surrounding days (not including weekends, holidays, event days, or test event days) extending to the hour prior to the event hour
Pre-Event Load	Extending for the hour prior to the start of the event hour on the event day	
Adjustment Factor	Multiplicative - Calculated by dividing the pre-event load by the pre-event baseline load	Additive - Calculated as the difference between the pre-event baseline load and the pre-event load
Baseline Load	Calculated as the average load on the four highest energy-usage days out of five similar days prior to the event (not including weekends, holidays, event days, or test event days)	Calculated as the average load across four surrounding days (not including weekends, holidays, event days, or test event days) extending to the hours of the event
Adjusted Baseline Load	Calculated by multiplying the baseline load (averaged across all sites) by the adjustment factor	Calculated as the sum of the adjustment factor and the baseline load
Event Load	Energy demand during the curtailment event	
Curtailed Load	The difference between the adjusted baseline load and the event load	

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Component of Analysis	Comverge	The Evaluation Team
Order of Averaging	Average across all sites prior to the baseline analysis, converting from five-minute load data into 15-minute intervals	Average across all sites after the baseline analysis, converting from five-minute load data into 15-minute intervals
Final Curtailed kW Calculation	Calculated as the maximum 15-minute reduction for the season based on qualifying event hours multiplied by the total installed end points	Calculated as the average reduction across all sites multiplied by the number of installed end points for each event, weighted by the average total kW across all events.

Evaluated Gross Savings

There were three event days during the 2013 curtailment season: June 13, 2013 from 4:00 p.m. to 5:00 p.m.; July 10, 2013 from 2:00 p.m. to 6:00 p.m.; and August 7, 2013 from 2:00 p.m. to 6:00 p.m., in addition to two test events. Table 198 shows all events, their duration, and the type. For this evaluation, the Team only considered the real event dates and excluded test events from our analysis.

Table 198. 2013 Curtailment Season Events

Date	Start Time (CDT)	End Time (CDT)	Type
June 13, 2013	4:00 p.m.	5:00 p.m.	Event
July 10, 2013	2:00 p.m.	6:00 p.m.	Event
August 6, 2013	3:00 p.m.	3:15 p.m.	Test Event
August 7, 2013	2:00 p.m.	6:00 p.m.	Event
September 12, 2013	4:00 p.m.	5:00 p.m.	Test Event

By the time EAI called its first 2013 event on June 13, Comverge had installed DCUs on 11,438 participating units. By July 10, the date of the second event, the implementer had installed 11,627 DCUs. By August 7, the final event, there were 11,676 active DCUs installed. Table 199 shows the number of active DCUs per event.

Table 199. 2013 Curtailment Season Active DCUs

Event Date	Active Devices
June 13, 2013	11,438
July 10, 2013	11,627
August 7, 2013	11,676

Comverge estimated that the maximum 15-minute reduction for the 2013 curtailment season (based on qualifying hours with temperatures equal to or above 95 degrees Fahrenheit) was 1.38 kW per device. As shown in Table 200, this maximum 15-minute interval took place on July 10, 2013 from 4:00 p.m. to 5:00 p.m. Using this maximum 15-minute interval, the implementer calculated 16.1 MW of total demand response reduction based on their recorded total installed end points of 11,691 throughout the

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EAI service area. The Team verified the implementer's maximum reduction evaluation algorithm and achieved the same results by following the step-by-step methodology outlined in Comverge's contract and in the *Entergy Measurement and Verification Plan 2013.*

Using the systematic additive adjustment baseline method, the average demand reduction per participant, per event hour was 1.04 kW. To produce the total kW reduction per event, the Evaluation Team calculated the average kW curtailed per event multiplied by the number of units active at the time of the event. Then, we weighted the kW reduction results for each event by the number of hours in the event to determine the total average 12.0 MW curtailed for the season.

Table 200 shows the reduction values for each event hour and compares the results of the implementer's maximum 15-minute method with the Evaluation Team's method. As expected, the Evaluation Team's estimates are consistently lower than the implementer's because of the implementer taking the maximum 15-minute reduction for each hour, and the Evaluation Team taking the average across the hour. These savings were estimated at the point-of-use and thus do not include line losses.

Table 200. Hourly Reduction Estimation Using Different Methods

Event	Start Time (CDT)	End Time (CDT)	Comverge Max 15-Minute Method (kW)	Evaluator Average Method (kW)
June 13, 2013*	4:00 p.m.	5:00 p.m.	1.21	0.96
July 10, 2013*	2:00 p.m.	3:00 p.m.	1.08	0.79
July 10, 2013*	3:00 p.m.	4:00 p.m.	1.32	1.10
July 10, 2013*	4:00 p.m.	5:00 p.m.	1.38	1.10
July 10, 2013	5:00 p.m.	6:00 p.m.	1.50	1.22
August 7, 2013	2:00 p.m.	3:00 p.m.	1.21	0.90
August 7, 2013	3:00 p.m.	4:00 p.m.	1.19	1.07
August 7, 2013	4:00 p.m.	5:00 p.m.	1.32	1.08
August 7, 2013	5:00 p.m.	6:00 p.m.	1.30	1.10

Table 201 shows the evaluated average demand reduction. These savings were estimated at the point-of-use and thus do not include line losses.

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Table 201. Evaluated Average Demand Reduction

Event	Start Time (CDT)	End Time (CDT)	Evaluator Average Method (kW)	Average kW per Event	Active DCUs	Total kW per Event*
June 13, 2013	4:00 p.m.	5:00 p.m.	0.96	0.96	11,438	11,031
July 10, 2013	2:00 p.m.	3:00 p.m.	0.79	1.05	11,627	12,240
July 10, 2013	3:00 p.m.	4:00 p.m.	1.10			
July 10, 2013	4:00 p.m.	5:00 p.m.	1.10			
July 10, 2013	5:00 p.m.	6:00 p.m.	1.22			
August 7, 2013	2:00 p.m.	3:00 p.m.	0.90	1.04	11,676	12,094
August 7, 2013	3:00 p.m.	4:00 p.m.	1.07			
August 7, 2013	4:00 p.m.	5:00 p.m.	1.08			
August 7, 2013	5:00 p.m.	6:00 p.m.	1.10			
Average kW Savings			1.04	Weighted kW Total		12,041

* Totals may not sum due to rounding.

Table 202 shows the total program impact, which the Team calculated as the participant-weighted average demand reduction across event hours. The evaluated gross demand reduction was 12.0 MW. As savings were estimated at the point-of-use, they do not include line losses.

Table 202. Res DLC Program Reported Gross and Evaluated Gross Demand Reduction

Measure	Reported Gross Demand Reduction (MW)	Evaluated Gross Demand Reduction (MW)	Realization Rate
Res DLC	N/A	12.0	N/A

Table 203 quantifies the difference between the Evaluation Team and implementer estimates of demand reduction by two main driving forces: 1) variation in baseline day calculations and 2) the type of adjustment factor used.

Table 203. Differences Between Reported Gross and Evaluated Gross Demand Reduction

	Demand Reduction (kW)*
Comverge's Maximum Reduction	16,134
The Evaluation Team's Average Reduction	12,041
Total Difference	4,093
Difference due to variations in baseline day calculation (maximum v. average) and in adjustment factors (multiplicative v. additive)	2,831
Difference due to Comverge multiplying the maximum 15-minute kW reduction by the total DCUs installed at the end of the season versus the Evaluation Team multiplying the average kW reduction by the active DCUs per event	1,262

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Evaluated Net Savings

We assumed that all estimated reductions in demand are attributable to the program, equating to a NTG ratio of 1.0. There can be no expectation that demand reduction would have occurred, timed to the event days and event hours, without the effect of the program.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Program Performance

The difference in savings achieved by each of the two cycling groups is not as large as expected and may not align appropriately with the current tiers of incentives.

The Evaluation Team considered the impacts from the 50% and 75% cycling groups and found that the 75% cycling group only saved about 10% more kW per hour than the 50% cycling group. The expected increase in savings between the 75% cycling group and the 50% cycling group is 50%. Further, when the number of participants per cycling group was factored in, the contribution to the overall savings from each cycling group was nearly identical with the 50% cycling group making up 49% of savings and the 75% cycling group comprising 51% of savings.

It's possible that the population that is currently enrolled in the 75% cycling group tends to use less energy than the population enrolled in the 50% cycling group. Even so, the current incentive structure is such that the 75% cycling group receives 60% more in incentives than the 50% cycling group ($80 v. $50). This already includes an extra 10% increase in incentives for the 75% cycling group from a purely proportional savings to incentive standpoint. When considering the actual achieved contribution to savings, the proportional alignment to the incentives for each group diverges even more.

Program Design

The program's minimum daily temperature threshold limited the number of days dispatch events could be called.

According to interviews with program staff, Comverge only calls full dispatch events for the Res DLC Program on days when the temperature at the Little Rock International Airport is expected to reach or exceed 95 degrees Fahrenheit:[140] this ensures that dispatch events happen during peak load periods. As shown in Figure 83 and Table 204, this program requirement and atypically cool weather conditions meant that less than half as many days were eligible for dispatch events in 2013 as in 2012.

[140] As measured by the National Weather Service.

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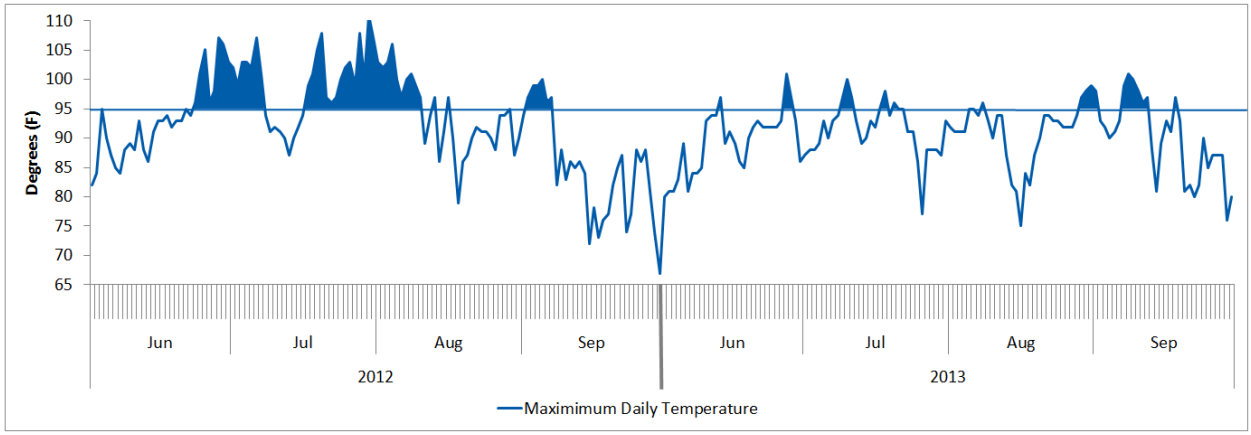
Figure 83. Daily Minimum and Maximum Temperatures During the 2012 and 2013 Curtailment Seasons



National Oceanic and Atmospheric Administration, National Climate Data Center. Maximum temperature (tenths of degrees C) from station: GHCND: USW00013963 - Little Rock Airport Adams Field, AR US.

Table 204. Days with a Maximum Recorded Temperature Over 95°F During the 2012 and 2013 Curtailment Seasons

	2012	2013
Days Over 95 Degrees Fahrenheit	48	20

The program maintains rigorous QA and M&V processes.

As recommended in the 2012 evaluation, program staff modified the program manual for the 2013 program year to include explicit protocols (i.e., number of sites selected for inspection, items reviewed) for internal on-site QA inspections. Further, both Comverge and EAI implemented overarching company policies that mandated QA activities for all energy-efficiency and demand reduction programs.

In 2013, the Comverge DCU installation and maintenance field supervisor inspected approximately 5% of all DCUs installed by experienced field staff and between 15% and 20% of DCUs installed by new technicians. To verify this work, the EAI program manager conducted ride-alongs on approximately 10%, or between 30 and 40 of Comverge's 2013 inspections.

The program implementer conducted a number of M&V activities throughout the curtailment season, beginning with the selection of M&V sites and system readiness checks and culminating in the determination of program demand reductions following the curtailment season. The M&V sample was increased from 25 in 2012 to 120 in 2013, based on the Evaluation Team's recommendation. We selected an M&V sample size of 120 in order to provide an estimate of the demand reduction impacts with an acceptable level of confidence and precision. The M&V sample consists of households that have interval meters installed in addition to the DCU, allowing for capturing data on the energy use of the HVAC equipment. Comverge and the Evaluation Team analyzed this data to estimate the demand

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reduction achieved when events are called. Table 205 provides a summary of the significant M&V activities conducted during each phase of program implementation.

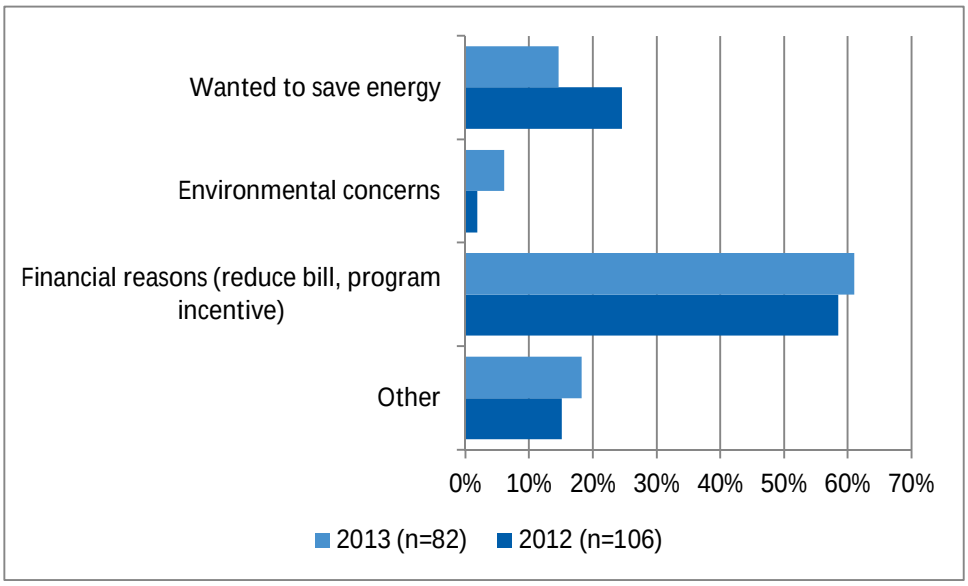
Table 205. Comverge Res DLC M&V Activities

Pre-curtailment season activities	Curtailment season activities	Post-curtailment season activities
Determine M&V participants	Implement M&V sample plan	Check data for accuracy
Install M&V equipment	Verify data	Draft curtailment season summary report
Perform system readiness tests	Determine events	Present findings to EAI
Estimate load reduction potential	Analyze event results	
Conduct trainings as necessary		

Saving money is the primary customer motivation for enrolling in the Res DLC Program.

As indicated in Figure 84, 2013 survey respondents cited the program's financial benefits as the most common reason for their participation. In addition, fewer 2013 survey respondents cited the desire to save energy as a motivating factor: approximately 25% of 2012 participants (26 of 106) reported enrolling in the program to save energy, compared to 15% of 2013 respondents (12 of 82).[141]

Figure 84. Reasons Cited by Customers for Participating in Res DLC Program



C1. Why did you decide to participate in the program? (n=82; multiple responses accepted, don't know and refused answers were removed)

Marketing and Outreach

Direct mail was the most effective way to communicate with customers.

In 2013, staff focused program marketing on direct mail. The program implementer reported having success with this approach for direct load control programs in other jurisdictions, and 2012 evaluation

[141] This result is statistically significant at the 90% confidence level (p=0.05).

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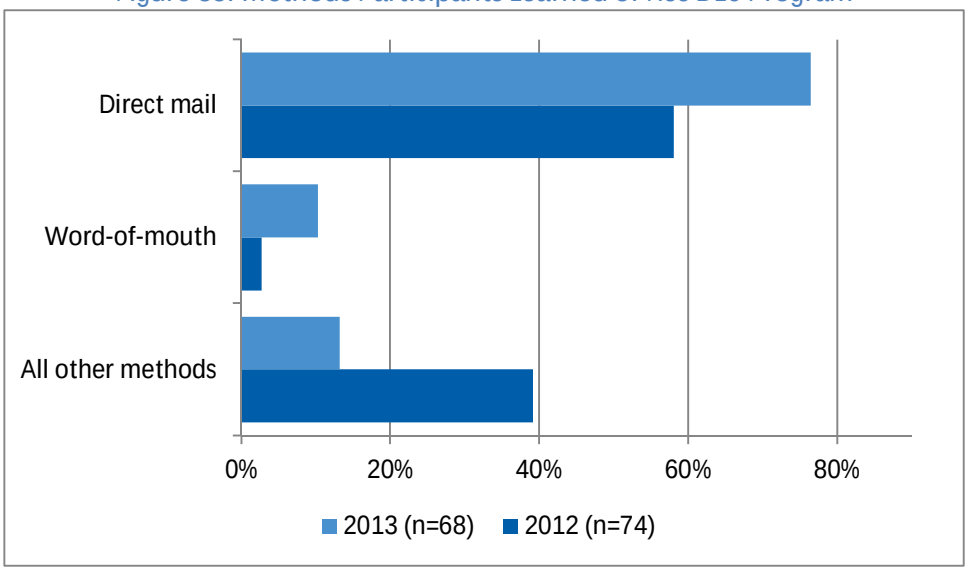
results indicated that customers respond positively to this approach. 2013 survey results corroborated that this marketing channel is the most effective. When asked, 96% of 2013 survey respondents (68 of 71) could recall how they first learned of the program. Of these, 77% first became aware of the program through direct mail (52 of 86; Figure 85).[142]

Figure 85. Methods Participants Learned of Res DLC Program



B1. How did you hear about the Entergy Arkansas' Summer Advantage Program? (n=68; don't know and refused answers were removed)

Administrative Processes

Res DLC program management transitioned smoothly to new EAI staff in 2013.

In fall 2013, new EAI staff took over Res DLC Program management. According to program staff, the transition benefitted from three key considerations. First, the transition began after the curtailment season to allow new staff to learn program protocols. Second, outgoing program staff remained in place during the early stages of the transition to provide guidance. Third, the new staff have extensive experience with demand reduction program management through their ongoing management of another demand reduction program in EAI's energy-efficiency program portfolio.

[142] This is a statistically significant increase over 2012 participant survey results at the 90% confidence level (p=0.01).

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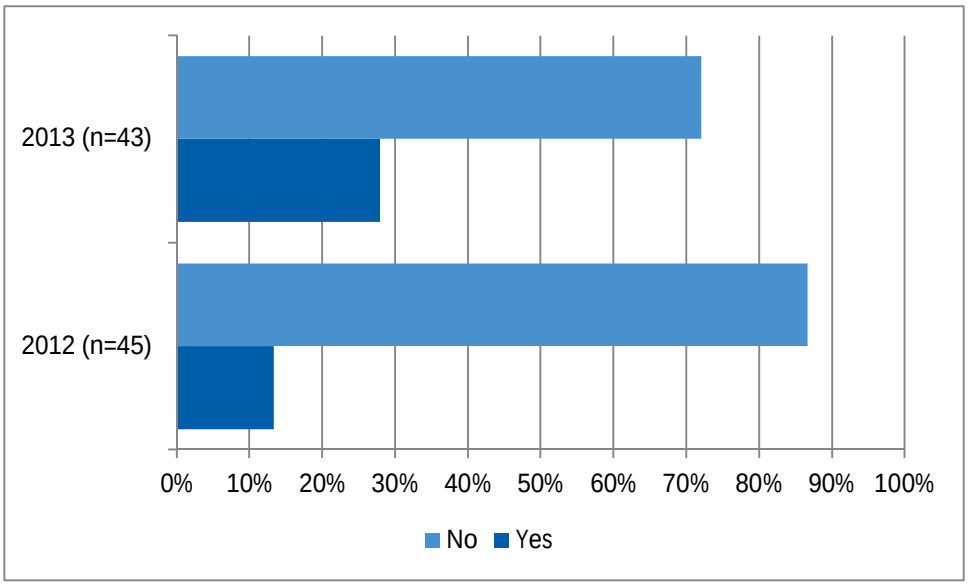
Customer Satisfaction

The frequency of program events may influence customer awareness of their participation and their levels of satisfaction.

Program staff reported that due to calling one more event in 2013 than 2012, plus two test events,[143] they expected overall customer satisfaction to moderately decline. According to staff, satisfaction is highest when customers do not notice any change in the comfort of their home. This theory may be supported by the differences between the 2012 and 2013 survey results: 14% of customers surveyed in October 2012 who were typically home between noon and 7:00 p.m. on weekdays could recall an event. In 2013, 28% of survey respondents who were typically home between noon and 7:00 p.m. on weekdays could recall an event (Figure 86).[144]

Figure 86. Proportion of Respondents Aware of Dispatch Event Occurring



QD3. Do you recall being aware of times when the compressor in your central AC or heat pump was cycled off? (n=43; don't know and refused answers were removed)

In addition, participant survey responses indicated lower levels of satisfaction in 2013, as program staff expected, with 67% of 2013 participants indicating they were very satisfied with the program (46 of 69), compared to 86% in 2012 (60 of 70; Figure 87).[145]

[143] Test events are dispatch events that only target participants in the program M&V sample.

[144] This result is statistically significant at the 90% confidence level (p=0.05).

[145] This result is significant at the 90% confidence level (p=0.01)

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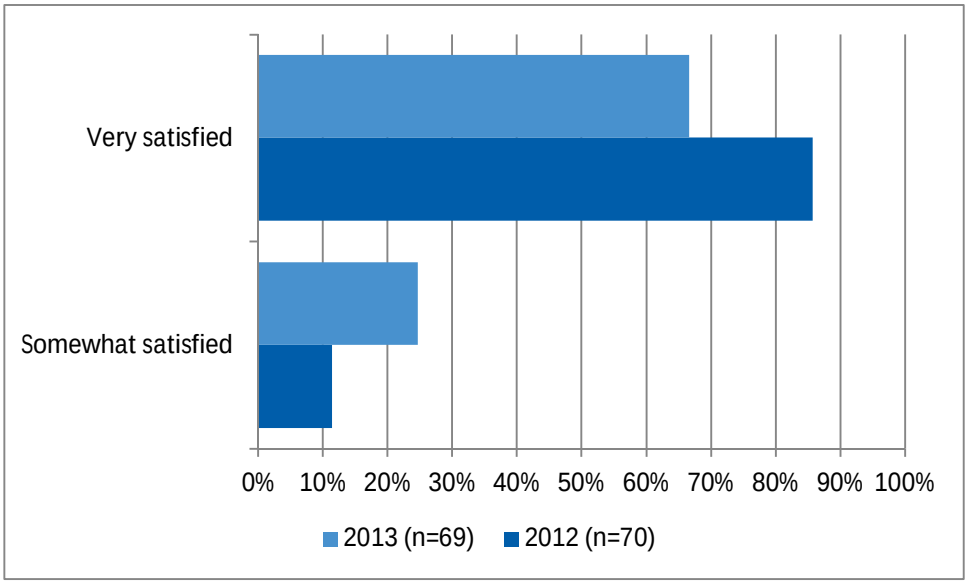
Figure 87. Overall Participant Satisfaction With Res DLC Program Experience



F6. Overall, how satisfied are you with the Summer Advantage Program? Would you say you are... (n=69; don't know and refused answers were removed)

However, we cannot clearly determine a direct link between the number of events and either the level of customer awareness or level of satisfaction. Therefore, we will monitor program results throughout the 2014 program cycle to assess whether there are more definable trends.

Customers are very satisfied with the professionalism of DCU installation and maintenance contractors.

Res DLC Program participants who were home when contractors installed a DCU on their HVAC system expressed high levels of satisfaction with the contractors' professionalism; 88% of 2013 participants surveyed indicated they were very satisfied (30 of 34; Figure 88). While this is a moderate increase compared to 2012, the difference is not statistically significant at the 90% confidence level. No 2012 or 2013 survey participants expressed any level of dissatisfaction with the professionalism of the installation contractor(s) who came to their home.

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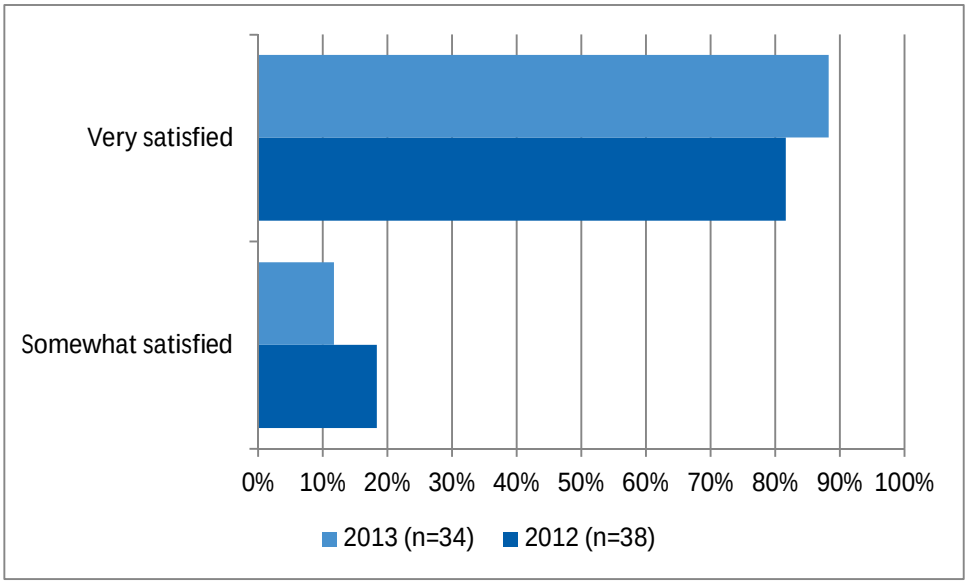
Figure 88. Customer Satisfaction With Installation Contractor Professionalism



QF2. How satisfied are you with the professionalism of the contractor or contractors that installed the DCU on your central AC or heat pump? Would you say you are... (n=34, don't know and refused answers were removed))

Program Materials

The website content developed for 2013 helped visitors understand what to expect from the program. Lack of customer education and awareness of program opportunities can be significant barriers in recruiting new participants and in maintaining satisfaction among existing participants.[146] To address these common challenges and recommendations from the 2012 evaluation, EAI redesigned the program page on the EAI website[147] and implemented a suite of new online educational content and interactive elements to introduce interested customers to the program on the Summer Advantage website.[148]

These website changes improved the user interface and are more visually compelling and more informative than the online resources available to customers in 2012. Notable improvements to the content were a step-by-step visual explanation of what occurs during dispatch events (Figure 89), and a questionnaire to help customers identify which cycling option is best for them (Figure 90).

Following 2012 recommendations, both websites now also emphasize the minimal impact participation will likely have on home comfort, and the EAI website mentions the high levels of customer satisfaction typically reported for residential direct load control programs.

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146 Federal Energy Regulatory Commission. *A National Assessment of Demand Response Potential*. Page 199. Available online: http://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf.

147 http://www.entergy-arkansas.com/your_home/save_money/EE/summer-advantage.aspx

148 https://www.eaisummeradvantage.com/

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Figure 89. Participation Tutorial From Summer Advantage Website

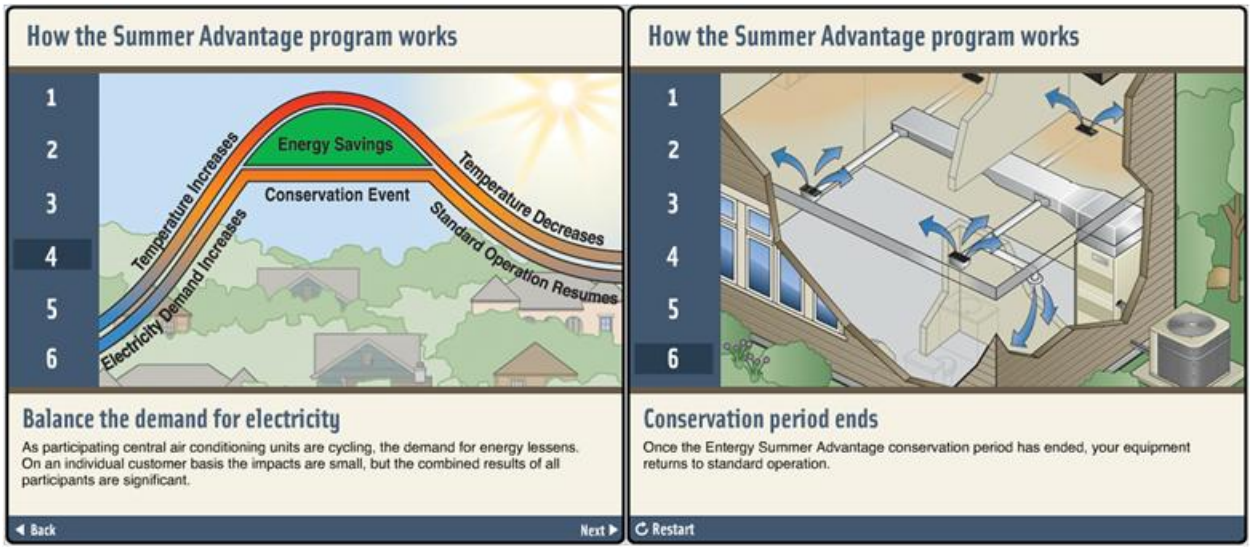
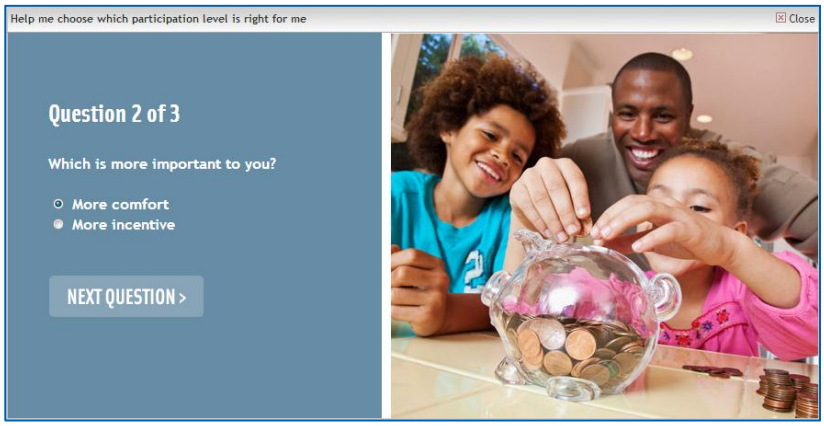


Figure 90. Cycling-Option Survey from Summer Advantage Website



Evaluation Recommendations

Recommendations for the Res DLC Program are included below.

Review the efficacy of the two-tiered incentive structure to determine if each tier's contribution to savings is proportionally aligned with program design intentions.

Contrary to expectations, the Evaluation Team found that savings impacts from the 50% and 75% cycling groups were nearly identical. Consider reviewing and confirming the functionality of the algorithm used by the DCUs to reduce the run time of the HVAC system compressor for both cycling options. Also, consider assessing the demand patterns of both cycling groups which may or may not affect the efficacy of the cycling algorithm.

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Agriculture Irrigation Load Control Program

Through the AILC Program, EAI provides incentives to eligible agricultural water pumping customers for allowing service interruption to participating wells. Customers on the Agricultural Water Pumping Service Schedule can receive bill credits of $4.16 per kW per month, up to 30% of the base electricity charge, for allowing EAI to interrupt service for up to three hours on weekdays from June 1 through August 30.

EAI notifies customers of events in real time via text message, telephone, or email, and provides notification when events end so customers can verify that well operations have returned to normal. There is no limit on the number of events EAI can call during the curtailment season. EAI staff implements the program with support from several third parties including: Accenture, Advanced Information Services, ATKINS, Elster Solutions, and SAIC.

EAI does not claim energy savings from the AILC Program.

Program Status Overview

The 2013 program achieved net evaluated demand reductions of 8.22 MW, surpassing EAI's demand reduction goal of 7.99 MW by 0.23 MW, or 3%, while also underspending its planned budget by 32%. However, the program fell significantly short of 2013 participation goals. EAI had hoped to enroll 400[149] customer accounts in 2013, but enrolled just 198, achieving 50% of the planned participation. This discrepancy between participation and demand reductions achievement indicates that EAI achieved significantly greater savings per participant than anticipated (Table 206).

Table 206. AILC Program Goals and Achieved Demand Reductions

	Goal	Actual	Percent of Goal Achieved
Demand Savings (MW)*	7.985	8.219	103%
Participation (accounts)	400	198	50%
Budget	$4,130,531	$2,779,216	67%

*MW actual represents evaluated net savings and reflect the application of a 1.0849 line loss factor.

Program staff reported that abnormally heavy rainfall and cooler weather pushed the planting season into late spring, which may have contributed to lower than expected program uptake. This, they said, caused a misalignment with the marketing and enrollment effort in February. Additionally, program staff reported that extended cold weather caused some farmers to miss the application deadlines for crop insurance. Without crop insurance, farmers could not plant and thus could not participate in the program. Nevertheless, the AILC Program surpassed its 2013 demand reduction goals.

[149] Although EAI's Energy Efficiency and Conservation Plan goals call for 2,200 participants in 2013, the Evaluation Team assumed those were cumulative goals. By subtracting the 2012 from the 2013 goals, we arrived at a goal of 400 new accounts for 2013. This figure was confirmed in program staff interviews.

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EAI originally launched the AILC Program as a pilot in 2008, and operations remained relatively unchanged through 2012. In 2013, EAI made two significant program changes.

5. First, EAI began providing all customers[150] with control over the AILC meter installed on their wells through an online interface, which allows program participants to turn the pumping equipment on participating wells on and off remotely. Without this interface, most agricultural businesses must activate their wells manually, an often time-consuming process because wells can be spread across fields and are often in difficult-to-reach locations. The web interface significantly reduces the time required to turn wells on and off.
6. Second, EAI began an aggressive marketing and enrollment effort in February 2013, earlier than in previous years. EAI anticipated that agricultural business decision makers would have more time—and be more receptive to program marketing—if they were contacted before crop planting. This effort, in combination with the full launch of the web interface pilot in 2012, was intended to provide EAI with an effective set of tools for recruiting program participants.

In 2013, EAI called five events, which took place on July 10, July 17, August 7, August 28, and August 30. EAI enrolled 275 new meters between the last curtailment in 2012 on August 28 and the last curtailment in 2013 on August 30, bringing the total number of meters enrolled to 1,438. During the 2013 curtailment season, 995 distinct meters participated in at least one curtailment.

Status of 2012 Evaluation Recommendations

Table 207 lists the status of each AILC recommendation reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed nearly all of the 2012 AILC recommendations during the 2013 program year.

Table 207. 2013 Status of 2012 AILC Program Recommendations

2012 Recommendation	2013 Status
Revisit planned 2013 goals to determine whether they are realistic in light of last year's shortfall.	*Completed.* Program staff revisited goals and determined that 2012 shortcomings resulted from atypically dry weather conditions, and therefore did not change 2013 goals.
If EAI maintains the current 2013 goals, market the program aggressively to increase participation. Monitor the program uptake and increase marketing activities as appropriate.	*Completed.* Program staff developed and implemented a marketing effort before planting season.
Develop case studies that feature program participants who may also have been concerned about some of the barriers nonparticipants mentioned. Use participant	*In Progress/Partial.* Program staff developed and included farmer testimonials in radio spots and print literature. However, staff did not develop case studies

[150] EAI tested the online interface with a limited number of customers in 2012. Only wells on which metering equipment was installed in 2011 or later are compatible with the web interface. Program staff estimated the proportion of customers with compatible metering equipment as just over half. The web interface does not allow the end user to control meters during curtailment events.

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2012 Recommendation	2013 Status
testimonials in program marketing, focusing on how the program has not had a negative impact on crop production, even for those crops that require water on a regular schedule or almost continuously.	to support marketing.
Consider increasing the use of bill inserts, phone calls, and email marketing channels to increase awareness of EAI program offerings among participant and nonparticipant agricultural business representatives. Emails could link to a brief survey to gauge customer interest and also investigate potential barriers to participation.	*Completed.* Staff sent three rounds of bill inserts to eligible customers. EAI customer service managers and a contracted third party made marketing calls to customers. EAI also implemented an online program search engine and banner ads.
Develop opportunities to cross promote EAI's other energy-efficiency programs to AILC participants.	*Completed.* Staff presented other EAI energy-efficiency programs at all participant outreach events.
EAI should use messaging that highlights program opportunities and tailor the marketing materials to the agribusinesses' needs.	*Completed.* Staff refined the program marketing message to promote the remote control tool for participating wells as a way to help farmers manage their time and money.
Train equipment installation contractors to promote EAI's programs while on-site with participating customers. Provide them with marketing materials they can hand to customers or leave at customers' sites.	*Completed.* Staff worked with servicemen (rather than installation contractors) who work closely with the farmers to promote other EAI energy-efficiency programs.
Evaluate offering a limited-time installation incentive for customers who sign up for the program early.	*In Progress/Partial.* EAI is considering the feasibility and benefit of adjusting incentives and/or event timing to attract new participants. This change would require filing a new program tariff, conducting a B/C analyses, and gathering testimony, and would need to be integrated into EAI's billing departments.
Consider adjusting the frequency and duration of curtailment events or offering tiered incentives that provide different levels of curtailment frequency and give participants the ability to select an option that is most appropriate for their business.	
Inform customers of the potential for delays between signing up for the program and having metering equipment installed to reduce the possibility for confusion.	*Completed.* Staff informed customers when they enrolled in the program that delays were possible. In addition, program staff trained EAI irrigation desk staff to inform customers of program benefits and processes.
Ensure that program roles and responsibilities are clearly defined in the program manual and well understood by all participants.	*Completed.* Staff updated the program manual and conducted a technical conference with all program actors in mid-summer to review program processes.
Develop communication and decision-making protocols, including documentation and tracking procedures and timelines for important issues (e.g., legal items, program changes, budgets and staffing).	*Completed.* Staff developed communication protocols, which were articulated in the 2013 program manual.
Regularly review program tracking data to confirm that program staff are sending out notifications accurately.	*Completed.* Staff reviews program notifications weekly.
Annually request that program participants confirm or update their contact information and provide their	*Completed.* Staff annually request that participants confirm or update their contract information.

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2012 Recommendation	2013 Status
preferred contact method for notifications.	
Review program materials to ensure that they clearly articulate the program process so that customers are well informed about what they can expect from participation.	*Completed.* Staff reviewed program materials, and also developed a program marketing plan.
For those customers who have do not have the web-enabled switches, consider replacing the old switches over time so that the curtailment events will have less impact on their pumping.	*Completed.* Staff approved switch replacement as part of standard meter maintenance.
Review program collateral and customer contracts to ensure that they clearly identify program contacts and provide information on the procedures participants' should follow to request assistance if installation issues arise.	*Completed.* Staff updated all outreach, literature, and advertising to direct customers to the website and irrigation desk telephone number.

Analysis Methodology

For the AILC Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[151]

- Data Collection Interview
  - Utility Program Manager (n=1)
- Year End Interview
  - Utility Program Manager (n=1)
- Participant Surveys (n=50)[152]
- Nonparticipant Surveys (n=76)[153]
- Materials Review
- Baseline Estimation
- Impacts Analysis

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

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151 The Evaluation Team conducted a full process evaluation of the AILC Program.

152 The program target was 70 completed surveys. In 2013, the Evaluation Team targeted only AILC participants who we had not contacted for the 2012 program evaluation. This decision led to a limited number of unique contacts (167), and as a result we were unable to achieve the target number of completes.

153 The program target was 70 completed surveys. The Evaluation Team completed six additional surveys because multiple interviewers conducted surveys simultaneously.

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Impact Summary

The Evaluation Team conducted an impact analysis of the AILC Program, which consisted of calculating a baseline demand and a gross demand reduction for each participating well. EAI provided the data for our analysis in 15-minute increments for all participating wells.

The AILC Program surpassed its demand reduction goal of 7.99 MW by 3%, based on net evaluated savings. The evaluated program impact is the average demand reduction across all events. The reduction achieved during each event is the sum of the reduction across participants in that event. The program goal and achieved demand reduction are shown in Table 208. *The net evaluated demand reduction includes an 8.49% adjustment to account for line loss.*

Table 208. AILC Program Demand Reduction Goal and Evaluated Net Demand Reduction

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction (MW)*	Percent of Demand Goal Achieved
7.99	8.22	103%

* The evaluated net demand reduction reflects the application of a 1.0849 line loss factor.

Methodology

EAI estimated the interrupted load, or *baseline*, as the registered load 30 minutes before the interruption. When calling an event, it takes EAI between two and 10 minutes to process, receive, and send commands to all the participating wells. This prevents EAI from using 15-minute readings just prior to the curtailment event to estimate the interrupted load. Therefore, to calculate the curtailed load for each event, EAI subtracts the average registered load during each hour of the event, summed across all meters, from the registered load 30 minutes prior to the event, also summed across all meters. EAI's reported demand reduction is the maximum achieved curtailed load on any given event day during the curtailment season.

To estimate the evaluated gross demand reduction, the Evaluation Team compared the average load during each event hour for each meter to the average load for that meter during the hour-long period ending 30 minutes prior to the start of the event. Then, we determined average hourly savings as the average savings across all participating meters. To calculate hourly demand reduction, the Team multiplied the average hourly savings by the number of meters that successfully disconnected. The average reduction for the curtailment season was the average curtailed load across all event hours.

By setting the baseline as the average across one hour instead of using the registered load at 30 minutes prior to the event, the evaluated baseline calculation more accurately reflects program savings because it reduces the effect of short-term load fluctuations that might occur prior to an event. For example, some growers might adjust their irrigation use shortly before the event in anticipation of the interruption. If growers were to curtail their irrigation at 30 minutes prior to the event, EAI's baseline estimate would understate the program impact. Conversely, the registered load estimate may overstate

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the impact if demand at 30 minutes prior to the curtail event was higher than normal, possibly because growers anticipated an event and increased their irrigation.

Evaluated Gross Savings

In 2013, EAI called five events, one each on July 10, July 17, August 7, August 28, and August 30, after calling three test events. Table 209 shows the date and type of all events. For the purposes of this evaluation, we excluded test events from the analysis.

Table 209. 2013 Curtailment Season Events

Date	Type
June 3, 2013	Test Event
June 13, 2013	Test Event
June 20, 2013	Test Event
July 10, 2013	Event 1
July 17, 2013	Event 2
August 7, 2013	Event 3
August 28, 2013	Event 4
August 30, 2013	Event 5

Table 210 shows the evaluated gross hourly average demand reduction results. These savings are estimated at the point-of-use, and thus *do not include line losses*.

Table 210. Evaluated Gross Hourly Average Demand Reduction Results

Date	Event	Hour	Average Savings Per Participant (kW)	Participating Wells	Evaluated Gross Demand Reduction (kW)
July 10, 2013	Event 1	2:00 p.m.	14.61	702	10,257
		3:00 p.m.	14.86		10,434
		4:00 p.m.	14.86		10,429
July 17, 2013	Event 2	5:20 p.m.	13.21	729	10,737
		6:20 p.m.	14.75		9,560
August 7, 2013	Event 3	3:00 p.m.	6.58	741	4,875
		4:00 p.m.	6.75		5,005
		5:00 p.m.	6.77		5,017
August 28, 2013	Event 4	3:00 p.m.	8.29	784	6,499
		4:00 p.m.	8.54		6,693
		5:00 p.m.	8.48		6,648
August 30, 2013	Event 5	2:00 p.m.	8.37	787	6,588
		3:00 p.m.	8.47		6,664
		4:00 p.m.	8.46		6,659
				Average kW Savings	7,576

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Table 211 shows the total reported gross and evaluated gross demand reduction per event. EAI determined a maximum reduction, highlighted in blue, of 11,470 kW, which took place on July 17, 2013 from 5:20 p.m. to 7:20 p.m. As shown, the realization rates for each event ranged from 88% to 95%.

Table 211. Comparison of *Reported Gross* and *Evaluated Gross* Reduction Estimates, by Event

Event	Start Time	End Time	Estimated Reduction (kW)		Realization Rates
			Reported	Evaluated	
July, 10, 2013	2:00 p.m.	5:00 p.m.	11,345	10,373	91%
July 17, 2013	5:20 p.m.	7:20 p.m.	11,470	10,148	88%
August 7, 2013	3:00 p.m.	6:00 p.m.	5,634	4,966	88%
August 28, 2013	3:00 p.m.	6:00 p.m.	6,929	6,613	95%
August 30, 2013	2:00 p.m.	5:00 p.m.	7,055	6,637	94%

Some of the differences between the EAI and Evaluation Team estimates can be attributed to different estimates of participation by event. Participation in an event is defined as the number of meters that are registered as having disconnected properly minus the meters belonging to customers who opted out. Participation can vary by event depending on the integrity of the meters and their ability to disconnect, which can sometimes be compromised by equipment malfunction or equipment tampering. This is discussed further below.

The Team found discrepancies between the list of meters that did not disconnect, provided by EAI, and the interval data: some listed meters did not report data for any time period in the interval data and others did not report data for the event time period. This discrepancy led the Team to estimate a lower number of meters that did not disconnect than that provided by EAI; thus, the Team estimated a larger number of participating meters than EAI. The Evaluation Team found similar discrepancies with the list of opt-outs provided by EAI, which also contributed to the Team's greater estimation of participants.

EAI reported that they are still determining successful disconnect and re-connect logic. Table 212 compares the EAI and Evaluation Team estimates of participating meters by event.

Table 212. Comparison of Participants, by Event

Event	Start Time	End Time	Disconnected Meters	
			EAI	Evaluation Team
July, 10, 2013	2:00 p.m.	5:00 p.m.	680	702
July 17, 2013	5:20 p.m.	7:20 p.m.	708	729
August 7, 2013	3:00 p.m.	6:00 p.m.	709	741
August 28, 2013	3:00 p.m.	6:00 p.m.	753	784
August 30, 2013	2:00 p.m.	5:00 p.m.	757	787

Table 213 compares the average baseline per participant using the registered load 30 minutes prior to the event (used for reported gross) and the average over the hour 30 minutes prior to the event (used for evaluated gross). In general, the baseline estimates were very similar. The Evaluation Team found no

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clear pattern in the relationship between the two values: the baseline estimate used for reported gross savings was sometimes lower than and sometimes higher than the baseline used for evaluated gross estimates.

Table 213. AILC Comparison Baselines

Event	30 Minutes Prior Approach (Used for Reported)	Difference	Average of One Hour, 30 Minutes Prior Approach (Used for Evaluated)	% Difference
July, 10, 2013	17.03	>	17.02	0.09%
July 17, 2013	16.73	>	16.66	0.40%
August 7, 2013	7.89	<	7.91	0.30%
August 28, 2013	9.37	<	9.38	0.03%
August 30, 2013	9.32	<	9.38	0.68%

A weakness of using the registered load 30 minutes prior to the event as the baseline is that, because it is instantaneous, it does not reflect possible demand fluctuations over time. We determined that demand did fluctuate over the hour ending 30 minutes prior to the event. Figure 91 shows the demand from 12 selected meters during the hour 30 minutes prior to the fifth event on August 30, 2013. The difference in each participant's average demand over the full hour illustrates the variation. Some meters show very little variation in demand over time, while other meters show clear changes. While the differences are small (less than 0.10 kW), they suggest that using the average over the hour, rather than the registered load, smooths short-term fluctuations and produces a more representative baseline estimation.

Figure 91. Load From Selected Meters Prior to August 30, 2013 Event

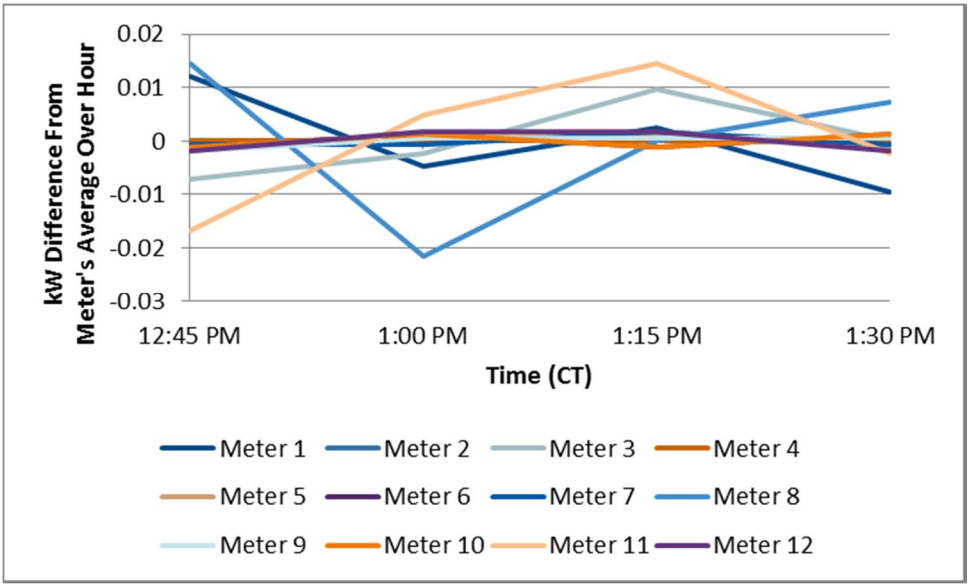

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Table 214 shows the *ex post* program savings as an average of the demand savings for each event. The average program savings is 7.6 MW. These savings are estimated at the point-of-use and thus *do not include line losses*.

Table 214. AILC Program *Ex Ante* and *Ex Post* Gross Demand Reduction

Program	*Ex Ante* Demand Reduction (MW)	*Ex Post* Demand Reduction (MW)	Realization Rate
AILC	N/A	7.6	N/A

Table 215 presents the difference between the EAI and Evaluation Team estimates of demand reduction and quantifies the two main driving forces. We attribute the majority of the differences to EAI using the maximum avoided load and the Evaluation Team using the average kW reduction across all events.

Table 215. Breakdown of Differences Between Reported Gross and Evaluated Gross Demand Reduction

	Demand Reduction (kW)	
EAI's Maximum Reduction	11,470	
Evaluation Team's Average Reduction	7,576	
Total Difference	3,894	Percent Attributable
Difference due to EAI using the maximum avoided load and the Evaluation Team using the average kW reduction across all events	3,197	82%
Difference due to EAI using the registered load 30 minutes prior to the event as the baseline and the Evaluation Team using the average across one hour	430	11%
Difference due to variation between the EAI and Evaluation Team estimates of participation	267	7%

Evaluated Net Savings

The Evaluation Team assigned a NTG ratio of 1.0 to the AILC Program because there is no plausible mechanism by which program effects, such as the timing of demand reduction in response to total system demand, would be achieved without program intervention.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

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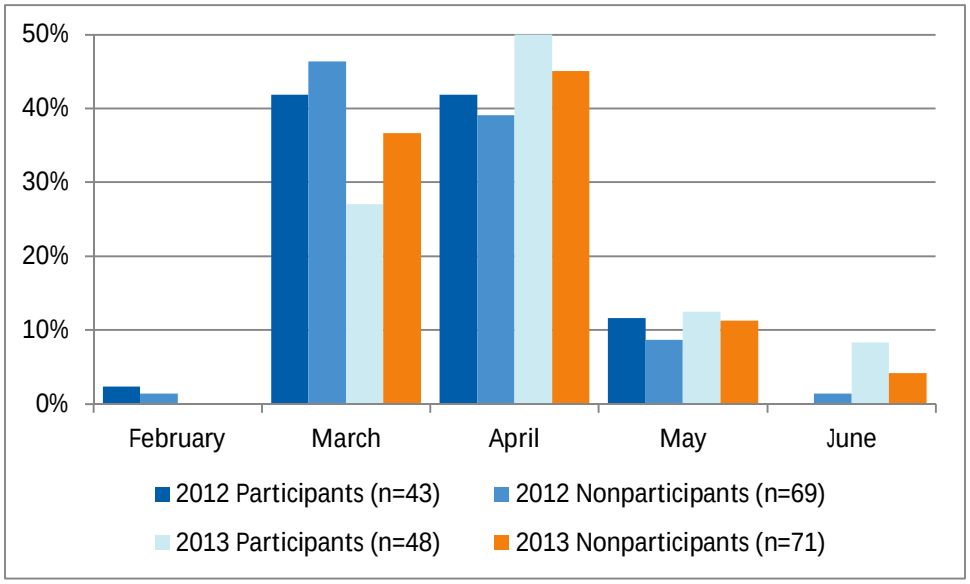
Program Performance

Abnormal weather conditions may have impacted EAI's ability to achieve participation goals.

Staff had hoped to enroll 400 customer wells in 2013, but achieved just under half of the goal.[154] Program staff reported that a key challenge to program engagement in 2013 was abnormally heavy rainfall, which pushed the planting season for many potential participants into late spring. This observation is supported by responses to participant and nonparticipant customer surveys implemented in 2012 and 2013. In 2012, most participating and nonparticipating customers reported completing their first round of planting by the end of May. However, in 2013, equivalent levels of planting were not reported until June (Figure 92).

Figure 92. First Planting Reported by 2013 Participants and Nonparticipants for the 2012 and 2013 Planting Seasons (February – June)



Source: Multiple survey questions. See Appendix A.

Delays in planting resulted in a misalignment with the marketing and enrollment effort implemented in early 2013. Additionally, program staff reported that the inclement weather caused some farmers to miss the application deadlines for crop insurance, and without crop insurance farmers could not plant fields and therefore could not participate in the program.

Program Design

The expanding well enrollment by current participants offers an opportunity to improve performance.

Program staff reported one ongoing challenge in program recruitment was encouraging existing participants to enroll all of their electric wells. Often new program participants will enroll a few wells to try the program out, but neglect to later enroll their remaining eligible wells. Surveys with participating

[154] This 198 is the number of accounts enrolled in the program in 2013 based on review of program tracking data provided by AILC staff October 11, 2013.

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customers confirm this finding; approximately 30% of participants surveyed in 2012 and 2013 reported they enrolled all of their electric wells in the program (Table 216).

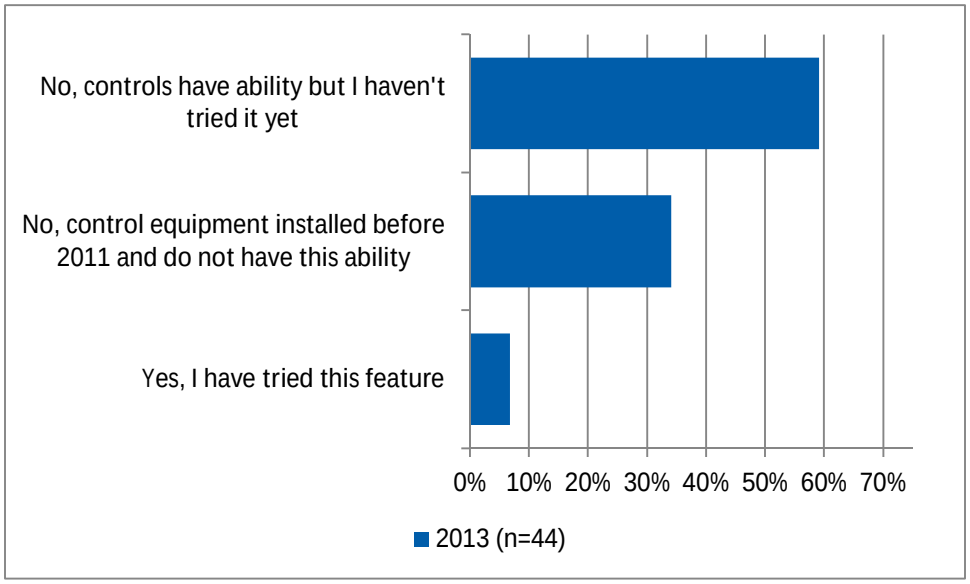
Table 216. Characteristics of Participant Wells

	2012 (n=59)	2013 (n=37)
Average number of electric wells per participant	15	11
Percent of respondents will *all* electric wells participating	29%	30%

Participants have not yet fully embraced the online well control interface.

In 2013, EAI fully implemented an online tool that allows participating customers to turn their wells on and off remotely. The online interface was a central component of in-person program outreach activities conducted in 2013. However, as indicated in Figure 93, very few participating customers surveyed in 2013 reported using this new feature (7%, or three of 44).

Figure 93. Participant Use of Remote Pumping Equipment Control



Multiple questions asked, see Appendix A.

Despite low reported use of the online interface, more than half of participating (61%, or 27 of 44) and nonparticipating (51%, or 38 of 75) customers expressed interest in learning more about the feature (Figure 94). These findings are consistent with feedback from program staff, who indicated that agriculture customers tend to be slow to change their business practices and late to adopt new technologies.

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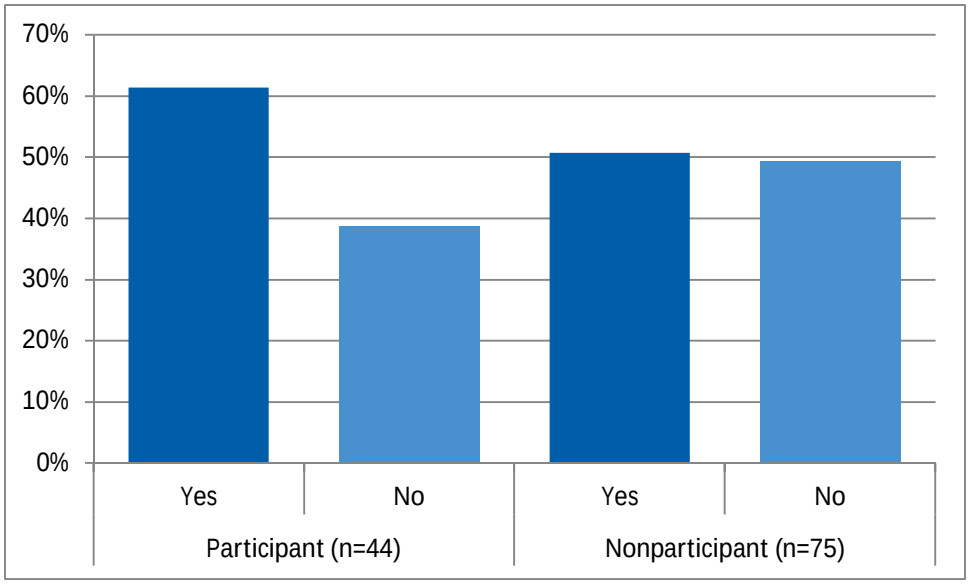
Figure 94. Customer Interest in Remote Water Pumping Equipment Control



Multiple questions asked, see Appendix A.

Marketing and Outreach

Atypical weather limited the effectiveness of an otherwise robust and well-executed marketing effort.

Based on experiences in 2012, program stakeholders recognized that timing is critical for effective program marketing. To be most effective, staff concluded that program marketing needed to begin before the planting season, when agriculture customers have more time and would be more receptive to program outreach. With this in mind, staff executed the marketing campaign during the first quarter of 2013.

The 2013 marketing campaign was similar in design to the 2012 campaign. However, as recommended in the 2012 evaluation, EAI expanded the use of bill inserts and direct mail, and added paid mass media. In further accordance with the 2012 recommendations, the program staff developed marketing pieces that featured testimonials from participants and cross-promoted the AILC Program with other EAI energy-efficiency program at agriculture events. Despite the dispersed nature of agriculture customers, AILC outreach activities effectively reached potential AILC participants and encouraged participation across the service territory.[155]

Although the marketing strategy was sound, an atypically rainy spring delayed planting for many famers, created uncertainty about which fields and equipment they would use, and muted messaging around conserving water use.

[155] The Evaluation Team based the geographic distribution of program participants on a review of the program tracking data provided by AILC staff on October 11, 2013.

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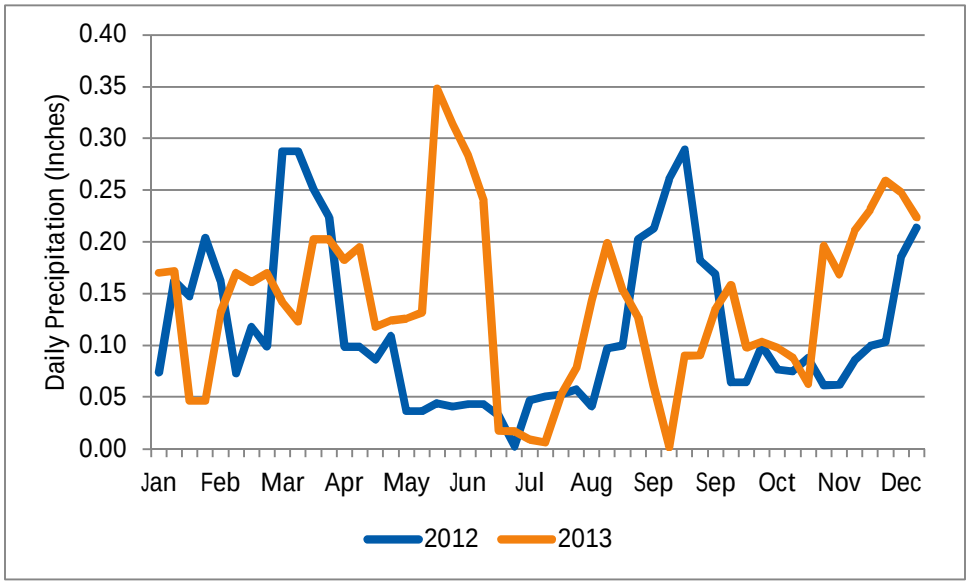
The service area experienced similarly disruptive weather conditions in 2012, when a severe drought impacted farmers' willingness to curtail their irrigation pumps. Thus, 2013 was the second year in which weather conditions contributed to the program not achieving its goals. Figure 95 displays the monthly rainfall rates in 2012 and 2013.

Figure 95. Four-Week Sliding Average of Daily Precipitation (inches) in 2012 and 2013



Source: National Climate Data Center, NOAA. Summary of precipitation, January 1, 2012 through December 31, 2013. Little Rock Airport Adams Field, Arkansas U.S. weather station.

Awareness of EAI's energy-efficiency and demand reduction programs is increasing.

Both participating and nonparticipating customers reported appreciably higher levels of awareness of EAI program offerings in 2013 compared to 2012, including AILC. Specifically, 20% of 2013 participant respondents (10 of 50) reported awareness of at least one EAI energy-efficiency program (other than AILC) compared to just 9% in 2012 (six of 69). Twenty-one percent of 2013 nonparticipant respondents (16 of 75) reported awareness of at least one EAI energy-efficiency program (other than AILC) compared to just 8% in 2012 (five of 66; Figure 96).[156] Nonparticipating customers are also increasingly aware of the AILC Program: 87% of customers surveyed in 2013 (66 of 76) compared to 79% surveyed in 2012 (49 of 62).[157]

[156] Both increases are significant at the 90% confidence level (p=0.05 and 0.01, respectively).

[157] This result is not significant at the 90% confidence level.

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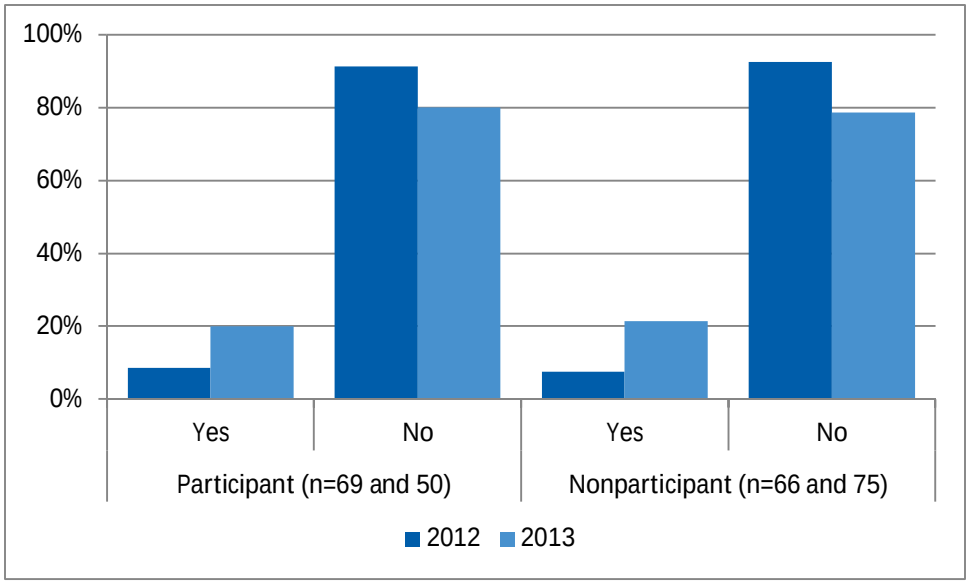
Figure 96. Customers Aware of EAI Energy-Efficiency Programs Other Than AILC



Multiple questions asked, see Appendix A.

Program Delivery and Implementation

Periodic program process reviews ensured a high quality program.

In 2011, the program began using an electronic system to assign work orders to equipment installation crews. However, during a program process review in June 2013, staff discovered that if a meter installation had not been completed—because of weather, scheduling constraints, or other issues—the work was never reassigned. This reassignment gap meant that approximately 130 wells were waiting for meter installation without being listed in the program tracking system. Once identified, staff quickly addressed the missing work assignments, and by September 2013 field staff had completed the outstanding meter installation backlog.

Administrative Processes

Constant communication assessments and refinements supported smooth implementation.

As noted in the 2012 program evaluation, the program has a higher-than-average potential for communication issues because it is supported by five different subcontractors. To reduce communication issue risk, programs staff updated the communication protocols in the 2013 program manual. EAI also held a two-day seminar in June 2013 for all program stakeholders, including Evaluation Team staff. The seminar was designed to review program processes, activities, and roles, and to confirm all stakeholders' readiness for the 2013 curtailment season.

Customer Satisfaction

Participants remain satisfied with the program and with EAI as an electric service provider.

Participating customers surveyed in 2012 and 2013 indicated high levels of satisfaction with a number of program elements (indicate by saying they are "somewhat satisfied" or "very satisfied"; Figure 97).

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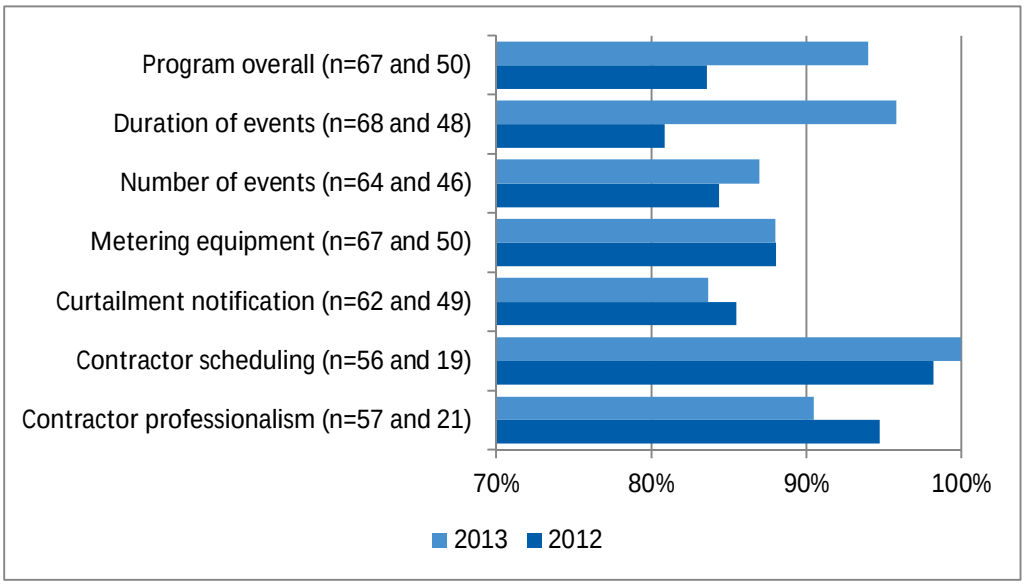
However, more 2013 participants reported satisfaction with the curtailment event duration (96% compared to 81% in 2012),[158] as well as with the AILC Program overall (94% compared to 84% in 2012).[159]

Figure 97. Participant Satisfaction With Program Elements, 2012-2013



Multiple questions asked, see Appendix A.

Approximately one-third of surveyed 2013 AILC participating customers (28%, or 14 of 50) reported that their opinion of EAI increased because of their AILC Program participation. This result represents a substantial increase from 2012, when only 13% of participants (nine of 68) indicated that their AILC participation positively impacted their opinion of EAI.[160]

Farmers were frustrated by a lack of fully understanding how AILC meters operate.

Starting in 1998, EAI required farmers to install a switch that would manually disconnect power from the EAI transformer to the well so farmers could perform pumping equipment maintenance more safely. AILC meters have rechargeable batteries that will only cover short power interruptions, so EAI modified its policies in 2007 to formally discourage customer use of the manual disconnect switches. However, many farmers continue to use them. When customers disconnect power to their wells for more than a few days, the AILC meter turns off, requiring an in-person service call to restore function.

According to program staff, farmers' ongoing use of these switches was the most common reason for service calls in 2012 and 2013. Approximately 40% of participating customers surveyed in 2013 (20 of

[158] This result is significant at the 90% confidence level (p=0.02).

[159] This result is significant at the 90% confidence level (p=0.07).

[160] This result is significant at the 90% confidence level (p=0.03).

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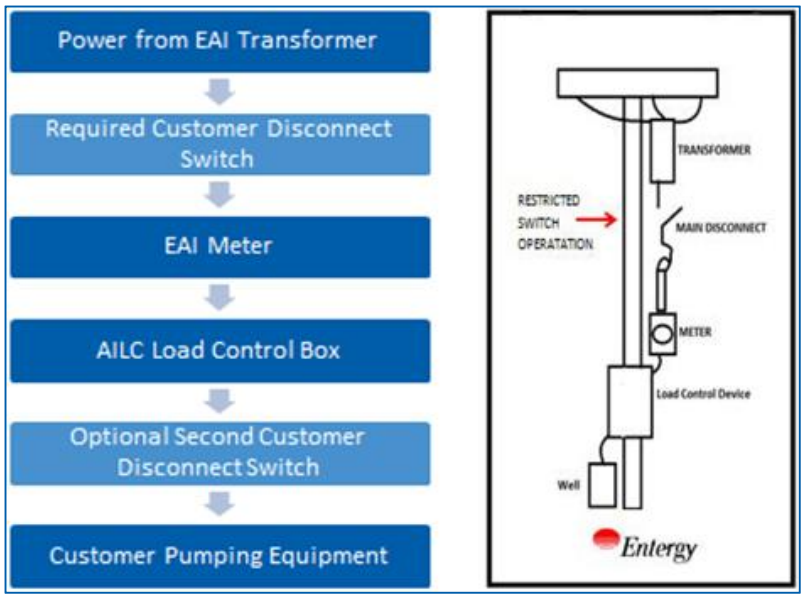
49) and 35% of participating customers surveyed in 2012 (24 of 69) reported having issues with their pumping equipment because of the AILC metering equipment attached to it.

In 2013, program staff took steps to address this issue by instructing service technicians, when called out to reset meters due to power loss, to affix an informational tag to the switch. The tag clearly outlines why the meter turned off, and requests that famers stop using the switch to control power to the wells. The tag also encourages farmers who were interested in a way to disconnect power in case of lightning strike or other concerns to use the AILC meter through the online interface. Customers may also request installation of an additional control switch below the AILC meter. This second switch would not interfere with the meter, but would allow the customer to disconnect power to the well. This configuration and a sample of the AILC disconnect tag are provided in Figure 98.

Figure 98. AILC Participant Electrical Equipment and AILC Disconnect Switch Tag



Data Tracking

Discrepancies in the tracking data led to a higher participation estimate than EAI assumed.

Participation in the AILC Program is defined as the number of meters that registered as having disconnected properly during an event, minus the meters belonging to customers who opted out. The Team found discrepancies between the list of meters that did not disconnect provided by EAI and the interval data, mainly due to difficulties with identifying properly disconnected and re-connected meters during the curtailment events. Some listed meters did not report data for any time period in the interval data and others did not report data for the event time period. This discrepancy led the Evaluation Team to estimate fewer meters that did not disconnect than EAI, based on the list provided; thus, the Team estimated a larger number of participating meters than EAI. The Evaluation Team found similar discrepancies with the list of opt-outs provided by EAI, which also contributed to our estimating a greater number of participants.

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EAI reported that they are still determining successful disconnect and re-connect logic.

Evaluation Recommendations

The Evaluation Team did not identify any program-specific recommendations for the AILC Program in 2013.

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Energy Solutions for Manufactured Homes Program

Through the Energy Solutions for Manufactured Homes Program, EAI provides cost-effective energy-efficiency measures to customers who live in manufactured homes. ICF implements the program by installing energy-efficiency measures in participating customers' residences at no cost to property owners or residents.

EAI also offers an on-site energy survey of the residence and applicable equipment through the program. Customers receive a summary report of the home's potential energy savings, as well as information about other EAI programs for which they may be eligible. Mobile home park owners also receive a report summarizing the entire property's potential savings that includes information about other EAI programs for which they may be eligible.

The measures available for direct installation in eligible homes are:

- CFLs in fixtures and lamps that replace incandescent bulbs
- 1.5 gpm showerheads
- 1.5 gpm faucet aerators

For the two water heating measures—showerheads and faucet aerators—EAI only claims energy and demand savings in properties with electric water heating.

Program Status Overview

The Manufactured Homes Program achieved 106% of its net energy-savings goal but met just 17% of its demand-reduction target. The program engaged 1,015 residences, meeting 56% of its 2013 participation goal of 1,819 residences. Table 217 summarizes these results.

Table 217. Manufactured Homes Program 2012 Participation and Net Savings Goals vs. Actual*

	Goal	Actual Evaluated Savings	Percent of Goal Achieved
Energy Savings (MWh)*	641	680	106%
Demand Savings (MW)*	0.50	0.09	17%
Participation (customers)	1,819	1,015	56%
Budget	$836,228	$857,328	103%

* These MWh and MW values represent evaluated net savings and reflect an adjustment for line losses of 8.49%.

Although the program achieved only 56% of its 2013 participation goal, participation was notably greater than in 2012 when the program treated only 840 residences. The program exceeded its energy savings target while underperforming on participation, which indicates that the program generated greater savings per installed measure than EAI assumed in its planning estimates.

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Staff reported two program changes in 2013 that helped contributed to its success:

- The implementer hired a fluent Spanish speaker to support the installation team. Implementation staff reported that having a fluent Spanish speaker on staff made it easier for Spanish-speaking residents to understand and participate in the program.
- Addressing a 2012 recommendation, the implementer expanded coverage to a much broader geographic area of the state.

Status of 2012 Evaluation Recommendations

Table 218 lists the status of each of the Manufactured Homes Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed all of the 2012 recommendations during the 2013 program year.

Table 218. 2013 Status of 2012 Manufactured Homes Program Recommendations

2012 Recommendation	2013 Status
Consider revising the program webpage to add visual elements, greater emphasis on a compelling messaging to motivate customer participation, and a clear call-to-action.	*Completed.* Program staff updated the website to provide an improved look and feel, easier navigation, and more program information.
Provide copies of all marketing materials for the Evaluation Team's review.	*Completed.* Implementation staff provided all marketing materials used in 2013.
Continue to extend program coverage throughout the service territory, particularly focusing on eastern and southern portions of the state, such as the areas in and around El Dorado, West Memphis, and along the I-40 corridor.	*Completed.* Implementation staff completed installs in five manufactured home parks in El Dorado and several in Lonoke, Conway, and Pope counties (along the I-40 corridor). Because the parks identified in West Memphis are not in EAI's territory, staff did not provided services there.
Simplify the summary report provided to participants to make it easier for laypeople to understand. Eliminate jargon, clearly identify graphic elements, and highlight the energy savings customers receive from the measures installed.	*Completed.* Implementation staff revised summary reports to simplify language and highlight energy savings from measures installed.
Provide the cross-promotion letter and the summary report in Spanish, where appropriate.	*Completed.* Implementation staff hired a fluent Spanish speaking staff member and set-up a call-in number to answer customer questions in Spanish or provide translation. In addition, staff included a sentence in Spanish in the mailed report directing customers to call with questions.
Consider having brochures or flyers available during site visits in case participants ask for more detail on EAI's programs.	*Completed.* Implementation staff developed a Manufactured Homes report that summarizes work done and mentions other EAI programs for which residents may be eligible. Installers carry other residential EAI program brochures and make in-person recommendations during site visits when appropriate.

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2012 Recommendation	2013 Status
Fine tune the flow chart to more specifically represent program activities.	*Completed.* Implementation staff added program-specific elements to the flow chart.
Collect all measure parameters necessary to calculate reported savings per the TRM 2.0 algorithms. While default values exist for water heater setpoints and weather zones can be determined from the premise ZIP code, ICF should add these measure parameters to its data collection form so that field staff can collect the information at the time of measure installation. In addition, while savings are not currently claimed for pipe wrap for cost-effectiveness reasons, there are no defaults for the missing parameters for this measure. Therefore, the information will not be available to claim savings under TRM 2.0 should this measure become cost-effective in the future.	*Completed (Considered/Rejected).* Program staff considered the recommendation, but decided not to implement as it was cost-prohibitive.
Consider conducting primary research to determine a NTG ratio for the 2013 program year.	*Completed.* The Evaluation Team included NTG research as part a multiprogram participant survey in 2013.

Analysis Methodology

For the Manufactured Homes Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[161]

- Year End Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Participant Surveys (n=32)
- Calculation of TRM-Based Savings
- Program Attribution Analysis (NTG)
- Database Review

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

[161] The Evaluation Team conducted a condensed process evaluation of the Manufactured Homes Program.

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Impacts Summary

The Evaluation Team conducted an impact analysis of the Manufactured Homes Program, which consisted of a database review and participant phone surveys to:

- Verify measure installation
- Calculate an installation persistence rate
- Estimate the NTG ratio for the program
- Calculate *ex post* verified gross savings, net energy savings, and demand reductions

Table 219 and Table 220 show the program's net annual goals for 2013, as well as the reported (*ex ante*) and evaluated (*ex post*) net annual energy savings and demand reduction. All energy and demand values include an 8.49% adjustment for transmission and distribution line losses. Goals and *ex ante* net savings reflect the application of an assumed program NTG ratio of 0.80. *Ex post* net savings reflect application of a program-calculated NTG ratio of 0.92.

Table 219. Manufactured Homes Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)*	Percent of Energy Goal Achieved
641	680	106%

* The evaluated net energy savings reflect the application of a 1.0849 line loss factor.

Table 220. Manufactured Homes Demand Reduction Results

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction (MW)*	Percent of Demand Goal Achieved
0.50	0.09	17%

* The evaluated demand reduction reflects the application of a 1.0849 line loss factor

Review of Program Tracking Data

The Evaluation Team conducted a desk review of the program tracking data to ensure savings were consistent with the Arkansas TRM 3.0 and claimed only where appropriate. . Additionally, the Team checked parameter values to verify that they were sufficient to calculate savings according to the algorithms in the TRM and were within reasonable ranges.

Review of Site Inspection Records

This program evaluation budget did not allow for the Evaluation Team to conduct post-installation verification site inspections; however, the program implementer conducted site inspections on a sample of 34 treated residences as part of their QA procedures. The Evaluation Team requested and reviewed all available QA data and compared the installed measures and quantities in the program tracking database to those in the site inspection records.

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The implementer provided the Evaluation Team with their site inspection data in PDF format. The Team created a database from the PDF documents in order to merge the site inspection data with the program tracking database, which we encountered several problems with. First, the PDF documents did not include a key value to tie the two data sources together, such as the program implementer's JobID, so the Team matched the site inspection data with the tracking data by customer name and address, successfully matching 31 of the 34 site inspection records. We further noted that the site inspection forms included the water heater fuel source reported by both the inspector and the resident. For three homes in the sample, the water heater fuel source recorded in the tracking data did not match the fuel source reported by either the inspector or the customer. Finally, only 19 of the 31 matching records included the date of the site inspection. Of these 19 records, five inspections occurred more than three months after the installation date; the remaining 14 homes had site inspections within one month of the installation date (four site inspections occurred on the same day as the measure installations).

The *Manufactured/Mobile Home Direct Install and Survey Program and Procedure Manual* states that the QA/QC audit of the residence will consist of:

1. "Confirming products in these units were installed correctly.
2. Confirming the number of products installed match with the number recorded.
3. Confirming materials were installed according to program standards (for example, bulbs installed in high usage areas).
4. Verifying no leaks in faucet aerators and showerheads."[162]

Although verifying installed measure quantities is a stated goal of the program implementer's QA site inspections, the program implementer noted that their focus of site inspections during 2013 was on points 1, 3, and 4. Because the Evaluation Team fielded a participant phone survey with questions designed for the express purpose of verifying installed measure quantities, we are able to report summary statistics from the program implementer's site visits for informational purposes only. The Team did not adjust energy savings and demand reductions using findings from the site visits, but used the findings from the Evaluation Team's phone survey for these adjustments instead.

Evaluated Gross Savings and TRM Review

The Evaluation Team reviewed the tracking database provided by the program implementer to determine if they collected the data necessary to calculate savings using the algorithms in the TRM 3.0. Table 221 summarizes the TRM parameters that were not collected in the 2013 tracking data, along with available default values.

[162] ICF International. *Manufactured/Mobile Home Direct Install and Survey Program and Procedure Manual.* page 10. Updated July 9, 2013.

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Table 221. Missing TRM 3.0 Parameters: Manufactured Homes

Measure	Missing Parameter	Default Value Available
CFLs	Wattage of Bulbs Removed	Table 135
	Heating Type	Table 138* – Use default value of 0.79 for unknown heating type
Aerators	Weather Zone	Map by ZIP code
Showerheads	Weather Zone	Map by ZIP code

The tracking database included fields for weather station and weather zone, plus four fields for heating system, but these fields were not populated.

The implementer calculated *ex ante* savings per measure installed in conformity with the algorithms in the TRM 3.0. The Team also calculated the *ex post* evaluated savings using the algorithms provided in the TRM 3.0.

Table 222 and Table 223 provide energy and demand savings by program measure. These savings are estimated at the point-of-use and thus do not include line losses.

Table 222. Manufactured Homes *Program Ex Ante* and *Ex Post* Gross Energy Savings

Measure	*Ex Ante* Energy Savings (MWh)	*Ex Post Verified* Energy Savings (MWh)	Realization Rate
CFLs	272	267	98%
Aerators	56	48	86%
Showerheads	375	364	97%
Total	703	678	96%

Table 223. Manufactured Homes Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction

Measure	*Ex Ante* Demand Reduction (kW)	*Ex Post* Verified Demand Reduction (kW)	Realization Rate
CFLs	48.8	42.9	88%
Aerators	5.8	5.0	86%
Showerheads	39.0	37.8	97%
Total	93.7	85.7	91%

CFLs

The Evaluation Team calculated energy savings and demand reductions in accordance with the algorithms in the Arkansas TRM 3.0 (Vol. 2, Sec. 2.5), which takes into account the impacts of EISA; these algorithms also incorporate parameters for a lamp ISR and IEFs to account for the decrease in the cooling load associated with replacing incandescent bulbs. TRM 3.0 adds a gas heating penalty interactive effect.

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The Team replaced some parameter values provided in the TRM 3.0 with values we calculated using data collected in our residential light logging study. This study is described in detail in the Residential Lighting and Appliances Program section. Table 224 presents the parameter assumptions used in TRM 3.0 compared to those we determined from the light logging study.

Table 224. Manufactured Homes Program Lighting Parameter Assumptions

Parameter	Description	Units	TRM Version 3.0	Light Logging Study
In-Service Rate	Percentage of rebated bulbs installed	Ratio	0.97	
Coincidence Factor	Summer peak coincidence factor	Ratio	0.09	0.1
Interactive Effect - Demand	Account for cooling demand savings	Ratio	1.53	1.25
Interactive Effect- Energy	Account for cooling energy savings and heating energy penalties	Ratio	0.43-1.14	0.97
Interactive Effect - Gas Heating Penalty	Account for gas heating penalties in homes with gas heating	Ratio	-0.023	-0.0063
Annual Hours of Use - Indoor	Average hours of use per year	Hours	803.6	792.6
Annual Hours of Use - Outdoor			1,132	

Where we did not obtain estimates from our light logging study, the Evaluation Team used the default values from the TRM 3.0.

In the TRM 3.0, the IEF_E ranged from 0.43 for homes heated with electric resistance heat to 1.14 for homes heated with gas. It specifies that the calculations for *ex ante* savings should use a heating system-specific IEF_E or, alternatively, a default value where "heat type cannot be determined." As the tracking data provided no information about the heating system, we used the default value in our savings calculations.

TRM 3.0 specifies an ISR of 0.97 for measures installed through a direct install program and the Team used this value in the *ex post* gross kWh savings calculations for CFLs.

The light logger study revealed indoor daily lamp use of 2.17 hours, or, on an annualized basis, 792.6 AOH. The Team used the evaluated annual indoor HOU in our savings calculations.

EISA regulations affected the baseline wattage of 23-watt and 18-watt CFLs in 2013. For 23-watt CFLs, all bulbs were installed during the post-EISA period (on or after July 1, 2012), so the Team calculated savings for all lamps using the post-EISA reduced baseline of 72 watts. For 18-watt CFLs, the Team calculated energy savings using a pre-EISA baseline of 75 watts for any bulb installed before July 1, 2013; for 18-watt bulbs installed on or after July 1, 2013, the Team calculated energy savings using a baseline of 53 watts. All 13-watt CFLs were installed in the pre-EISA period, as EISA regulations did not take effect for 60-watt and 40-watt incandescent bulbs until January 1, 2014. The Team assumed a baseline of 60 watts for 13-watt CFLs.

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In October 2013, the Evaluation Team fielded participant phone surveys and achieved responses from 32 Manufactured Homes Program participants. These data provide precision of 14.4% at the 90% confidence level. During the survey, we asked respondents to verify the number of bulbs installed during the program. Table 225 presents a summary of the survey findings for CFLs.

Table 225. Manufactured Homes Program CFL Verified Measure Quantity and Installation Persistence

Parameter	Count	Percent
Number of Respondents	32	
Tracking Data Bulb Quantity of 32 Respondents	217	
Verified Bulb Quantity*	213	98.2%
Verified Bulb Quantity Still Installed at Time of Survey**	208	97.7%
Final Verified Installation Rate	208/213	95.9%

* Multiple survey questions: C1 and C6; see Appendix A.

** Multiple survey questions: C10, C12, and C13; see Appendix A.

The Team also asked survey respondents to report the number of program bulbs still installed. If respondents reported that program bulbs were not still installed, we asked if they had replaced them, and if so, with what type of bulb. As Table 225 shows, 208 of the 213 verified installations were still installed at the time of the phone survey. A single respondent reported removing the remaining five bulbs, noting that they had burned out. The respondent reported replacing the failed CFLs with "the type of bulbs I had before," i.e., not CFLs. The Evaluation Team calculated a final verified installation rate of 95.9% from these responses and adjusted the gross kWh savings and gross demand reduction by this value.

The Evaluation Team analyzed the program implementer's verification site visit data to determine if the data could be used to calculate a comparison value for the verified lighting measure installation rate. Table 226 shows a comparison of the measure quantities recorded in the tracking data and the quantities reported by the site inspector; it shows that the site inspector reported 90% of the bulbs recorded in the tracking data. While the implementer's site visit value is consistent with the Team's phone survey results, we deferred to the Team's value for the reasons stated above.

Table 226. Manufactured Homes Program – CFL Site Inspection Quantities

Parameter	Tracking Data Quantity	Site Inspection Quantity	Installation Rate
CFL - 13 Watt	158	156	99%
CFL - 18 Watt	27	14	52%
CFL - 23 Watt	6	1	17%
All CFLs	191	171	90%

Some quantities recorded during site inspections were higher than the measure quantities recorded in the tracking database. Removing these excess bulbs from the analysis leads to an installation rate of 73%. For reasons discussed in the Review of Site Inspection Records section, we did not use the site inspection findings to adjust savings for CFLs.

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The realization rate for CFLs is driven by the verified installation rate of 90% and the differences between the TRM 3.0 algorithm parameters and the evaluated parameter values determined through the light logging study. The Evaluation Team used the weighted average value for all the IEF_e calculations, and consequently there is one per unit kWh savings value for each bulb type, location, and EISA period. For bulbs installed indoors, the *ex ante* calculations produced a range of per-unit values resulting from heating system-specific IEF_e, which the Evaluation Team was unable to verify. The per-unit first-year kWh savings values produced by the *ex ante* and *ex post* calculations are provided in Table 227.

Table 227. Manufactured Homes Program CFL Differences in Per Unit First Year Savings

Bulb Location	Measure	*Ex Ante* Per Unit kWh Savings	*Ex Post* Per Unit kWh Savings
Indoor	13 W CFL	16 - 42	35
	18 W CFL – Post-EISA	12 - 31	26
	18 W CFL – Pre-EISA	19 - 51	43
	23 W CFL – Post-EISA	32 - 44	37
Outdoor	13 W CFL	52	52
	18 W CFL – Post-EISA	38	38
	18 W CFL – Pre-EISA	63	63
	23 W CFL – Post-EISA	-	54

The majority (88%) of bulbs installed through the program were 13-watt CFLs, and this measure drives the realization rate for CFLs, as shown in Table 228.

Table 228. Manufactured Homes Program – CFL Savings by Bulb Wattage

Measure	Quantity Installed	*Ex Ante* Energy Savings (MWh)	*Ex Post* Verified Energy Savings (MWh)	Realization Rate
CFL - 13 Watt	6,913	240	233	97%
CFL - 18 Watt	748	25	26	103%
CFL - 23 Watt	224	8	8	102%
Total	7,885	272	267	98%

Water Heating Measures

EAI can only report energy savings for water heating measures when they are installed in residences with electric water heating. After reviewing the data, the Team determined that no faucet aerators or showerheads had been installed in residences with gas water heating, so all water heating measure savings were legitimate, and no adjustments were necessary. The implementer did not install pipe wrap during the program year.

Both the program implementer and the Evaluation Team calculated savings using the algorithms in TRM 3.0. The primary driver of the difference between *ex ante* kWh savings and *ex post* verified savings for

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both water heating measures was the verified installation rate calculated from the phone survey data. Savings calculations for each measure (aerators, showerheads, and pipe wrap) are discussed individually in the following sections.

Aerators

The Team calculated per aerator *ex ante* reported savings and *ex post* evaluated savings using the algorithm in the TRM 3.0 (Vol. 2, Sec. 2.3.4).

All parameter values are fixed, other than the mixed and supply water temperatures, which vary by weather zone. As a result, the algorithm produces a single per-unit aerator savings estimate for each of the four weather zones, as shown in Table 229.

Table 229. Manufactured Homes Program - Aerator Savings Comparison

Weather Zone	*Ex Ante* Per Unit kWh Savings	*Ex Post* Per Unit kWh Savings
9 - Fayetteville	34.59	34.55
8 - Fort Smith	34.27	34.26
7 - Little Rock	33.19	33.13
6 - El Dorado	31.73	31.70

Small differences in parameter values resulted in per-unit *ex post* energy savings that were 0.15% lower than the *ex ante* savings values calculated by the program implementer.

The Evaluation Team analyzed the phone survey responses to calculate a verified installation rate for faucet aerators. Table 230 provides a summary of the survey findings for faucet aerators.

Table 230. Manufactured Homes Program – Faucet Aerator Installation Verification

Parameter	Count	Percent
Number of Respondents	32	-
Tracking Data Aerator Quantity for Respondents	42	-
Verified Aerator Quantity*	37	88.1%
Aerator Quantity Still Installed at Time of Survey**	36	97.3%
Final Verified Installation Rate	36/42	85.7%

* Multiple survey questions, C1 and C8; see Appendix A.

** Multiple survey questions, C14, C16, and C17; see Appendix A.

In participant surveys, the Team asked respondents to report the number of program aerators still installed. If respondents reported that program aerators were not still installed, we asked if they had replaced them. Table 230 shows that respondent's verified installation of 37 of the 42 aerators recorded in the tracking system. Only one aerator was removed because "the sink clogged the aerator," which was not replaced, leaving 36 of the 42 aerators recorded in the tracking system still installed at the time of the phone survey. The Evaluation Team calculated a final verified installation rate of 85.7% from these responses and adjusted the gross kWh savings and gross demand reduction by this value.

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The Evaluation Team also analyzed the program implementer's verification site visit data to determine if that data could be used to calculate a comparison value for the verified aerator installation rate. Table 231 compares the measure quantities recorded in the tracking data to the quantities reported by the site inspector; it shows that the site inspection reported 68.8% of the aerators recorded in the tracking data.

Table 231. Manufactured Homes Program Implementer Site Inspection - Aerators

Parameter	Count	Installation Rate
Number of Residences Receiving Site Inspection	34	-
Tracking Data Aerator Quantity	32	-
Aerator Quantity Reported by Site Inspector	22	68.8%
Aerator Quantity Without Extra Aerator	21	65.6%

At one site, the inspector found one more aerator installed than was recorded in the tracking database. If this extra aerator is removed from the analysis, the site inspection reports 65.6% of the aerators recorded in the tracking data. For reasons discussed in the Review of Site Inspection Records section, the Team did not use site inspection findings to adjust savings for aerators.

The *ex post* verified energy savings include an adjustment for the verified installation percentage of 85.7%. All but one of the verified faucet aerators was still installed at the time of the phone survey. The verified installation rate is the primary driver of the faucet aerator realization rate of 86% for both energy savings and demand reductions (Table 232).

Table 232. Manufactured Homes Program – Verified Aerator Savings

Measure	Quantity Installed	*Ex Ante* Energy Savings (MWh)	*Ex Post* Verified Energy Savings (MWh)	Realization Rate
Aerators	1,694	56	48	86%

Showerheads

The Team calculated per showerhead *ex ante* reported savings and *ex post* evaluated savings using the algorithm in the TRM 3.0 (Vol. 2, Sec. 2.3.5).

All parameter values are fixed, other than the mixed and supply water temperatures that vary by weather zone. As a result, the algorithm produces a single per-unit showerhead savings estimate for each of the four weather zones, as shown in Table 233.

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Table 233. Manufactured Homes Program - Showerhead Savings Comparison

Weather Zone	*Ex Ante* Per Unit kWh Savings	*Ex Post* Per unit kWh Savings
9 - Fayetteville	308.37	308.09
8 - Fort Smith	305.54	305.67
7 - Little Rock	295.90	295.96
6 - El Dorado	282.86	283.03

Small differences in parameter values used by the program implementer to calculate *ex ante* energy savings resulted in *ex post* gross energy savings that were 0.02% higher in aggregate than the *ex ante* savings values.

The Evaluation Team analyzed the phone survey responses to calculate a verified installation rate for showerheads. A summary of the survey findings for showerheads are provided in Table 234.

Table 234. Manufactured Homes Program – Showerhead Installation Verification

Parameter	Count	Percent
Number of Respondents	32	-
Tracking Data Showerhead Quantity	33	-
Verified Showerhead Quantity*	32	97.0%
Showerhead Quantity Still Installed at Time of Survey**	32	100.0%
Final Verified Installation Rate	32/33	97.0%

* Multiple survey questions, C1 and C7; see Appendix A.

The tracking data recorded 33 showerheads installed at the homes of the 32 survey respondents. Of these 33 showerheads, respondents verified installation of 32, and reported that all 32 were still installed at the time of the survey. The Team calculated a verified installation rate of 97% for showerheads.

The Evaluation Team also analyzed the program implementer's verification site visit data to determine if it could be used to calculate a comparison value for the verified showerhead installation rate. Table 235 compares the measure quantities recorded in the tracking data to the quantities reported by the site inspector, showing that the site inspection reported 70.8% of the showerheads recorded in the tracking data.

Table 235. Manufactured Homes Program Implementer Site Inspection - Showerheads

Parameter	Count	Installation Rate
Number of Residences Receiving Site Inspection	34	-
Tracking Data Aerator Quantity	24	-
Showerhead Quantity Reported by Site Inspector	17	70.8%

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No extra showerheads were recorded by the site inspectors. For reasons discussed in the Review of Site Inspection Records section, the Evaluation Team did not use site inspection findings to adjust savings for showerheads.

The *ex post* verified energy savings include an adjustment for the verified installation of 97.0%. All verified showerheads were still installed at the time of the phone survey. The 100% verified installation rate is the primary driver of the showerhead realization rate of 97% for both energy savings and demand reductions (details in Table 236).

Table 236. Manufactured Homes Program – Verified Showerhead Savings

Measure	Quantity Installed	*Ex Ante* Energy Savings (MWh)	*Ex Post* Verified Energy Savings (MWh)	Realization Rate
Showerheads	1,272	375	364	97%

Pipe Wrap

The program implementer did not install pipe wrap in 2013 because the measure was not cost-effective.

Net-to-Gross Analysis

The Evaluation Team used the analysis approach outlined in the Evaluation Methodology section of this report to calculate freeridership rates for Manufactured Homes Program participants.

Manufactured Homes Participant Freeridership

As some customers installed more than one program measure, the Team assessed freeridership at the measure level, rather than at the participant level. The Team estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- *Prior Plans* - the respondent had pre-existing plans to purchase or install the measure prior to learning about the program,
- *Available Budget* - their budget could have accommodated the full cost of the measure, and
- *Stated Intent* - they would have installed the measure within a year without the program.

Table 237 shows the survey questions we used to assess freeridership for each criterion. The Team used the three freeridership criteria scores to determine overall program freeridership.

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Table 237. Manufactured Homes Program - Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans	Before learning about the Manufactured Homes Program, were you already planning to purchase and install the measures in 2013?
Available Budget	If the program had not existed, could your budget have accommodated the full cost of the [CFLs/aerators/showerheads] in 2013?*
Stated Intent	Without the program, would you have purchased the [CFLs/aerators/showerheads] sooner, at the same time, later in the same year, in one or two years, in three to five years, after more than five years, or not at all?

* The program implementer determined that pipe insulation was not cost-effective so they did not install it during the 2013 program year.

The Evaluation Team asked 32 Manufactured Homes Program participants about the 229 measures they installed through the program.[163] The Team identified respondents as freeriders if they met all three criteria regarding prior plans, available budget, and stated intent. Table 238 provides the number of measures associated with the responses to each question along with the percentage of respondents indicating freeridership.

Table 238. Manufactured Homes Program - Unweighted Freeridership Rate

Freeridership Criteria	Measures That Met Criteria					
	CFL		Faucet Aerator		Showerhead	
	n	Ratio	n	Ratio	n	Ratio
Prior Plans for Measure Installation	208	0.46	36	0.00	32	0.19
Available Budget	198	0.35	32	0.25	31	0.13
Stated Intent	178	0.40	36	0.08	30	0.10
Measure-level Unweighted Freeridership Ratio*	168	0.20	32	0.00	29	0.03
Program-level Unweighted Freeridership Ratio*			0.15			

* This is the ratio of measures meeting all three freeridership criteria.

At the measure level, the following measure quantities were associated with freeridership:

- 33 (20%) of 168 CFLs
- 0 (0%) of the 32 faucet aerators
- 1 (3%) of 29 showerheads.

[163] The Team asked respondents the freeridership questions about measures installed by the program auditors that were still installed. Twenty-one of 29 CFL recipients, 18 of 22 faucet aerator recipients, and 18 of 22 showerhead recipients provided valid responses to the freeridership questions.

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To account for the different savings values associated with each of the installed measures, the Evaluation Team weighted the freeridership results by the program savings associated with each measure to determine the final freeridership rate. The *ex post* gross energy savings associated with the three measures in the program tracking database was 17,684 kWh. To estimate net savings, the Team multiplied the gross savings for each measure by its NTG ratio (if a measure had a 0.10 freeridership ratio, then we multiplied the savings associated with that measure by 0.90, or 1 – 0.10). The total net savings were 13,119 kWh, with freeridership accounting for the remaining 1,275 kWh of the 14,394 kWh gross energy savings. The ratio of the net savings to gross savings results in a weighted net to gross ratio of 0.91, as shown in Table 239.

Table 239. Manufactured Homes Program – Freeridership Rate Weighted by Savings*

Measure Type	Total Measures	Freerider Measures	Freeridership Rate	Gross Savings (kWh)	Percent of Savings	Savings Netted Out (kWh)
CFLs	168	33	0.20	5,041	0.37	990
Faucet Aerators	32	0	0.00	1,063	0.08	0
Showerheads	28	1	0.03	8,290	0.56	296
Total	228	34	0.15	14,394		1,286
Savings Weighted Freeridership Rate			1,286 / 14,394 = 0.09			

* This is the number of measures and savings associated with responses meeting all three freeridership criteria

Manufactured Homes Program Participant Spillover

The Evaluation Team also asked participants about like-spillover measures. One (3%) of the 32 program respondents reported like-spillover by buying six CFLs outside of the program. This respondent indicated that their experience in the program was very important in their decision to purchase CFLs outside of the program, and said they did not receive a rebate from another program for those CFLs. The respondent noted that the CFLs were ENERGY STAR-rated.

No respondents reported purchasing any faucet aerators or showerheads for their homes without an EAI rebate.

The survey respondent did not specify the wattage of the six CFLs they purchased outside the program. *Ex post* per-unit gross energy savings for CFLs installed through the program ranged from 26 kWh to 63 kWh, depending on the wattage and installation location of the bulb. The Team made the conservative assumption that the CFLs were 13 watt and installed in indoor locations, with associated per-unit *ex post* energy savings of 35 kWh. To calculate program spillover, the Team multiplied the quantity of CFLs by the *ex post* per-unit gross energy savings, and divided the resulting value by the *ex post* gross program savings associated with the survey respondents. The resulting spillover was 1% of gross savings (Table 240).

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Table 240. Manufactured Homes Program - Spillover Ratio Calculation

Variable	Description	Value
Spillover-Eligible Measure Count	Number of measures installed outside of the program due to program influences	6 CFLs
Per-Unit Savings	Per-unit *ex post* gross energy savings for 13-watt CFL	35 kWh
Spillover-Eligible Measure Savings	Product of the number of spillover-eligible measures and the per-unit savings	210 kWh
Gross Program Savings	Savings corresponding to the 228 measures associated with the surveyed participant	14,394 kWh
Spillover Ratio	Spillover-eligible measure savings divided by the gross program savings	0.01

Manufactured Homes Net-to-Gross

Table 241 presents the NTG ratio for the Manufactured Homes Program.

Table 241. Manufactured Homes Program - Final Net-to-Gross Ratio Calculation

Parameter	Value
Weighted Freeridership Rate	0.09
NTG Ratio Not Accounting for Spillover	0.91
Spillover	0.01
Final Net-to-Gross Ratio	0.92

Evaluated Net Savings

Net savings are the product of the *ex post* evaluated savings and the NTG ratio. Table 242 provides the *ex post* net evaluated savings for energy, and Table 243 shows the *ex post* net evaluated savings for demand.

Table 242. Manufactured Homes Program Net Energy Savings

Measure	*Ex Post* Verified Gross Energy Savings (MWh)	*Ex Post* Net Energy Savings (MWh)	NTG Ratio
CFLs	267	246	92%
Aerators	48	44	92%
Showerheads	364	335	92%
Total	678	625	92%

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Table 243. Manufactured Homes Program Net Demand Reduction

Measure	*Ex Post* Verified Gross Demand Reduction (kW)	*Ex Post* Net Demand Reduction (kW)	NTG Ratio
CFLs	43	39	92%
Aerators	5	5	92%
Showerheads	38	35	92%
Total	86	79	92%

Ex ante reported energy and demand savings include an adjustment for an assumed program NTG ratio of 0.80; *ex post* evaluated net energy and demand savings include an adjustment for the evaluated NTG ratio of 0.92. Therefore, because there were only small differences between the *ex ante* and *ex post* gross savings and demand reduction calculations, the *ex post* verified gross realization rate is less than 100%, due primarily to the adjustments for verified installation rates

Evaluation Findings and Conclusions

Program Delivery and Implementation

The program was more accessible to customers throughout EAI's service territory due to expanded coverage in 2013.

As recommended by the Evaluation Team in 2012, EAI extended the program services beyond the Little Rock area and surrounding populations to reach more of its service territory, specifically focusing on smaller parks since the focus in 2012 had been on larger parks. As a result, the Manufactured Homes Program served 21% more residences in 2013 than in 2012, and covered a much broader geographic area of the state, including five manufactured home parks in El Dorado and several in Lonoke, Conway, and Pope counties (along the I-40 corridor; Figure 99).

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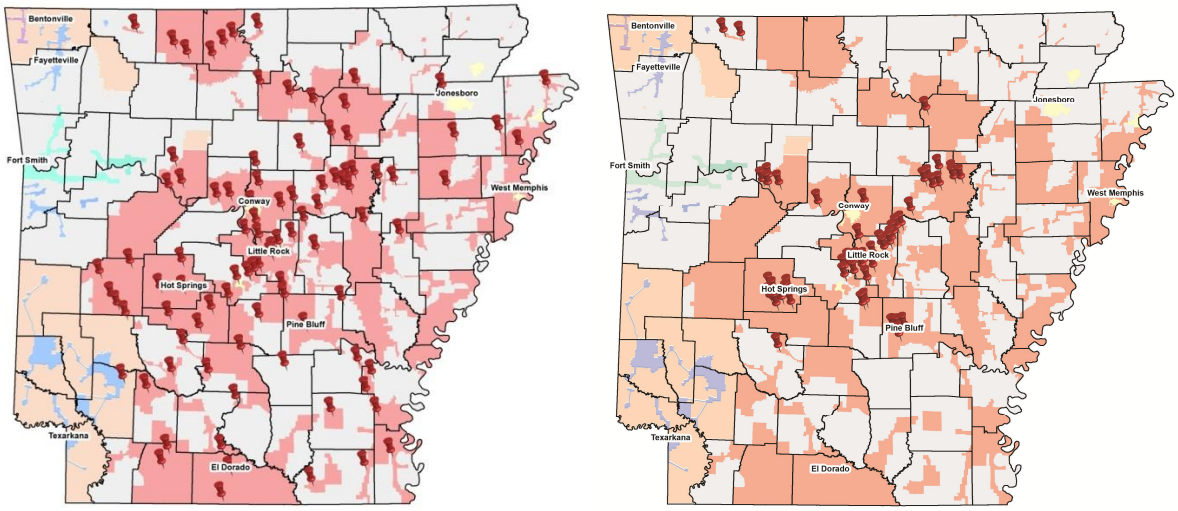
Figure 99. Distribution of Residences Served by the Manufactured Homes Program, 2013 (left) and 2012 (right)



Source: Evaluation Team analysis of ICF PY 2013 and PY 2012 Database Extracts.

Adding a fluent Spanish speaker to the implementation team increased program engagement with the Spanish speaking population.

Staff identified language barriers as a limiting factor to participation in 2012. The implementer tried to address this by hiring a rudimentary Spanish speaker, who had some success engaging customers. In 2013 the implementer hired a fluent Spanish speaker to support the installation team and decrease the language barrier. Implementation staff reported that having a fluent Spanish speaker as a program spokesperson has been essential to making it easier for Spanish-speaking residents to understand and participate in the program.

Clear signage on field staff vehicles and identifying badges eased participant concerns.

In 2012, implementation staff reported some resistance from manufactured homes residents who found it difficult to believe they were getting free energy-saving devices. However, in 2013 the implementer added signage to field technicians' vehicles and required all field staff to wear identifying badges on their uniforms. The implementer reported that these steps helped ease residents' concerns. In addition, staff noted that small details, such as carrying EAI Solutions-branded umbrellas, also helped assure skeptical homeowners that the installation crews were legitimate.

Interpersonal communication continues to be the most effective method to reach customers.

Based on lessons learned in 2012, the implementation staff focused their 2013 outreach efforts on generating neighbor to neighbor word-of-mouth support for the program, which proved to be effective in generating program leads. While implementer staff do not directly seek out the word-of-mouth support, they promoted it by maintaining a consistent professional image when installing measures and by going door-to-door in the mobile home communities. According to the implementer, installers said this approach was as or more effective at generating word-of-mouth support than the few community

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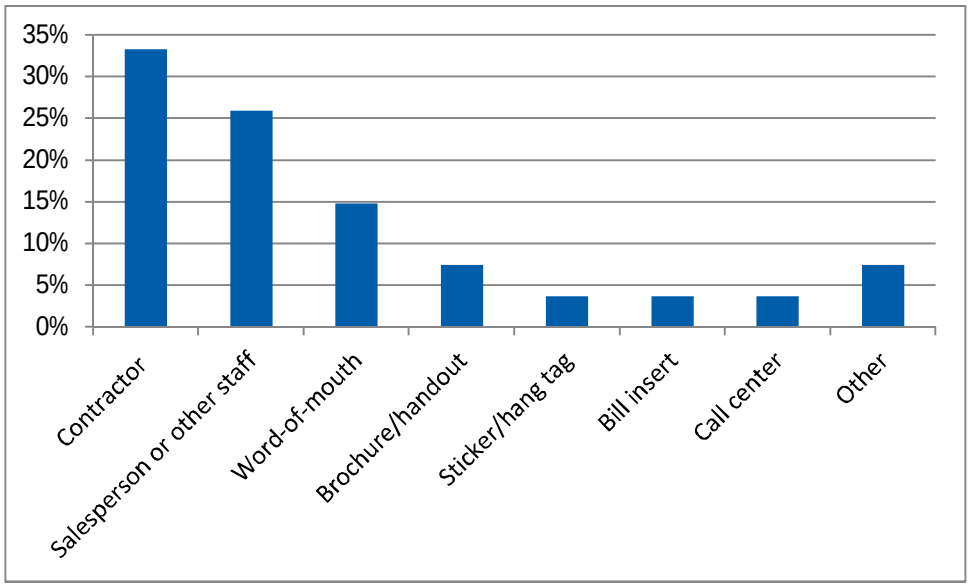
events held in 2012. Participant surveys modestly support this opinion, with 15% of customers reporting having heard about the program through word-of-mouth. However, customers most often reported hearing about the program from their contractors (33%), which supports the door-to-door approach used during 2013 (Figure 100).

Figure 100. How Residents First Heard About the Program



QA4. How did you first hear about the Manufactured Homes Program? (n=27)

Customer Satisfaction

Participants were satisfied with the program and with EAI.

The majority of survey participants reported being very satisfied with the direct install measures and with the program overall (Table 244), giving a "very satisfied" or "somewhat satisfied" rating in every category. These results correlate with the satisfaction ratings participants provided to installation staff at the time the measures were installed. The satisfaction results the implementation staff recorded at the time customers received program services indicated that 97% of the 1,015 participants were very satisfied with the measures installed.

Table 244. Satisfaction with Manufactured Housing Program Measures and Overall

Satisfaction Ranking	CFLs (n=28)	Showerheads (n=20)	Aerators (n=20)	Overall Program Satisfaction (n=28)
Very Satisfied	86%	95%	80%	88%
Somewhat Satisfied	7%	5%	15%	9%
Not too Satisfied	7%	0%	5%	0%
Not at all Satisfied	0%	0%	0%	0

QE1 through QE4- How satisfied are you with the [measure] you received through the Manufactured Homes program?

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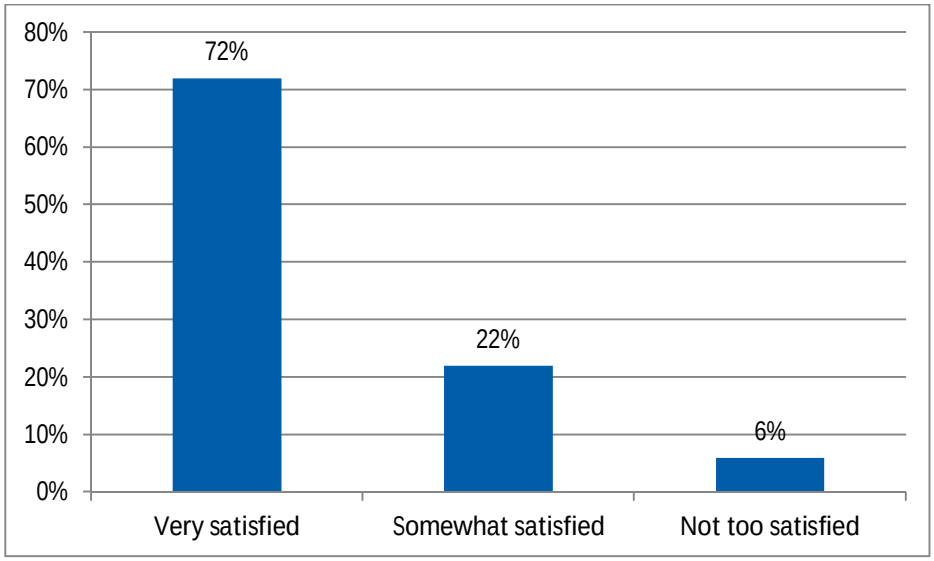
In addition, the vast majority of participants reported being very satisfied (72%) or somewhat satisfied (22%) with EAI as an electric service provider (Figure 101).

Figure 101. Participant Satisfaction With EAI as an Electric Service Provider



QE6. Overall, how satisfied are you with Entergy as an electric service provider? (n=32)

Program participation inspired some customers to make more energy-efficiency improvements.

Six participants (19%) reported installing unrebated energy-saving measures after participating in the program. These included CFLs, efficient room air conditioners, an energy-efficient refrigerator, and duct sealing. Five of these six participants said their experience with the Manufactured Homes Program was very important to their decision to add these measures.

Measure Verification

Site visit inspectors failed to collect installed measure verification data.

In 2013, the program implementer made it a higher priority to verify that measures were installed correctly and in high traffic areas, and to assess customer satisfaction, during QA/QC site visits. While the program implementer also conducts phone survey verification, site visits present a valuable opportunity for an independent party (i.e., not the participant) to verify that the measures recorded in the database are still installed.

Evaluation Recommendations

Recommendations for the Manufactured Homes Program are outlined below.

Structure QA/QC site visits to collect installed measure verification data.

The Evaluation Team recommends that the implementer prioritize verifying the measures installed for the 2014 program year. Adding this step to the inspection process should not pose a significant extra burden on the inspector or customer, and the verification that the measures recorded in the database are still installed will support the evaluation process.

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Energy Solutions for Multifamily Program

Through the Multifamily Program, EAI provides cost-effective energy-efficiency measures to multifamily properties (those with five or more units) throughout its service territory. ICF implements the program, providing energy assessments of qualifying properties to identify cost-effective energy-efficiency upgrades, as well as free direct install measures in tenant spaces and common areas. ICF provides property owners/managers with a summary report of recommended equipment upgrades, the property's potential energy savings, and information about other EAI programs for which they may be eligible.

The following measures are available for direct installation in eligible properties:

- CFLs that replace incandescent bulbs in fixtures and lamps
- 1.5 gpm showerheads
- 1.5 gpm faucet aerators

For the water heating measures—showerheads and faucet aerators—EAI claims energy and demand savings only in properties with electric water heating and where the measures replace existing fixtures with flow rates of 2.0 gpm or greater.

Program Status Overview

The Multifamily Program achieved 170% of its 2013 energy-savings goal and 93% of its demand reduction target. However, the program met only 23% of its participation goal of serving 408 apartment complexes in 2013. This suggests that the program achieved significantly more savings per complex than anticipated. Table 245 provides a summary of results.

Table 245. Multifamily Program 2013 Participation and Net Savings Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	455	774	170%
Demand Savings (MW)*	0.11	0.10	93%
Participation (apartment complexes)	408	92	23%
Budget	$426,021	$567,372	133%

* These values represent evaluated net savings and reflect the application of an 8.49% line loss factor.

Staff reported they were able to reallocate funds from a different, underperforming program in the portfolio, and to capitalize on the program's strong performance they set a revised internal goal of 712 MWh for the Multifamily program. EAI also exceeded this revised goal by 9%.

Staff attributed the program success to the implementer developing strong contacts with building owners and managers in 2013. ICF developed a database for outreach and recruiting to support these efforts, which focused mainly on membership lists for city/regional associations such as Builder Owner

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and Managements Association chapters, and Institute for Real Estate Management chapters. ICF also tracked local government permitting, where available, to identify projects that could generate qualified leads. In addition, based on a 2012 recommendation, ICF made a concerted effort to reach out to property managers in the southern and eastern portions of the state in 2013.

Status of 2012 Evaluation Recommendations

Table 246 lists the status of each of the Multifamily Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report*. Program staff completed all of the 2012 recommendations during the 2013 program year.

Table 246. 2013 Status of 2012 Multifamily Program Recommendations

2012 Recommendation	2013 Status
Use the experience gained during the first program years to refine and improve goal-setting.	*Completed.* Program and implementation staff increased the internal program energy savings goal and reallocated budget to the Multifamily Program to support goal attainment.
Continue to focus on promoting the program directly to corporate management and professional groups through attendance at public meetings.	*Completed.* Program staff continued to promote the program as recommended.
If needed to boost participation as the program matures, consider further diversifying the marketing strategy by advertising in property management industry publications and through more traditional mass media tactics.	*Completed (Considered/Rejected).* Implementation staff determined that additional marketing outreach activities were not required to meet the 2013 goals.
Continue providing effective statewide coverage of multifamily direct install measures, particularly focusing on southern portions of the state, such as the area around El Dorado.	*Completed.* The implementation staff worked to develop a partnership with the Area Agency on Aging of Southeast Arkansas to expand program activity in Southern Arkansas.
Assuming the program scope does not change, continue budgeting at current funding and staffing levels.	*Completed.* EAI increased its internal goals and reallocated budgets between programs in the portfolio mid-year to support achieving the increased goals.
Fine-tune the program manual flow chart to more specifically represent multifamily housing program activities.	*Completed.* Implementation staff added program-specific elements to the flow chart.
Collect all measure parameters necessary to calculate reported savings as required for TRM 2.0 algorithms. While default values exist for water heater setpoints, and weather zones can be determined from the premise ZIP code, ICF should add these measure parameters to its data collection form so that field staff can collect the information at the time of measure installation.	*Completed (Considered/Rejected).* Program staff considered this recommendation but decided it was cost prohibitive.
Implement protocols for field staff to provide the	*N/A.* The 2013 program tracking database did not

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2012 Recommendation	2013 Status
energy savings factor for lighting measures as well as water heating measures, and store all entries for this parameter in numeric format.	contain records for measures for which EAI does not claim savings, therefore this recommendation is no longer relevant.
Consider conducting primary research to determine a NTG ratio for the 2013 program year.	*Completed.* The Evaluation Team included NTG research as part of the Multifamily and Manufactured Homes programs' participant survey in 2013.

Analysis Methodology

For the Multifamily Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities:[164]

- Year End Interviews
  - Utility Program Manager (n=1)
  - Implementation Program Manager (n=1)
- Participant Surveys (n=103)
- Calculation of TRM-Based Savings
- Program Attribution Analysis (NTG)
- Database Review

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

Impacts Summary

The Evaluation Team conducted an impact analysis of the Multifamily Program, which consisted of a database review and participant phone surveys to:

- Verify measure installation and calculate a verified installation rate
- Estimate the NTG ratio for the program
- Calculate *ex post* verified gross and net energy savings and demand reductions

Table 247 and Table 248 shows the program net annual goals for 2013, as well as the reported (*ex ante*) and evaluated (*ex post*) net annual energy savings and demand reduction. All energy and demand values include an 8.49% adjustment for transmission and distribution line losses. Goals and *ex ante* net savings reflect the application of an assumed program NTG ratio of 0.80. *Ex post* net savings reflect application of the evaluated NTG ratio of 0.95.

[164] The Evaluation Team conducted a condensed process evaluation of the Multifamily Program.

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Table 247. Multifamily Program Net Energy Savings Results

Energy Savings Goal (MWh)	Net Evaluated Energy Savings (MWh)	Percent of Energy Savings Achieved
455	774	170%

Table 248. Multifamily Program Demand Reduction Results

Demand Reduction Goal (MW)	Net Evaluated Demand Reduction (MW)	Percent of Demand Goal Achieved
0.111	0.103	93%

Review of Program Tracking Data

The Evaluation Team conducted a desk review of the program tracking data to ensure savings were consistent with the Arkansas TRM 3.0 and claimed only where appropriate. . Additionally, the Team checked parameter values to verify that they were sufficient to calculate savings according to the algorithms in the TRM and were within reasonable ranges.

Savings Verification

The Evaluation Team's *ex post* evaluated savings calculations included adjustments for the effects of EISA on installed lighting measures,[165] for domestic hot water measures installed in residences with gas water heating or in common areas, and for the verified installation rate of measures where primary data such as phone survey verification or on-site inspection data was available.

Review of Site Inspection Records

This program evaluation budget did not allow for the Evaluation Team to conduct post-installation verification site inspections; however, the program implementer conducted site inspections on a sample of 61 treated residences as part of their QA procedures. The Evaluation Team requested and reviewed all available QA data and compared the installed measures and quantities in the program tracking database to those in the site inspection records.

The implementer provided QA site inspection data in PDF format. The Evaluation Team created a database from these PDF documents in order to merge the site inspection data with the program tracking database. The PDF documents did not include a key value with which to tie the two data sources together, such as the program implementer's JobID, so the Team matched the site inspection data with the tracking data by customer name and address, successfully matching 45 of the 61 site inspection records. Of these 45 records, 16 inspections occurred more than three months after the installation date (five of these occurred nine months after the installation dates); for 14 homes, 10 site inspections occurred during the same month as the installation date and 15 occurred approximately

[165] http://www.gpo.gov/fdsys/pkg/BILLS-110hr6enr/pdf/BILLS-110hr6enr.pdf.

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three months after the installation date (two site inspections occurred on the same day as the measure installations).

The *Manufactured/Mobile Home Direct Install and Survey Program and Procedure Manual* states that the QA/QC survey of the residence will consist of:

1. "Confirming products in these units were installed correctly.
2. Confirming the number of products installed match with the number recorded.
3. Confirming materials installed in line with program standards (for example bulbs installed in high usage areas).
4. Verifying no leaks in faucet aerators and showerheads."[166]

The program implementer reported that they conduct QA/QC for the Multifamily through site inspections that focus on points 1, 3, and 4. Because the Evaluation Team fielded a participant phone survey with questions designed for the express purpose of verifying installed measure quantities (point 2 above), we used this data to inform our energy savings and demand reduction analysis. We report summary statistics from the program implementer's site visits for informational purposes only.

Evaluated Gross Savings Analysis and TRM Review

The Evaluation Team reviewed the tracking database provided by the program implementer to determine if they collected the data necessary to calculate savings using the algorithms in TRM 3.0. Table 249 summarizes the TRM parameters that were not collected in the 2013 tracking data, along with available default values.

Table 249. Missing TRM 3.0 Parameters: Multifamily Program

Measure	Missing Parameter	Default Value Available
CFLs	Wattage of Bulbs Removed	Table 135
	Heating Type	Table 138 – Use default value of 0.79 for unknown heating type
Aerators	Weather Zone	Map by ZIP code
Showerheads	Weather Zone	Map by ZIP code

The tracking database includes fields for weather station and weather zone, as well as four fields for heating system, but these fields are not populated.

The program implementer calculated *ex ante* savings per measure installed for the program using algorithms in TRM 3.0. The Team also calculated the *ex post* evaluated savings using the algorithms provided in TRM 3.0.

Table 250 and Table 251 provide the energy and demand savings by measure. These savings are estimated at the point-of-use and thus do not include line losses.

[166] ICF International. *Manufactured/Mobile Home Direct Install and Survey Program and Procedure Manual.* page 10. Updated July 9, 2013.

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Table 250. Multifamily Program *Ex Ante* and *Ex Post* Gross Energy Savings

Measure	*Ex Ante* Energy Savings (MWh)	*Ex Post Verified* Energy Savings (MWh)	Realization Rate
CFLs	356	380	107%
Aerators	79	61	78%
Showerheads	330	306	92%
Total	765	747	98%

Table 251. Multifamily Program *Ex Ante* and *Ex Post* Gross Peak Coincident Demand Reduction

Measure	*Ex Ante* Demand Reduction (kW)	*Ex Post* Verified Demand Reduction (kW)	Realization Rate
CFLs	73.9	61.7	83%
Aerators	8.2	6.4	78%
Showerheads	34.4	31.8	92%
Total	116.5	99.9	86%

CFLs

The Evaluation Team calculated energy savings and demand reductions in accordance with the algorithms in TRM 3.0 (Vol. 2, Sec. 2.5), which account for the impacts of EISA. These algorithms also incorporate parameters for the bulb ISR, as well as IEFs to account for the decrease in the cooling load associated with replacing incandescent bulbs. TRM 3.0 adds a gas heating penalty IEF.

To determine *ex ante* savings, the Team replaced parameter values provided in TRM 3.0 with the values we calculated using data collected in our residential light logging study. This study is described in detail in the Residential Lighting and Appliances Program section.

In the TRM 3.0, the IEF_E ranged from 0.43 for homes heated with electric resistance heat to 1.14 for homes heated with gas. It specifies that the calculations for *ex ante* savings should use a heating system-specific IEF_E or, alternatively, a default value where "heat type cannot be determined."[167] As the tracking data provided no information about the heating system, the Team used the default value.

TRM 3.0 specifies an ISR of 0.97 for measures installed through a direct install program, and the Team used this value in the *ex post* gross kWh savings calculations for CFLs.

The light logger study revealed indoor daily bulb use of 2.17 hours, or, on an annualized basis, 792.6 AOH. The Team used the evaluated indoor HOU in its savings calculations.

[167] Frontier Associates, LLC. *Arkansas Technical Reference Manual Version 3.0 Volume 2: Deemed Savings*. Page 124. August 30, 2013. Arkansas Public Services Commission Docket No. 10-100-R, Order No. 18. September 12, 2013. Available online: http://www.apscservices.info/EEInfo/TRM.pdf.

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EISA regulations affected the baseline wattage of 23-watt and 18-watt CFLs in 2013. For 23-watt CFLs, all bulbs were installed during the post-EISA period (i.e., on or after July 1, 2012), so the Team calculated savings for all bulbs using the post-EISA reduced baseline wattage of 72 watts. For 18-watt CFLs, the Team calculated energy savings using a pre-EISA baseline of 75 watts for any bulb installed before July 1, 2013, and used 53 watts for bulbs installed on or after July 1, 2013. All 13-watt CFLs were installed in the pre-EISA period, as EISA regulations did not take effect for 60-watt and 40-watt incandescent bulbs until January 1, 2014. The Team assumed a baseline wattage of 60 watts for 13-watt CFLs.

In October 2013, the Evaluation Team fielded participant phone surveys and achieved responses from 103 participants in the Multifamily Program. These data provide precision of 7.9% at the 90% confidence level. During the survey, we asked respondents to verify the number of bulbs installed during the program. A summary of the findings for CFLs are presented in Table 252.

Table 252. Multifamily Program CFL Verified Measure Quantity and Installation Persistence

Parameter	Count	Percent
Tracking Data Bulb Quantity for Respondents	558	-
Verified Bulb Quantity Received from Program*	520	93.2%
Verified Bulb Quantity Still Installed at Time of Survey**	510	98.1%
Final Verified Installation Rate	510/558	91.4%

* Multiple survey questions, C1 and C6; see Appendix A.

The Team also asked survey respondents to report the number of program bulbs still installed. If respondents reported that program bulbs were not still installed, we asked if they had replaced them, and if so, with what type of bulb. As Table 252 shows, 510 of the 520 verified bulb installations were still installed at the time of the phone survey. Two respondents reported removing seven of the 10 remaining bulbs, noting that they had burned out. One respondent reported replacing their five failed CFLs with "the type of bulbs I had before," i.e., not CFLs; the other respondent stated that they did not replace their two CFL bulbs with other bulbs at all. For the remaining three verified bulbs, the respondent did not provide details about the removed bulbs. The Evaluation Team calculated a verified installation rate of 91.4% from these responses and adjusted the gross kWh savings and gross demand reduction by this value.

The Evaluation Team also analyzed the program implementer's verification site visit data to determine if it could be used to calculate a comparison value for the verified lighting measure installation rate. Table 253 compares the measure quantities recorded in the tracking data with the quantities reported by the site inspector, showing that the site inspector reported 88% of the bulbs recorded in the tracking data. While the implementer's site visit value is consistent with the Team's phone survey results, we deferred to the Team's value for reasons stated above.

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Table 253. Multifamily Program CFL Site Inspection Quantities

Parameter	Tracking Data Quantity	Site Inspection Quantity	Installation Rate
CFL - 13 Watt	208	187	90%
CFL - 18 Watt	8	3	38%
CFL - 23 Watt	-	-	-
All CFLs	216	190	88%

Out of the 11,832 bulbs installed through the Multifamily Program, only 145 (1%) were 23-watt CFLs. None of the 61 residences visited during the site inspections received any 23-watt CFLs, so there were no bulbs to verify during the inspections.

Some quantities recorded during the site inspection were higher than the measure quantities recorded in the tracking database. If these excess bulbs are removed from the analysis, the installation rate is 80%. For reasons discussed in the Review of Site Inspection Records section, we did not use the site inspection findings to adjust savings for CFLs.

The realization rate for CFLs is driven by the verified installation rate of 91.4% and the differences between the TRM 3.0 algorithm parameters and the evaluated parameter values determined through the light logging study. The Evaluation Team used the weighted average value for all the IEF_e Evaluation Team calculations and consequently there is one per-unit kWh savings value for each bulb type, location, and EISA period. For bulbs installed indoors, the *ex ante* calculations produced a range of per-unit values resulting from heating system-specific energy IEFs that the Evaluation Team was unable to verify. The per-unit first-year kWh savings values produced by the *ex ante* and *ex post* calculations are provided in Table 254.

Table 254. Multifamily Program Differences in Per-Unit First-Year Savings – CFLs

Bulb Location	Measure	*Ex Ante* Per-Unit kWh Savings	*Ex Post* Per-Unit kWh Savings
Indoor	13 W CFL	16 - 42	35
	18 W CFL – Post-EISA	12 - 31	26
	18 W CFL – Pre-EISA	19 - 51	43
	23 W CFL – Post-EISA	32 - 44	37
Outdoor	13 W CFL	52	52
	18 W CFL – Post-EISA	38	38
	18 W CFL – Pre-EISA	63	63
	23 W CFL – Post-EISA	-	54

The majority (91%) of bulbs installed through the program were 13-watt CFLs, and this measure drives the gross realization rate for CFLs, as shown in Table 255.

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Table 255. Multifamily Program CFL Savings by Bulb Wattage

Measure	Quantity Installed	*Ex Ante* Energy Savings (MWh)	*Ex Post* Verified Energy Savings (MWh)	Gross Realization Rate
CFL - 13 Watt	10,808	327	347	106%
CFL - 18 Watt	879	24	28	118%
CFL - 23 Watt	145	5	5	107%
Total	11,832	356	380	107%

Water Heating Measures

EAI can only report energy savings for water heating measures when they are installed in residences with electric water heating. After reviewing the data, the Team determined that no faucet aerators or showerheads had been installed in residences with gas water heating, so all water heating measure savings were appropriate, and no adjustments to savings were necessary. The implementer did not install pipe wrap during the program year.

Both the program implementer and the Evaluation Team calculated savings using the algorithms in the TRM 3.0. The primary driver of the difference between *ex ante* kWh savings and *ex post* verified savings for both water heating measures was the verified installation rate calculated from the phone survey data. Savings calculations for each measure (aerators, showerheads, and pipe wrap) are discussed individually in the following sections.

Aerators

The Team calculated per aerator *ex ante* reported savings and *ex post* evaluated savings, using the algorithm in the TRM 3.0 (Vol. 2, Sec. 2.3.4). All parameter values are fixed, other than the mixed and supply water temperatures, which vary by weather zone. As a result, the algorithm produces a single per-unit aerator savings estimate for each of the four weather zones, as shown in Table 256.

Table 256. Multifamily Program Aerator Savings Comparison

Weather Zone	*Ex Ante* Per-Unit kWh Savings	*Ex Post* Per-Unit kWh Savings
9 - Fayetteville	34.59	34.55
8 - Fort Smith	34.27	34.26
7 - Little Rock	33.19	33.13
6 - El Dorado	31.73	31.70

Small differences in parameter values resulted in per-unit *ex post* energy savings that were 0.15% lower than the *ex ante* savings values calculated by the program implementer.

The Team noted that the *ex ante* per-unit savings were not consistent by weather zone; records in one weather zone had the per-unit savings from a different weather zone. This indicated that the implementer used different weather zone mapping for *ex ante* calculations than the Evaluation Team used in the *ex post* calculations. The Evaluation Team mapped weather zones to the ZIP code of the participant service address. *Ex ante* weather zone assignments correspond to the "County" field

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provided in the data. The Team reviewed the weather zone mapping of the records in question and determined that the data in the "County" field was incorrect for these records, and therefore, the implementer's weather zone mapping was also incorrect. The savings differences that resulted, along with small differences in parameter values used by the program implementer to calculate *ex ante* energy savings, resulted in *ex post* gross energy savings that were 0.22% lower than the *ex ante* savings values.

The Evaluation Team analyzed the phone survey responses and calculated a verified installation rate and installation persistence rate for faucet aerators. These are provided in Table 257.

Table 257. Multifamily Program Phone Survey Aerator Installation Verification

Parameter	Count	Percent
Number of Respondents	103	-
Tracking Data Aerator Quantity for Respondents	146	-
Verified Aerator Quantity*	117	80.1%
Aerator Quantity Still Installed at Time of Survey[2]	114	97.4%
Final Verified Installation Rate	114/146	78.0%

* Multiple survey questions, C1 and C8; see Appendix A.

** Multiple survey questions, C14, C16, and C17; see Appendix A.

In participant surveys, the Team asked respondents to report the number of program aerators still installed. If respondents reported that program aerators were not still installed, we asked if they had replaced them. Table 257 shows that respondent's verified the installation of 117 of the 146 aerators recorded in the tracking system. Respondents reported removing three program aerators for the following reasons:

- "Water pressure was too low"
- "Didn't work with the sprayer/water filter"
- "Installed incorrectly."

All three respondents that removed program aerators replaced them with the type of aerator they had before. The Evaluation Team calculated a final verified installation rate of 78.0% from these responses and adjusted the gross kWh savings and gross demand reduction by this value. The Evaluation Team also analyzed the program implementer's verification site visit data to determine if that data could be used to calculate a comparison value for the verified aerator installation rate. A summary of these findings is provided in Table 258.

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Table 258. Multifamily Program Implementer Site Inspection - Aerators

Parameter	Count	Installation Rate
Number of Residences Receiving Site Inspection	61	-
Tracking Data Aerator Quantity	52	-
Aerator Quantity Reported by Site Inspector	49	94%
Aerator Quantity Minus Extra Aerator	48	92%

There were 52 faucet aerators recorded in the tracking database for sites in the verification site visit sample of 61 residences. Site inspectors recorded 49 faucet aerators, for an installation rate of 94%. At one residence, the site inspector recorded two aerators where the tracking data reported one. If this extra aerator is removed from the persistence calculation, the installation rate is 92%. For reasons discussed in the Review of Site Inspection Records section, we did not use the site inspection findings to adjust savings for aerators.

The *ex post* verified energy savings include an adjustment for the verified installation percentage of 78%. Ninety-seven percent of the verified faucet aerators were still installed at the time of the phone survey. The verified installation rate is the primary driver of the faucet aerator gross realization rate of 78% for both energy savings and demand reductions (Table 259).

Table 259. Multifamily Program Verified Aerator Savings

Measure	Quantity Installed	*Ex Ante* Energy Savings (MWh)	*Ex Post* Verified Energy Savings (MWh)	Gross Realization Rate
Aerators	2,380	79	61	78%

Showerheads

The Team calculated per showerhead *ex ante* reported savings and *ex post* evaluated savings using the algorithm in the TRM 3.0 (Vol. 2, Sec. 2.3.5).

All parameter values are fixed, other than the mixed and supply water temperatures, which vary by weather zone. As a result, the algorithm produces a single per-unit showerhead savings estimate for each of the four weather zones, as shown in Table 260.

Table 260. Multifamily Program Showerhead Savings Comparison

Weather Zone	*Ex Ante* Per Unit kWh Savings	*Ex Post* Per unit kWh Savings
9 - Fayetteville	308.37	308.05
8 - Fort Smith	305.54	305.63
7 - Little Rock	295.90	295.92
6 - El Dorado	282.86	282.99

The Team found the same inconsistency with weather zone mapping for showerheads as reported above for faucet aerators. When we corrected for this error, the savings differences, along with small

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differences in parameter values used by the program implementer to calculate *ex ante* energy savings, resulted in *ex post* gross energy savings that are 0.04% lower than the *ex ante* savings values.

The Evaluation Team analyzed the phone survey responses to calculate a verified installation rate for showerheads. A summary of the survey findings for showerheads are provided in Table 261.

Table 261. Multifamily Program Phone Survey Showerhead Installation Verification

Parameter	Count	Percent
Number of Respondents	103	-
Tracking Data Showerhead Quantity	67	-
Verified Showerhead Quantity*	64	95.5%
Showerhead Quantity Still Installed at Time of Survey**	62	96.9%
Final Verified Installation Rate	62/67	92.5%

* Multiple survey questions, C1 and C7; see Appendix A.

The tracking data recorded 67 showerheads installed at the homes of the 103 survey respondents. Of these 67 showerheads, respondents verified installation of 64 showerheads, and reported that 62 were still installed at the time of the survey. The Team calculated a verified installation rate of 92.5% for faucet aerators.

The Evaluation Team also analyzed the program implementer's verification site visit data to determine if that data could be used to calculate a comparison value for the verified showerhead installation rate. A summary of the survey findings for showerheads are provided in Table 262.

Table 262. Multifamily Program Implementer Site Inspection - Showerheads

Parameter	Count	Installation Rate
Number of Residences Receiving Site Inspection	61	-
Tracking Data Showerhead Quantity	27	-
Showerhead Quantity Reported by Site Inspector	26	96.3%

Site inspectors visited 61 multifamily participant residences, and the tracking data for these residences recorded installation of 27 low-flow showerheads. Site inspectors reported 26 low-flow showerheads, for an installation rate of 96.3%. All measure quantities recorded in the site inspection were equal to or lower than those recorded in the program tracking database. For reasons discussed in the Review of Site Inspection Records section, the Team did not use the site inspection findings to adjust savings for aerators.

The *ex post* verified energy savings include an adjustment for the verified installation rate of 92.5%. All but two verified showerheads were still installed at the time of the phone survey. The verified installation rate is the primary driver of the showerhead realization rate of 92% for both energy savings and demand reductions (Table 263).

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Table 263. Multifamily Program Verified Showerhead Savings

Measure	Quantity Installed	*Ex Ante* Energy Savings (MWh)	*Ex Post* Verified Energy Savings (MWh)	Realization Rate
Showerheads	1,118	330	306	92%

Pipe Wrap

The program implementer determined that pipe insulation was not cost-effective, so did not install it during the 2013 program year.

Net-to-Gross Analysis

The Evaluation Team used the analysis approach outlined in the Methodology of this report to calculate freeridership rates for Multifamily Program participants.

Multifamily Participant Freeridership

As some customers installed more than one program measure, the Team assessed freeridership at the measure level, rather than at the participant level. The Team estimated the overall participant freeridership rate for the program by identifying measures for which the respondent met the following criteria:

- *Prior Plans* - the respondent had pre-existing plans to purchase or install the measure prior to learning about the program,
- *Available Budget* - their budget could have accommodated the full cost of the measure, and
- *Stated Intent* - they would have installed the measure within a year without the program.

Table 264 shows the survey questions we used to assess freeridership for each criterion. The Team used the three freeridership criteria scores to determine overall program freeridership.

Table 264. Multifamily Program Freeridership Questions

Freeridership Criteria	Survey Question
Prior Plans	Before learning about the Multifamily Program, were you already planning to purchase and install the measures in 2013?
Available Budget	If the program had not existed, could your budget have accommodated the full cost of the [CFLs/Aerators/Showerheads] in 2013?*
Stated Intent	Without the program, would you have purchased the [CFLs/Aerators/Showerheads] sooner, at the same time, later in the same year, in one or two years, in three to five years, after more than five years, or not at all?

* The program implementer determined that pipe insulation was not cost-effective, so did not install it during the 2013 program year.

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The Evaluation Team asked 92 Multifamily Program participants about the 569 measures they installed through the program.[168] The Team identified respondents as freeriders if they met all three criteria regarding prior plans, available budget, and stated intent. Table 265 provides the number of measures associated with the responses to each question, along with the percentage of respondents indicating freeridership. The program-level unweighted freeridership is the proportion of all measures that met all three freeridership criteria.

Table 265. Multifamily Program Unweighted Freeridership Rate

Freeridership Criteria	Proportion of Measures that Met Criteria		
	CFL	Faucet Aerator	Showerhead
Prior Plans for Measure Installation	0.23	0.02	0.15
Available Budget	0.31	0.32	0.21
Stated Intent	0.36	0.19	0.10
Measure-Level Unweighted Freeridership Ratio*	0.07	0.01	0.05
Program-Level Unweighted Freeridership Ratio*	0.06		

[1]Proportion of measures meeting all three freeridership criteria.

Overall, the survey respondents indicated that 34 of the 569 measures installed through the program were associated with responses indicating freeridership in all three questions, resulting in an unweighted freeridership ratio of 0.06.

To account for the different savings values associated with each of the installed measures, the Evaluation Team weighted the freeridership results by the program savings associated with each measure to determine the final freeridership rate. The total *ex post* gross energy savings associated with the three measures in the program tracking database was 27,351 kWh. To estimate a weighted freerider rate, the Team multiplied the gross savings for each measure by its freerider rate, summed and divided by the total gross savings. The total net savings were 25,829 kWh, with freeridership accounting for the remaining 1,528 kWh of the 27,351 kWh gross energy savings.

The ratio of the net savings to gross savings results in a weighted freeridership ratio of 0.94 as shown in Table 266.

[168] The Team only asked freeridership questions of respondents who could provide confirmation that the measures installed by the program auditors were still installed. Seventy-six of 100 CFL recipients, 70 of 89 faucet aerator recipients and 39 of 65 showerhead recipients provided valid responses to the freeridership questions and had verified data in the program tracking database.

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Table 266. Multifamily Program Freeridership Rate Weighted by Savings*

Measure Type	Total Measures	Freerider Measures*	Freeridership Rate	Gross Savings (kWh)	Percent of Savings	Savings Netted Out (kWh)
CFLs	430	31	0.07	12,583	46%	907
Faucet Aerators	100	1	0.01	3,298	12%	33
Showerheads	39	2	0.05	11,470	42%	588
Total	569	34	0.06	27,351	100%	1,528
Savings-Weighted Freeridership Ratio				1,528 / 27,351 = 0.06		

* This table represents the number of measures and savings associated with responses meeting all three freeridership criteria

Multifamily Solutions Program Participant Spillover

The Evaluation Team also asked participants about like-spillover measures. Two of the 92 program respondents (2%) reported like-spillover, from buying six CFLs outside of the program. Both respondents indicated that their experience in the program was very important in their decision to purchase CFLs outside of the program, and did not receive rebates from other programs for those CFLs. The respondents noted that the CFLs were ENERGY STAR-rated.

No respondents reported purchasing any faucet aerators or showerheads for their homes without an EAI rebate.

The survey respondents did not specify the wattage of the six CFLs purchased outside the program. *Ex post* per-unit gross energy savings for CFLs installed through the program ranged from 22 kWh to 63 kWh, depending on the wattage and installation location of the bulb. The Team made the assumption that the bulbs were 23-watt CFLs installed in indoor locations, with associated per-unit *ex post* energy savings of 35 kWh. To calculate program spillover, the Team multiplied the quantity of CFLs by the *ex post* per-unit gross energy savings, and divided the resulting value by the *ex post* gross program savings associated with the survey respondents. The resulting spillover rate was 1% of gross savings (Table 267).

Table 267. Multifamily Program Spillover Ratio Calculation

Variable	Description	Value
Spillover-Eligible Measure Count	Number of measures installed outside of the program due to program influences	6 CFLs
Per-Unit Savings	Per-unit *ex post* gross energy savings for 23-watt CFL	35 kWh
Spillover-Eligible Measure Savings	Product of the number of spillover-eligible measures and the per-unit savings	210 kWh
Gross Program Savings	Savings corresponding to the 569 measures associated with the participant survey	27,351 kWh
Spillover Ratio	Spillover-eligible measure savings divided by the gross program savings	0.01

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Multifamily Solutions Net-to-Gross

Table 268 presents the NTG ratio for the Multifamily Program.

Table 268. Multifamily Program - Final Net-to-Gross Ratio Calculation

Parameter	Value
Weighted Freeridership Rate	0.06
NTG Ratio Not Accounting for Spillover	0.94
Spillover	0.01
Final Net-to-Gross Ratio	0.95

Evaluated Net Savings

Net savings are the product of the *ex post* evaluated savings and the NTG ratio. Table 269 shows the *ex post* net evaluated savings for energy and Table 270 provides the *ex post* net evaluated demand reduction.

Table 269. Multifamily Program Evaluated Net Energy Savings

Measure	*Ex Post* Verified Gross Energy Savings (MWh)	*Ex Post* Net Energy Savings (MWh)	NTG Ratio
CFLs	380	363	95%
Aerators	61	59	95%
Showerheads	306	292	95%
Total	747	713	95%

Table 270. Multifamily Program Evaluated Net Demand Reduction

Measure	*Ex Post* Verified Gross Demand Reduction (kW)	*Ex Post* Net Demand Reduction (kW)	NTG Ratio
CFLs	62	59	95%
Aerators	6	6	95%
Showerheads	32	30	95%
Total	100	95	95%

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Each topic area heading has a concluding statement, followed by findings that support the concluding statement.

Program Delivery and Implementation

Staff identified one additional cost-effective program measure.

In response to 2012 recommendations, the program implementer explored two new measures for potential inclusion in the Multifamily Program offerings: ceiling insulation and air conditioning tune-ups. However, implementation staff found that in order for ceiling insulation to be cost-effective, customers

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would have to increase their existing insulation from R-1 to R-38. Because almost all multifamily buildings have insulation that exceeds R-1, the implementer did not pursue this measure.

The implementer conducted initial air conditioning tune-up training with local contractors and approved a Multifamily Tune up pilot in August, 2013. However, by the time the program forms were approved and contractor classroom training was completed, the outside temperature was not conducive for air conditioning tune-up field training. The implementer reported that air conditioning tune-up field training is expected to occur by April 15, 2014, and tune-ups will begin after the contractors are certified.

ICF improved program coverage in geographic areas throughout the state.

After the Evaluation Team identified untapped program potential in Southern Arkansas in 2012, implementation staff expanded their focus to the southern portion of the state. Staff focused on direct outreach with Property managers to increase the programs presence in Southern Arkansas . In 2013, the Multifamily Program implementation staff successfully installed measures at 11 properties in Arkansas' southeastern corner, which represented roughly 10% of all 2013 participating properties (Figure 102).

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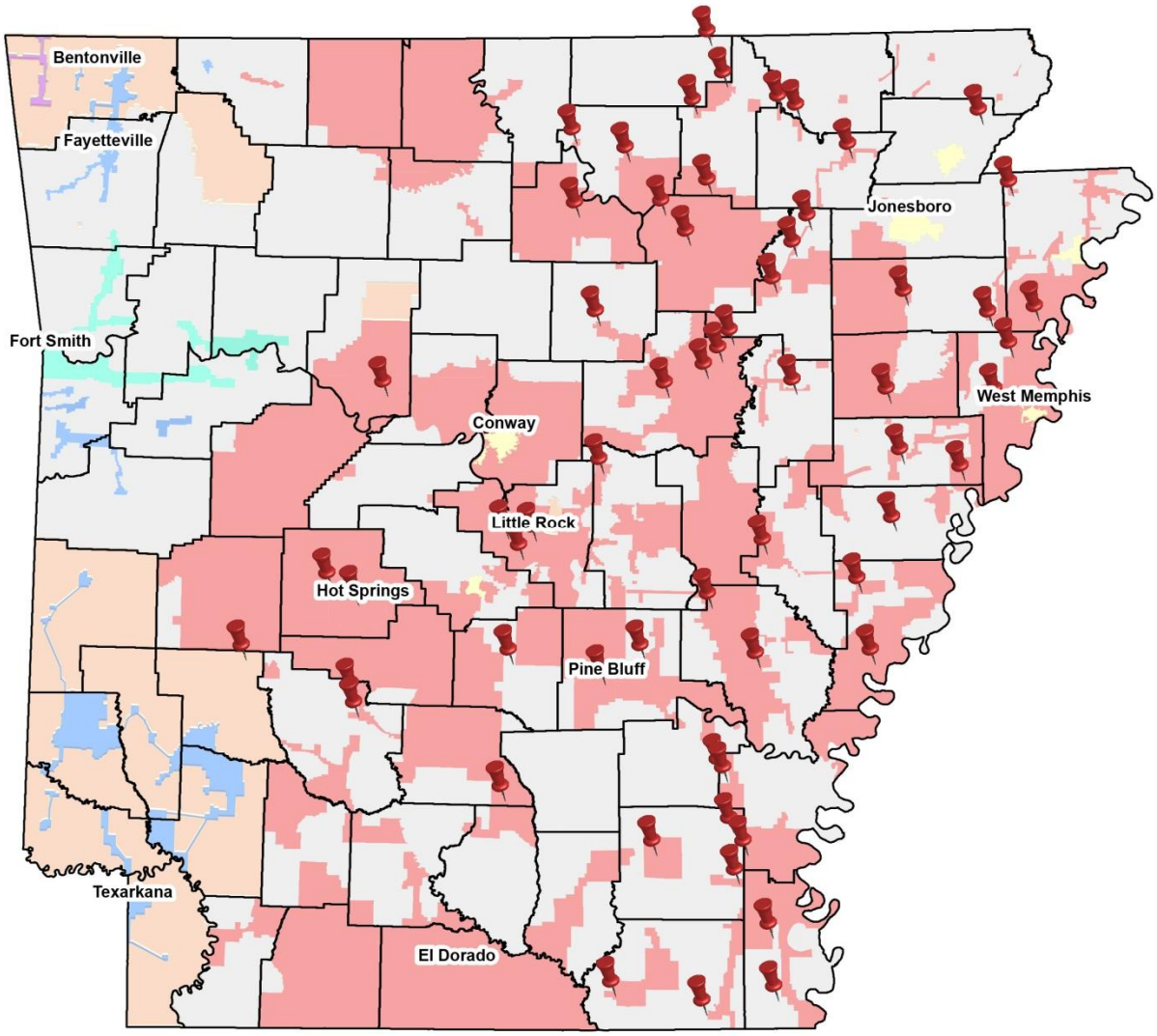
Figure 102. Distribution of Residences Served by the Multifamily Program



Source: Evaluation Team analysis of ICF PY 2013 Database Extract.

Customer Satisfaction

Participants were satisfied with the program and with EAI.

The majority of participants reported high satisfaction with the program's direct install measures (Figure 103), as well as with EAI as an electric service provider (Figure 104). While the Evaluation Team did not survey participants in 2012, we did interview building managers, 82% of whom indicated similarly high levels of satisfaction (very satisfied) with the energy saving measures available (9 of 11).

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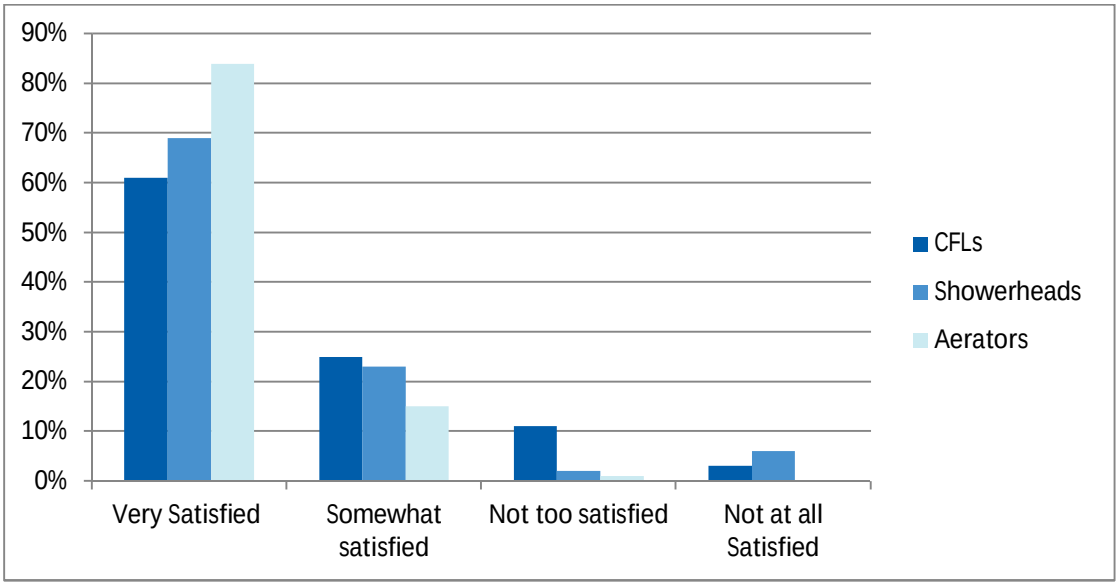
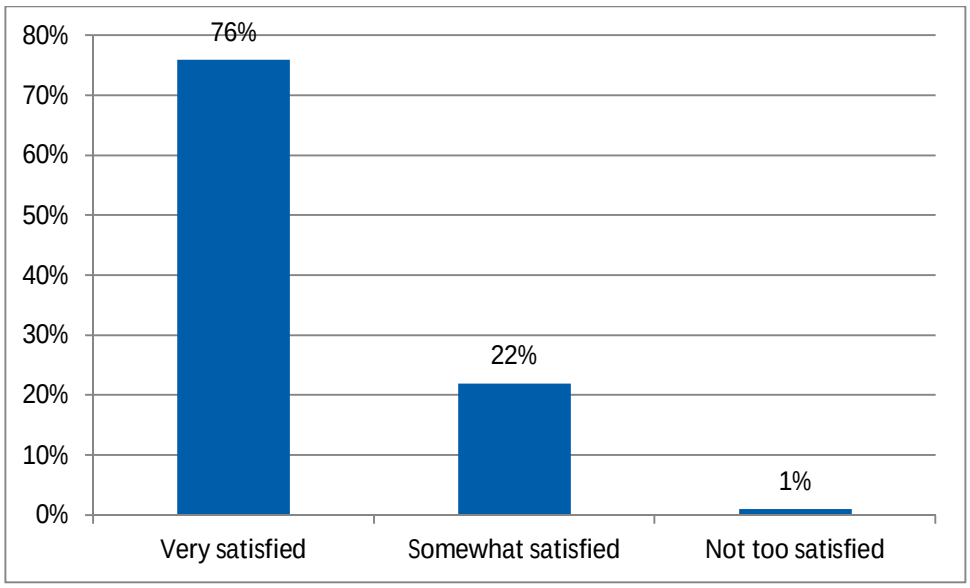
Figure 103. Satisfaction With Multifamily Program Measures



QE1-QE3. How satisfied are you with the (CFLs (n=95)/Showerhead (n=64) /Aerators (n=81)) you received from Entergy?

Figure 104. Participant Satisfaction with EAI as an Electric Service Provider



QE6. How satisfied are you with Entergy as an electric service provider? (n=103)

Program participation encouraged some customers to invest in more energy-efficiency improvements. Eight percent of the participants surveyed (8 of 103) reported installing unrebated energy-saving measures in their units after participating in the program. These measures included: CFLs, weather stripping, energy-efficient curtains, and smart power strips. Six of these eight participants said their experience with the Multifamily Program was very important to their decision to add these measures.

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Measure Verification

Site visit inspectors failed to collect installed measure verification data.

During QA/QC site visits in 2013, the program implementer made it a higher priority to verify that measures were installed correctly and in high traffic areas, and to assess customer satisfaction, than to verify installed measure quantities. . Site visits present a valuable opportunity for an independent party (i.e., not the participant) to verify that the measures recorded in the database are still installed.

Evaluation Recommendations

Recommendations for the Multifamily Program are outlined below.

Structure QA/QC site visits to collect installed measure verification data.

The Evaluation Team recommends that the implementer prioritize verifying the measures installed for the 2014 program year. Adding this step to the inspection process should not pose a significant extra burden on the inspector or customer, and the verification that the measures recorded in the database are still installed will support the evaluation process.

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Energy Solutions Rewards Program

EAI launched the three-year Energy Solutions Rewards pilot program (Rewards Program) in the fall of 2012. Through the program, EAI provides energy-efficiency education to customers and encourages behavior change through the use of home energy reports and an online informational platform. C3 Energy and ICF implement the program. C3 Energy hosts the web portal, manages web design and functionality, and distributes all electronic and direct mail communications. ICF coordinates data connectivity, program tracking, and marketing material design between C3 Energy and EAI. Given its contributions to portfolio savings, we refer to the Energy Solutions Rewards pilot as a program.

Through the program, the program implementers send reports on household-level energy use to a selected Treatment group and supplement the reports with an online platform, which gives customers more detailed information, energy-savings tips, and reward incentives. Another form of "treatment" involves active recruitment to the online Rewards Program portal for customers that do not receive the reports. This recruitment, also called acquisition activity, is delivered through bill stuffers, postcards, and emails. The implementers track customers who receive reports as well as those that receive only the acquisition materials. The way in which customers respond to the materials in either case places them in an Active or Passive status. Those that enroll in the online Rewards Program are considered Active and those that do not enroll are considered Passive (as they received materials but have not acted by enrolling online).

The program implementers targeted 100,000 individual household-level energy-savings reports to the selected Treatment group customers[169] and also sent periodic reminder postcards to this group. Customers who had closed their EAI accounts or moved were excluded from the mailings, resulting in the implementer deploying between 75,000 and 80,000 home energy reports on four occasions (quarterly) in 2013. The program implementers also used bill stuffers and emails[170] to promote the online Rewards Program to the Treatment and Acquisition Treatment groups.

Customers who enroll online receive reward points that they may apply toward a gift card from the program implementer,[171] and they continue to earn reward points by participating in energy-saving activities that result in year-over-year energy savings for a given month. Reward points are redeemable at local and online retailers. The Rewards Program landing page also offers general information about saving energy to all visitors and encourages customers to set up an online account to track their household energy use.

To facilitate savings measurement in 2012, C3 Energy identified a Control group of 130,000 customers; these customers received neither reports or recruitment materials. Although Control group customers

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169 Home Energy Reports are only sent to users in the treatment group who have not signed-up for the online program. No customer response is required to be considered a participant in the Treatment group.

170 Approximately 30% of users in the Acquisition Treatment Group had valid email addresses.

171 Enrollment offer gift cards are redeemable at Wal-Mart, Amazon.com, and other retailers.

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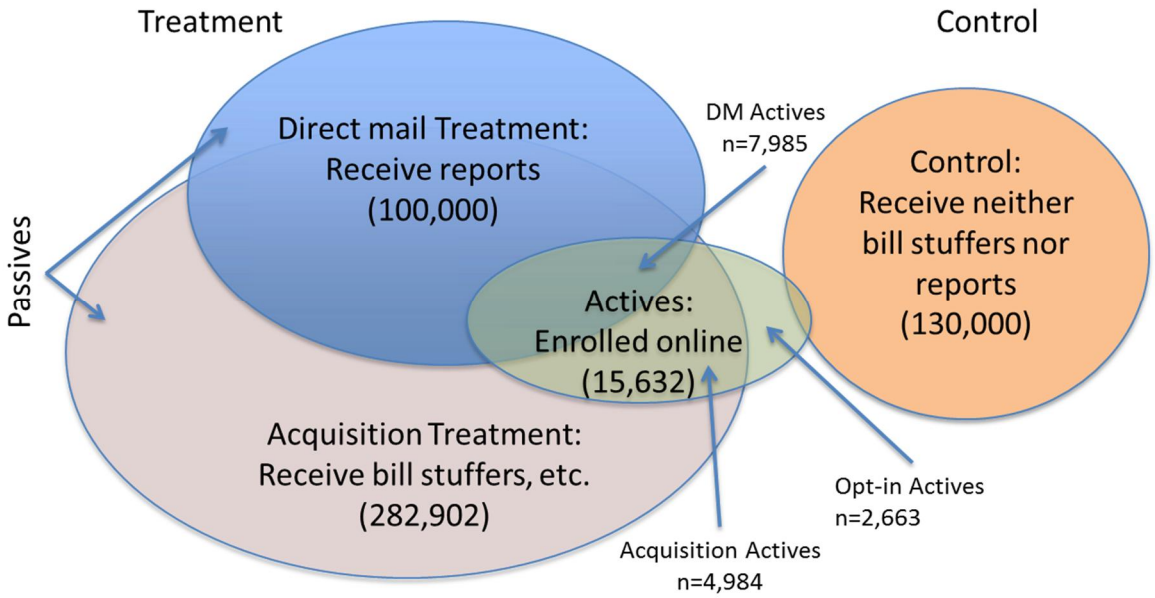
did not receive any direct promotions for the Rewards Program, a small number could have been exposed by self-initiative on the EAI website, or through word-of-mouth or a news story. The program implementers tracked customer movement from Control and/or Passive to those with Active status.

Program participation categories include:

- *Direct Mail Actives.* Customers in the Treatment group who receive a direct mail report about enrolling online, and who subsequently enrolled in the program.
- *Acquisition Actives.* Online enrolled customers who received a bill stuffer or postcard promoting the online program and enrolled in the online Rewards Program.[172]
- *Opt-In Actives.* Online enrolled customers who found out about the Rewards Program independent of any treatment. They could be from the Control group or from the remaining customer population.
- *Passives.* Customers who received direct mail or recruitment materials but did not enroll in the program (Figure 105).
- *Control.* Both the direct mail treatment group and the acquisition treatment group were randomly selected from a larger sample, part of which was set aside as a control group. Thus, 50,000 customers were set aside as a control group for the direct mail treatment and 80,000 customers were set aside as a control group for the acquisition treatment, for a total control group of 130,000 customers.

Figure 105. Participation Categories/Program Design



* DM stands for direct mail.

[172] Customers did not receive a report, but were recruited directly to join the online Rewards Program.

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EAI measures program savings by comparing Treatment group changes in energy use to Control group changes in energy use. This experimental design approach assumes that customers from both the Treatment and Control groups are exposed to the same conditions that affect energy use, with the reports, acquisition activities, and online Rewards experience as the differentiating program effect on energy-saving behaviors. Methods for determining savings are outlined in both the Arkansas TRM and in a supplemental protocol developed for this pilot, known as Protocol J.[173]

Program Status Overview

The Rewards Program achieved 148% of its energy-savings goal, and 294% of its demand reduction target. Although only approximately 75% to 80% of target participants received home energy reports, the Direct Mail Treatment group, Acquisition Treatment group, and Opt-in customers combined represented a total of 382,902 participants, or 385% of EAI's participation goal (Table 271).

Table 271. Rewards Program Goals vs. Actual*

	Projected/Goal	2013 Actual	Percent of Goal Achieved
Energy Savings (MWh)*	6,328	10,177	161%
Demand Savings (MW)*	2.17	6.92	318%
Participation (customers/units)**	100,000	385,268	385%
Budget	$1,487,462	$1,510,930	102%

* These values represent evaluated net savings and reflect the application of a 8.49% line loss factor.
** Actual participants represent the maximum number of EAI customers who received any type of program treatment plus those who did not receive a treatment but opted in to the program.

In addition to implementing the Rewards Program marketing and operational plans, the implementers focused on two major efforts in 2013:

1. Resolving technical and privacy policy challenges around connecting the C3 Energy portal to EAI customer accounts.
2. Implementing website enhancements through a redesign.

These challenges and enhancements, while ultimately improving the online participation experience, resulted in delayed promoting and recruiting for the program's online component.

[173] Arkansas Public Service Commission. "Arkansas TRM: Protocol J: Behavior-Based Program Evaluation Protocol." 2012.

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Two factors contributed to this online engagement shortfall:

3. *Initial problems with verifying account numbers.* Some customers had trouble finding their account number and others experienced errors when they attempted to enroll online. EAI and implementer IT staff addressed the problem within the second quarter of 2013.
4. *Delayed recruitment efforts.* In the first half of the year, C3 Energy staff focused on redesigning the website to enhance functionality, improve navigation, and clarify content. Although they deployed some recruitment materials within the first six months, C3 Energy increased acquisition activities after completing the redesign to ensure that new enrollees had access to the improved online resources. Because the website redesign was not completed until August 2013, there were only four months to acquire the anticipated volume of new enrollees.

Despite the time CS spent focused on addressing IT issues and enhancing the website, the program achieved 9,884 new Active participants in 2013.

Status of 2012 Evaluation Recommendations

Table 272 lists the status of each of the Rewards Program recommendations reported in the 2012 *Energy-Efficiency Portfolio Evaluation Report.* Program staff completed most of the 2012 recommendations during the 2013 program year.

Table 272. 2013 Status of 2012 Rewards Program Recommendations

2012 Recommendation	2013 Status
Continue implementing the pilot as planned through 2013 and evaluate savings after 12 full months of post-treatment implementation.	*Completed.* Implementers continued the pilot through 2013.
Develop a QA/QC plan for the Rewards Program.	*Completed.* Implementers developed a QC plan for the program, outlining key quality metrics.
Continue to use direct mail to recruit participants in the online engaged groups.	*Completed.* Implementation staff sent four home energy reports, two bill stuffers, and two postcards during 2013.
Use cross-promotional opportunities to engage participants in energy-saving home improvements.	*Completed (Considered/Rejected).* Program staff considered this but elected not to conduct cross-promotional marketing until savings can be disaggregated from other programs.
Develop a marketing metrics plan to provide consistent reporting and real-time tracking to enable effective adjustments in program marketing tactics.	*Completed.* Implementation staff developed a marketing schedule and reported outcomes monthly, and adjusted the timing of their outreach based on tracking and other activities.
Track metrics such as frequency and reach, awareness levels, and conversion source for each marketing channel.	*Completed.* Implementation staff tracks frequency, reach, and conversions. In addition, staff tracks awareness through process evaluation surveys.
Consider conducting a web survey with participants who enrolled online to assess what information	*Completed.* Evaluation staff launched an online survey in December 2013, hosted on the Rewards website.

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2012 Recommendation	2013 Status
customers want or expect from the website.	
Look for opportunities to promote the program through earned media wherever possible.	*Completed.* Implementation staff promoted the program on a TV morning news program, as well as on television and radio ads launched in the third quarter.
Continue to raise awareness for how energy savings could apply to customers' specific needs and challenges.	*Completed.* Implementation staff redesigned the home energy reports to increase engagement in energy-saving activities and to improve user recall of the report content.
Consider design and messaging enhancements to make the reports more memorable.	
Consider incorporating messaging that provides new or unfamiliar ways to save energy and lists types of improvements that could yield noticeable bill reductions.	*Completed.* Implementation staff developed energy-saving tips based on actions that yield the greatest savings in terms of kWh and/or bill reductions. Staff expanded the energy-saving tip library to incorporate unique messages and new ways to save energy.
Continue using recruitment messaging that promotes bill savings and consider additional messaging to address customers' barriers to saving energy.	*Completed.* Implementation staff developed recruiting messages around three distinct benefits: (1) save money on your bill; (2) save energy/help the environment; (3) earn rewards. In addition, staff developed energy-saving tips that focus on no-cost or low-cost solutions.
Consider developing a program icon or brand for later memory recall.	*Completed (Considered/Rejected).* Staff use a consistent color scheme and look/feel on the marketing materials and in all Rewards communications, but chose not to develop a logo/icon for the program.
Consider new or additional options for message placement, for example, on the outside of the envelope, to provide additional visual cues for future recall.	*In Progress/Partial.* Implementation staff plan to create envelopes with program-specific taglines for future direct mailers.
In the Rewards website/Learn page, clearly explain that incentives are available for the improvements described in the energy-saving tips and provide online links to the relevant programs.	*Completed.* Implementation staff reworked the incentive language on the program website, the Residential 2.0 portal.
Include references to other programs wherever corresponding energy-saving tips are provided.	*Completed (Considered/Rejected).* Program staff considered cross-promotion but are reluctant to directly promote or link the Rewards Program to other programs unless savings can be disaggregated and attributed to the Rewards Program.
Continue providing reports in the current format, for which respondents are satisfied, and include fresh, specific, and applicable content.	*Completed.* Implementation staff revamped the home energy reports format to be cleaner, easier to understand, more straightforward, and to ensure that the tips are personalized and energy/dollar savings are based on the user's individual energy use.
Explore increasing the report delivery frequency to a	*Completed.* Implementation staff sent out direct mail

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2012 Recommendation	2013 Status
monthly basis, possibly focusing initially on Active participants.	reports quarterly in 2013 to non-enrolled users, as well as sending two email communications each month to Active users: (1) a Bill Feedback email that summarized monthly energy savings and rewards points earned; and (2) an Energy Saving Tip email that provided a monthly energy-saving tip for residential users. In addition, staff sent postcard and emails during the third and fourth quarters to drive customers to the portal.
Continue to monitor participation in the types of behavior the program is designed to influence, differences in awareness and behavior between groups, and attribution.	*Completed.* Implementation staff monitored the online portal to ensure it captured self-reported actions from online users and to quantify the actions users took after signing up.
Consider using testimony, segmentation, and success stories in direct mail or online materials that enable the readers to relate to similar households and better visualize ways to achieve energy savings in their own homes.	*In Progress/Partial.* Implementation staff considered marketing approaches such as using testimony and success stories. Although not executed in 2013, C3 Energy may use these approaches in future marketing materials.

Analysis Methodology

For the Rewards Program 2013 evaluation, the Evaluation Team conducted the following data collection and analysis activities.[174]

- Data Collection Interviews[175]
  - Utility Program Manager (n=1)
  - Implementation Program Managers (n=2)
- Year End Interview
  - Utility Program Manager (n=1)
- Participant Surveys (n=280)
- Online Surveys (n=23)
- Billing Analysis/Regression Modeling, focusing on pre-treatment (January-December 2012) and post- treatment (January-December 2013) months (methodology details are provided below)
- Materials and Marketing Review

The Evaluation Methodology section of this report provides detailed descriptions of these data collection and analysis activities.

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[174] The Evaluation Team conducted a full process evaluation of the Rewards Program.

[175] These interviews occurred in-person in May 2013.

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The participant survey focused on four groups:

- *DM Treatment Actives* (n=70): Received direct mail reports and enrolled online
- *DM Treatment Passives* (n=70): Received direct mail reports but did not enroll online
- *Opt-in Actives* (n=70): Enrolled online and may have come from the Acquisition Treatment group, the Control group, or from the remaining non-defined EAI customer population
- *Control* (n=70): Members of a designated Control group for either the reports or acquisition activities. These are considered a single group that, by design, receives neither direct mail reports nor acquisition activities.

The findings do not always distinguish between DM Treatment Actives and Opt-in Actives. Findings that refer to Actives refer to both DM treatment and opt-in active types and include all of those that enrolled in the online Rewards Program. References to Passives in the survey findings are only including those that received direct mail reports but did not enroll online. The survey did not include those that received acquisition activities but did not enroll online.

The Evaluation Team used branching and skips in the survey design to direct certain questions to the appropriate participation group(s). For example, Opt-in Actives and Control respondents did not receive any questions about the reports, as they did not receive reports.

Impacts Summary

The Rewards Program achieved 161% of its 6,328 MWh energy-savings goal based on a net evaluated energy savings of 10,177 MWh after adjusting for line losses, as shown in Table 273. By applying the CF calculated from a calendar year 2021 HES Program load shape provided by EAI, the Team estimated a net reduction in peak coincidence demand of 6.92 MW after adjusting for line losses. The program thus achieved 319% of its 2.17 MW goal, as shown in Table 274.

Table 273. Rewards Program *Ex Post* Net MWh Savings and Program MWh Savings Goal

Energy Savings Goal (MWh)*	Net Evaluated Energy Savings (MWh)	Percent of Goal Achieved
6,328	10,177	161%

* The evaluated net MWh value includes a line loss adjustment factor of 1.0849.

Table 274. Rewards Program Ex Post Net MW Savings and Program MW Savings Goal

Program Savings Goal (MW)	Gross *Ex Post* Verified Savings (MW)	Percent of Goal Achieved
2.17	6.92	319%

* The evaluated net MW value includes a line loss adjustment factor of 1.0849.

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Review of TRM Values

Although individual measures with deemed savings were available in the Arkansas TRM 3.0, the TRM did not address this program specifically nor the savings associated with behavioral actions. C3 Energy compiled a list of measures that could be attributed to the savings tips provided through this program. We determined savings for the program overall through an alternative billing analysis approach as explained in the 2013 EM&V Plan. The Evaluation Team did not review TRM 3.0 savings values for this program.

Impact Evaluation Method

The Evaluation Team used billing analysis to assess the net per-unit savings generated by participation in the Rewards Program. We specified a fixed-effects CSA regression model with paired pre- and post-treatment months to estimate electricity savings from the program.

Data Sources

We used the following data to inform the impact evaluation:

- *Customer Data.* We flagged this data for each customer who was in the DM treatment group, the acquisition treatment group, and/or who signed up online. We placed customers who signed up online in the Active group and customers who received stuffers and/or mailers but who did not sign up online in the Passive group. We conducted a separate analysis for customers in the Opt-in group, who received neither stuffers nor mailers. The Direct Mail and Acquisition Treatment groups each had a separate control group.
- *Other Program Participation Data.* To avoid double-counting savings from measures that were rebated by other EAI programs, we measured the participation rates between the Treatment (Active and Passive) groups and the Control group to determine if there were any differences between other-program (i.e., CoolSaver, HES, Manufactured Homes, Lighting and Appliances, and Multifamily Homes) participation rates and other-program savings per participant. Since these rates were the same, the savings estimated using the model were net of other EAI program savings.
- *Billing Data.* For the billing analysis, we used participants' energy consumption records from August 2011 through December 2013.
- *Weather Data.* The Evaluation Team collected daily weather data from the National Climatic Data Center for 20 weather stations in Arkansas, Louisiana, Missouri, Oklahoma, and Tennessee to account for weather impacts in our billing analysis. For each station, we calculated the daily base 65 HDDs and CDDs. We matched each billing data period for the associated HDDs and CDDs to the nearest weather station by ZIP code.

Treatment Group

For the impact analysis, the Evaluation Team used the Treatment groups (Passive and Active) of participants. Of 80,000 to 100,000 customers who received mailers—the number receiving mailers declined over time due to attrition--7,985 became active participants by enrolling online; of 282,902

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customers who received bill stuffers, 4,984 became active by enrolling online. An additional 2,366 customers opted into the program without having received a mailer or a stuffer. Thus we analyzed a total of 15,632 active and 92,015 passive treatments.

The billing analysis specifically required one year of pre-treatment billing data and one year of post-treatment billing data for all Treatment group participants.

Control Group

The program implementer identified a Control group for each of the two treatment groups, in order to account for macroeconomic factors and other program participation that might have impacted energy consumption between the pre- and post-treatment periods.[176] The Control groups did not receive program-specific bill inserts or mailers and did not sign up online. The Evaluation Team analyzed a control group of 50,000 customer accounts paired with the DM treatment and a control group of 80,000 customer accounts paired with the acquisition treatment; neither Control group activated their online account.

Analysis Period

For the billing analysis, the Evaluation Team focused on changes in participants' energy consumption between the one year prior to their first engagement online (the pre-treatment period) and the one year period after their first online engagement (the post-treatment period). We paired the pre- and post-treatment months from each year.

Figure 106 plots the average daily pre-treatment period electricity use for the final modeled sites. The graph shows that the customers who received mailers used slightly more electricity during the pre-treatment period than customers who received bill stuffers. Plots of the control groups are, as designed, exactly the same as the treatment groups; hence, in the figure they are not visible behind the treatment group plots.

[176] The Evaluation Team found that, in general, the Control group also reduced energy consumption. If the other program participation rates and measures installed are similar between the Control group and the Treatment groups, then we expect that the model savings have accounted for this difference in energy consumption.

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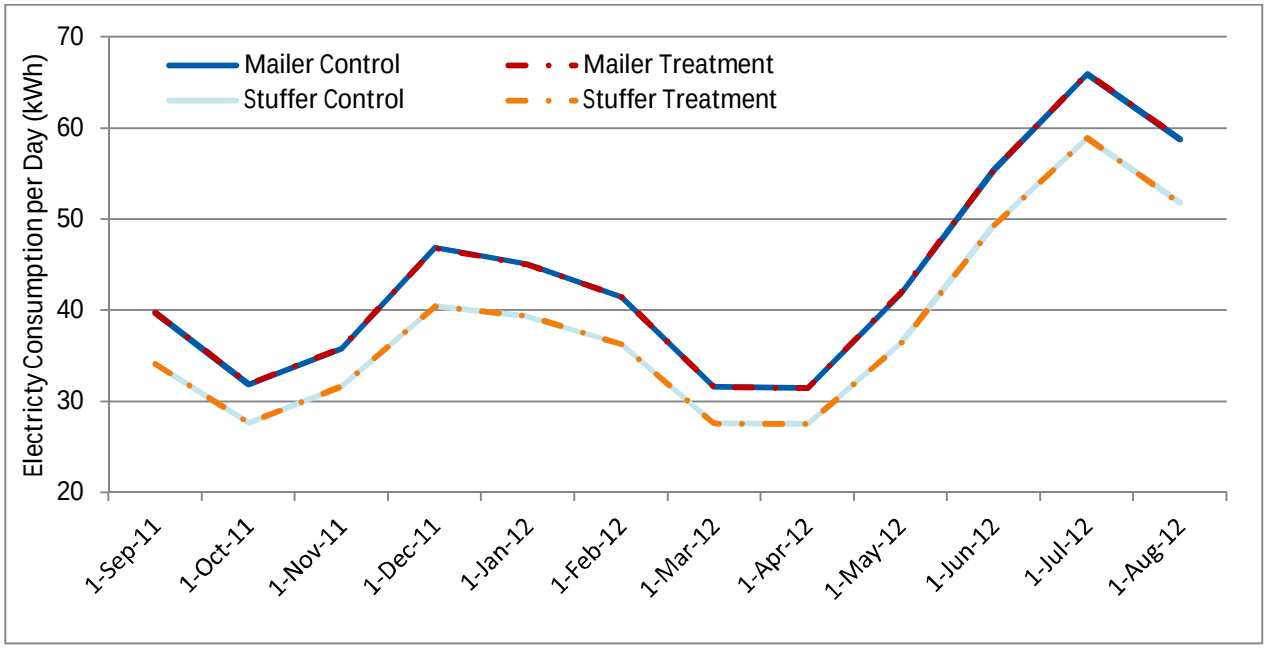
Figure 106. Pre-Treatment Electric Usage Factors



For the mailer Control and Treatment groups, the average usage minimum is around 31 kWh per day, while the maximum in the summer months is around 66 kWh per day. For the acquisition (i.e. stuffer) Control and Treatment groups, the average usage minimum is around 27 kWh per day, while the maximum in the summer months is around 58 kWh per day. Customers used much less electricity during the months from October to December and March to May, when most consumption is baseload, than they did in the rest of the year.

Billing Analysis Approach

The Evaluation Team employed a fixed-effects CSA modeling approach to obtain the model savings. Initially, we screened data for missing or incomplete values.

Billing Data Screening

To ensure only the highest quality data were included in the analysis, we excluded any customers whose data met the following criteria:

- Less than 20 days or more than 40 days in any monthly billing cycle.
- Less than 11 months in either the pre-treatment or post-treatment period.

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After screening for these criteria, we excluded customers from the analysis at the rates shown below for the three analysis groups.

Table 275. Analysis Group Populations

Analysis Group	Model Analysis n=	Analysis Population n=	% Excluded from Analysis Population
Mailer Control Group	49,549	50,000	1%
Mailer Treatment Group	99,276	100,000	1%
Acquisition Control Group	72,712	80,000	9%
Acquisition Treatment Group	258,292	282,902,	9%

The rates of customers we excluded from the analysis population varied from 1% to 9%. The majority of the customers were excluded due to lack of pre- and post-treatment billing data or billing cycles that were too long or too short.

Model Specification and Estimation

The Evaluation Team performed a CSA fixed-effects model for each of the four pre-treatment period quartiles for both the Active and Passive Treatment groups. The fixed-effects model estimations included both the Treatment group and the matched Control group. The Team included a separate intercept for each customer in the fixed-effects specification to normalize for usage differences between customers and to control for usage differences between the Treatment and Control groups.

To obtain model savings, the Evaluation Team used the following fixed-effects model specification:

$$ADC_{it} = \alpha_i + \beta_1 * HDD_{it} + \beta_2 * CDD_{it} + \beta_3 * POST_{it} + \beta_4 * PART_i * HDD_{it} + \beta_5 * PART_i * CDD_{it} + \beta_6 * PART_i * POST_{it} + \varepsilon_{it}$$

Where, for customer 'i' and billing month 't':

ADC_{it}	=	The average daily kWh consumption in the pre- and post-treatment period
α_i	=	A separate intercept for each customer, part of the fixed-effects specification
β_1	=	The average usage per HDD for nonparticipants
HDD_{it}	=	The average daily base-65 HDD for the nearest weather station based on location
β_2	=	The average usage per CDD for nonparticipants
CDD_{it}	=	The average daily base-65 CDD for the nearest weather station based on location
β_3	=	Change in usage per day for the Control group

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$POST_{it}$	=	A flag that is 1 for the September 2012 to August 2013 post-treatment period months, and 0 for the September 2011 to August 2012 pre-treatment months
β_4	=	The incremental average usage per HDD for Active or Passive participants
$PART_i$	=	A participation flag that is 1 for the Passive or Active participants, and 0 for the Control group
$PART_i * HDD_{it}$	=	An interaction between the participation flag ($PART_i$) and average daily HDD
β_5	=	The incremental average usage per CDD for Active or Passive participants
$PART_i * CDD_{it}$	=	An interaction between the participation flag ($PART_i$) and average daily CDD
β_6	=	The savings per day for participants
$PART_i * POST_{it}$	=	An interaction between the participation flag and the post-treatment period flag
ε_{it}	=	The model error term

We estimated two models: one each for the mailer customers and one for the acquisition customers.

Impact Findings

Table 276 shows that 2013 savings for customers who received mailers were 11.62 kWh (± 186%) or 0.07% of the pre-treatment period usage. For customers who received bill stuffers, the 2013 savings were 29.05 kWh (± 51%) or 0.23% of the pre-treatment period usage. Since the Treatment and Control groups have the same rates of participation in other EAI programs and the same other-program savings per participant, we consider these savings to be net of and adjusted for other EAI program participation. Demand reductions were estimated by applying a coincidence factor to the energy savings, representing the average percentage of annual consumption during a peak period hour (CF = 0.000679537).

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Table 276. Net Savings and Participant for Customers Receiving Mailers and Bill Stuffers

Type of Customer	Activated On-Line	Participation (# homes)	Net Energy Savings (MWh)	Net Energy Savings Per Customer (kWh)	Relative Precision of Energy Savings	Net Demand Savings (MW)
Received Mailers	Total	80,000 to 100,000	1,162	11.62	186%	0.79
	Activated	7,985	618	77.38		0.42
Received Stuffers	Total	282,902	8,218	29.05	51%	5.58
	Activated	4,984	450	90.25		0.31
Opt-In	Activated	2,366	-154	-57.96		-0.10
Total		382,902	9,380	24.50	50%	6.37

The Rewards Program did not have *ex ante* savings in 2013, and thus customers who received mailers and bill stuffers all achieved a realization rate of 100%.

Net-to-Gross Analysis

The Team's billing analysis approach estimates net program effects through the Control group comparison. There is, in effect, no distinct gross savings value, and no additional NTG analysis was necessary.

Program Savings Persistence

Protocol J requires EAI to maintain a Control group for every year in which program impacts are evaluated and every few years after the program has been running for several years. The program design continues to include a Control group to enable savings observations over time. The first cursory observation of savings persisting is evident in the fact that energy savings continue to outpace goals. The treatment appears to be having the desired effect of encouraging behavior changes that result in energy savings in aggregate.

Evaluation Findings and Conclusions

The following sections present the evaluation findings. Under each topic area heading, we present a concluding statement, followed by findings that support the concluding statement.

Program Delivery and Implementation

The 2013 online portal redesign provided an inviting customer entry point.

In executing the website redesign, the implementers considered and included many of the recommendations provided in the 2012 *Energy-Efficiency Portfolio Evaluation Report*. A review of the

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screenshots provided by the program implementer indicated the redesigned website not only displays a refreshed look and feel (including cloud imagery and a pledge banner), but also includes many user-friendly enhancements:

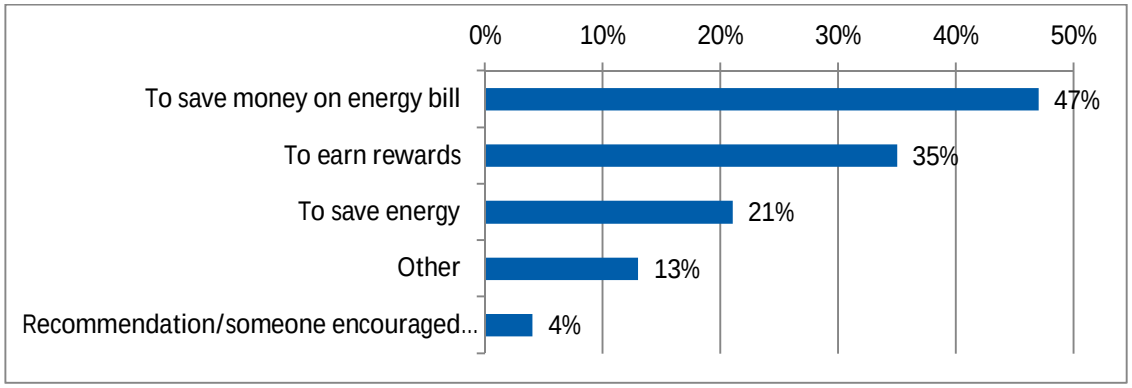
- Re-designed landing page inviting customer to pledge to save up to $250 annually.
- Functionality to log in via Facebook, recommend the program to friends, share the pledge, and compare energy use to friends'.
- Customized savings plans and real-time reports including monthly energy spending and disaggregated usage characteristics, such as energy used for space heating, water heating, cooling, and appliances based on inputs from the customer.
- Measure-specific ways to save that include estimated costs/savings figures, payback, benefits of implementing measures, and steps to complete an upgrade.
- Rewards page incorporating reward company logos, engaging imagery, and easy-to-use instructions and links to access immediate reward redemption.
- Online access to engaging and user-friendly personalized home energy reports.

In addition to the user-friendly design, the updated portal also includes appealing and relevant imagery paired with actionable and easy-to-follow program participation steps. The supplemental connection to social media encourages customers to engage with the utility and share their experience with their online community, which deepens customer engagement and solidifies their behavioral energy-saving pledges.

A desire to save money drives Actives to participate, while a lack of time and interest are enrollment barriers for Passives.

Most Actives who enrolled online reported that saving money (47%) was their primary motivation for engaging with the program. However, nearly one-third of Actives (35%) mentioned earning rewards as a key motivation (Figure 107).

Figure 107. Actives' Motivations for Enrolling Online*



QC4. What motivated your decision to register for the Rewards Program? (n=135; multiple responses allowed)

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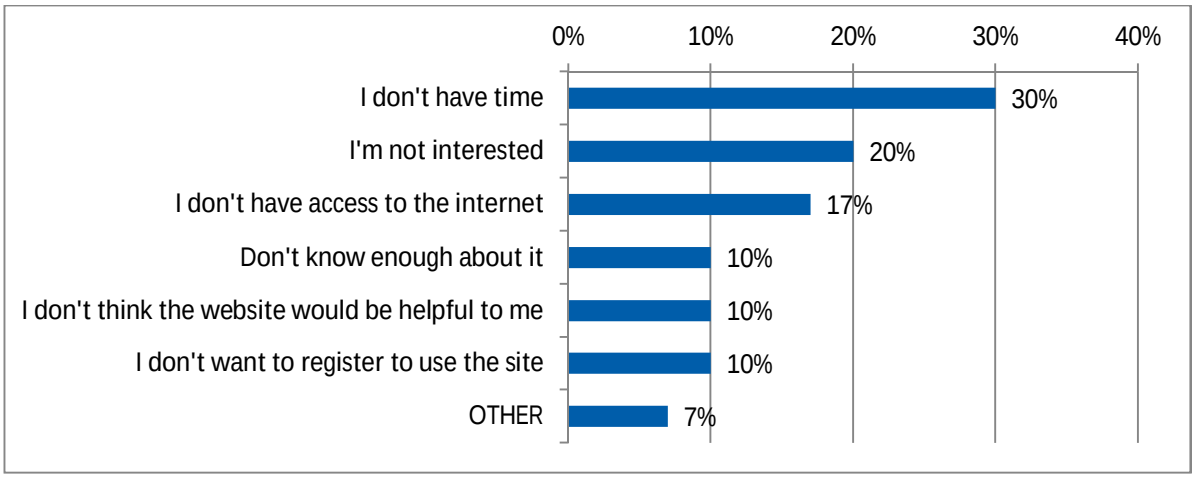
While Actives were motivated to participate by a desire to save money and earn rewards, Passive participants cited a lack of time (30%) and disinterest (20%) as their top reasons for not enrolling the program (Error! Reference source not found.).

Figure 108. Passives' Reasons for Not Enrolling



QF3. Can you say more about why you have not enrolled in the online Rewards Program? (n=30; multiple responses accepted)

Having no challenges to saving energy may be customers' primary barrier to further Rewards Program engagement.

As shown in Figure 109, over one-third of all respondents (35%) said they faced no challenges to saving energy. However, having no challenges to saving energy can be interpreted differently, potentially reflecting low or high engagement. Those more highly engaged may have already addressed challenges and made significant improvements to their home, while those less engaged may simply not recognize the opportunities for saving more, which may keep them from saving energy in their home.

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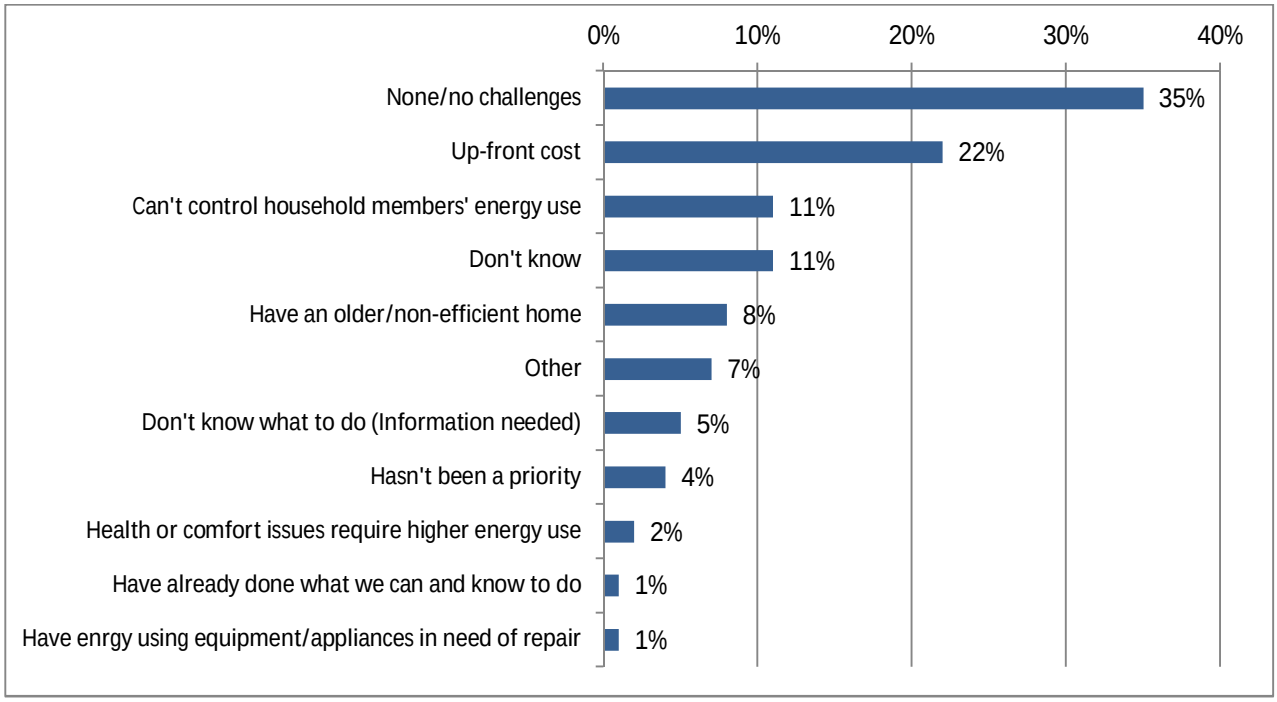
Figure 109. Challenges to Saving Energy



QH2. What challenges do you face in saving energy in your home? (n=276; multiple responses allowed)

Marketing and Outreach

A diverse marketing strategy encouraged participants to actively engage online.

In addition to the website redesign and optimization, implementation staff launched a multichannel marketing campaign, which included direct mail, bill inserts, energy reports, energy-saving tip emails, web banners, and engagement through social media channels. All of these marketing tactics consistently reflected the website's updated look, feel, and messaging, which was designed to educate and motivate customers. Table 277 details the program implementers' 2013 marketing tactics and the frequency of each.

Table 277. 2013 Treatment Channel Marketing

Tactic	Recipients	Number
Home Energy Reports	Direct Mail Treatment	4 (quarterly)
Energy-Saving Tip Email	Actives	10
Bill Insert	Acquisition Treatment and DM Treatment	2
Acquisition Postcard/Direct Mail	Direct Mail Treatment	2
Acquisition Email[177]	Acquisition Treatment	10
Web Banner/New Landing Page	Anyone	1

[177] Only approximately 30% of users in the Acquisition Treatment group had valid email addresses.

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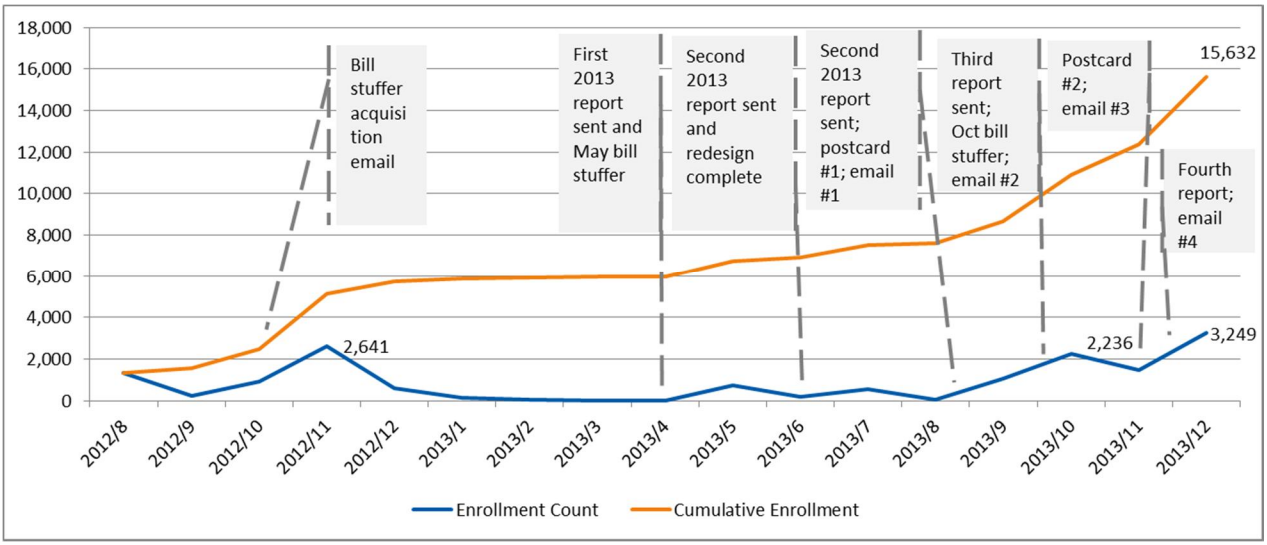
The implementers also reported using these diverse marketing tactics to consistently encourage customers to participate in the program's online rewards component. After resolving the technical issues and completing the website redesign in August 2013, staff successfully shifted their focus to online Rewards Program recruitment (see Figure 110). As a result, online enrollment increased in the fourth quarter.

Figure 110. Online Enrollments with Outreach Activities



Source: 2013 program tracking database

These efforts appear to have had a positive influence on customers' online participation, as the energy-saving tip emails experienced above-average open rates (average of 27.7%) and click-thru rates (7.8%).

Active participants were more aware of EAI's programs and took more energy-saving actions in their homes.

Customers who more actively engaged with the program have significantly higher awareness of EAI's energy-efficiency programs. In surveys, 59% of Actives recalled receiving energy-saving information from EAI, compared to 40% of Passives. Additionally, the rate of recall among Treatment group respondents (Actives and Passives combined) was significantly higher than among Control group respondents, at 39% compared to 14%, respectively. Within the Treatment group, more Actives (49%) than Passives (37%) were aware of programs. Interestingly, Opt-In Actives had the highest awareness for EAI programs (56%), but they did not receive the direct mail reports and the Rewards Program implementers and marketing materials did not directly cross-promote other programs. See Figure 111 for more details.

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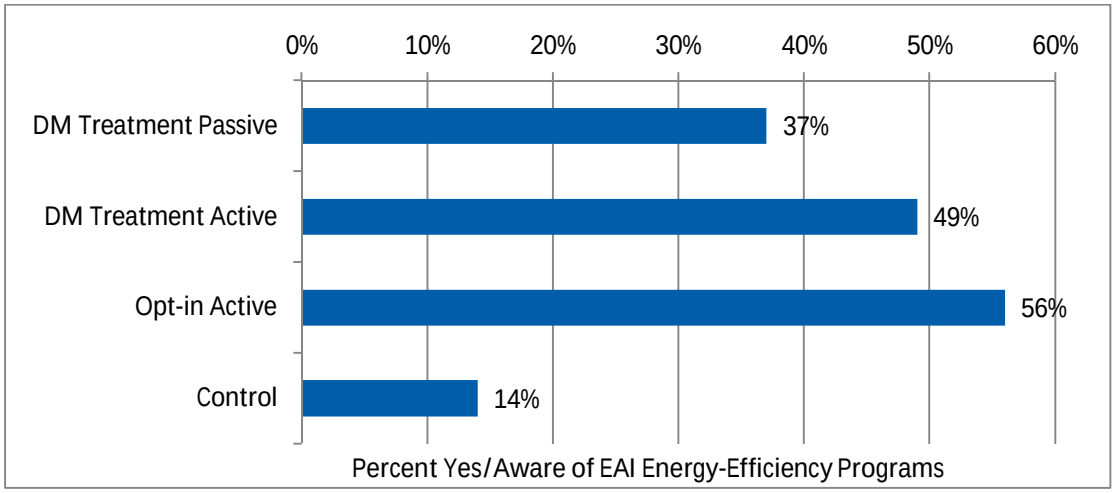
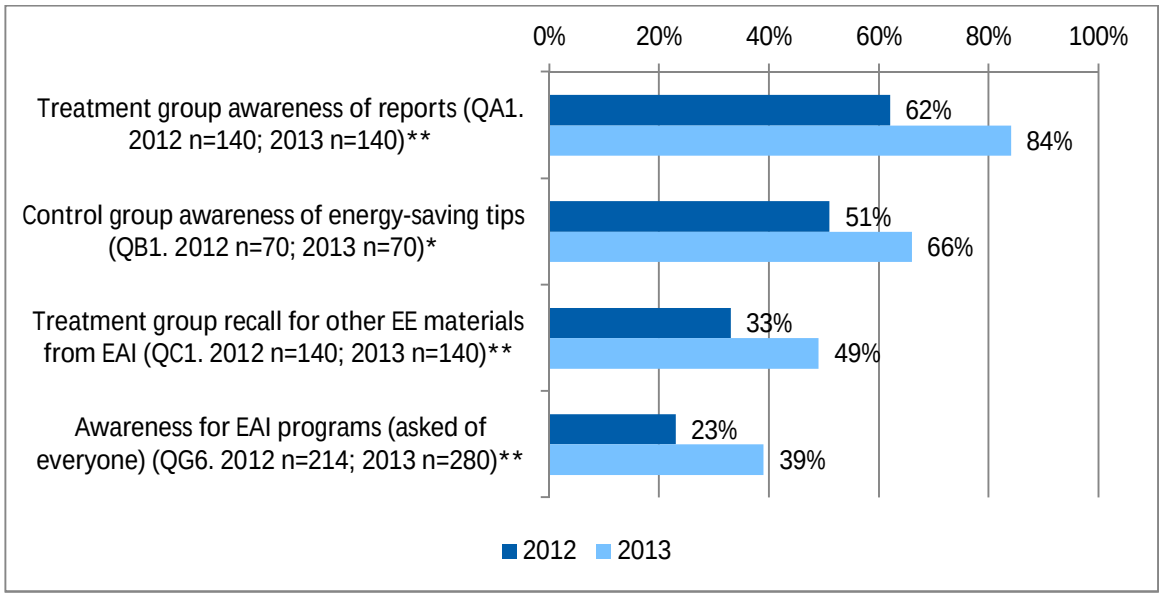
Figure 111. Awareness of EAI Energy-Efficiency Programs



QG6. Are you familiar with energy-efficiency rebates or programs from Entergy to help you make energy-saving improvements to your home? (n=280)

In a comparison of 2012 to 2013 survey results, respondents indicated significant gains in the key awareness areas listed in Figure 112.

Figure 112. Comparison of 2012-2013 Participant Responses



QA1, QB1, QC1, and QG6.

* This result is significant at the 90/10 confidence level

** This result is significant at the 95/5 confidence level

In addition, 2013 respondents also showed gains over 2012 in energy-saving actions (see Figure 113).

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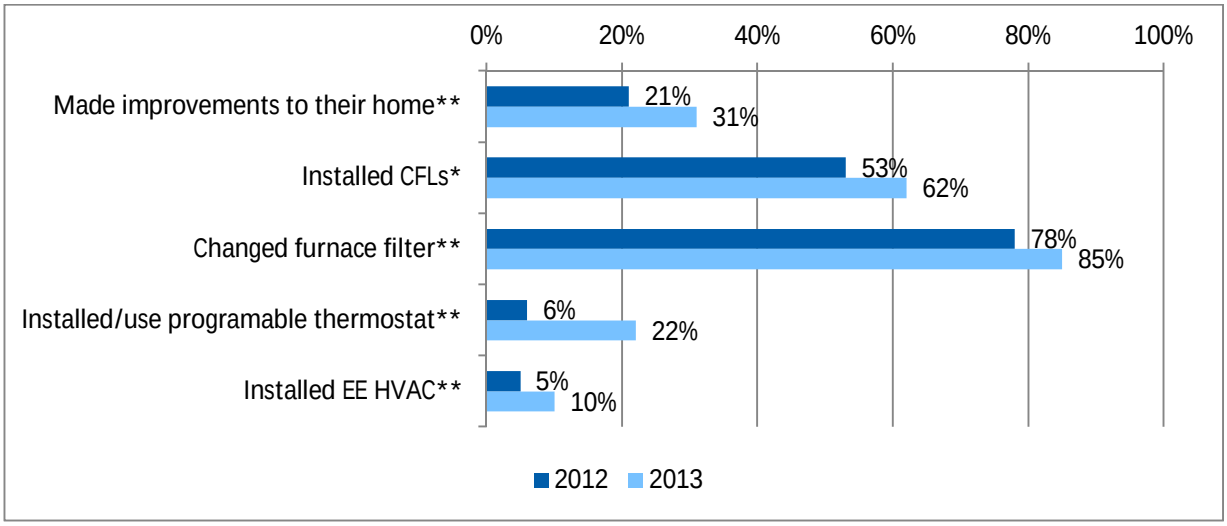
Figure 113. Comparison of 2012-2013 Treatment Group Actions Taken



QG10. Now I will list a few common home energy-efficiency improvements and I will ask if you have done any of them in your home since January. (2012 n=214; 2013 n=277)

* This result is significant at the 90/10 confidence level

** This result is significant at the 95/5 confidence level

Nearly three-quarters of Actives (74%) took an average of five energy-saving actions in their home during 2013. Unprompted, respondents most often mentioned replacing light bulbs with CFLs or LEDs (39%; Figure 114). However, when prompted with specific energy-saving activities, respondents reported turning off lights in unoccupied rooms (22%) and lowering the heating temperature (19%) as their top two actions (Figure 115).

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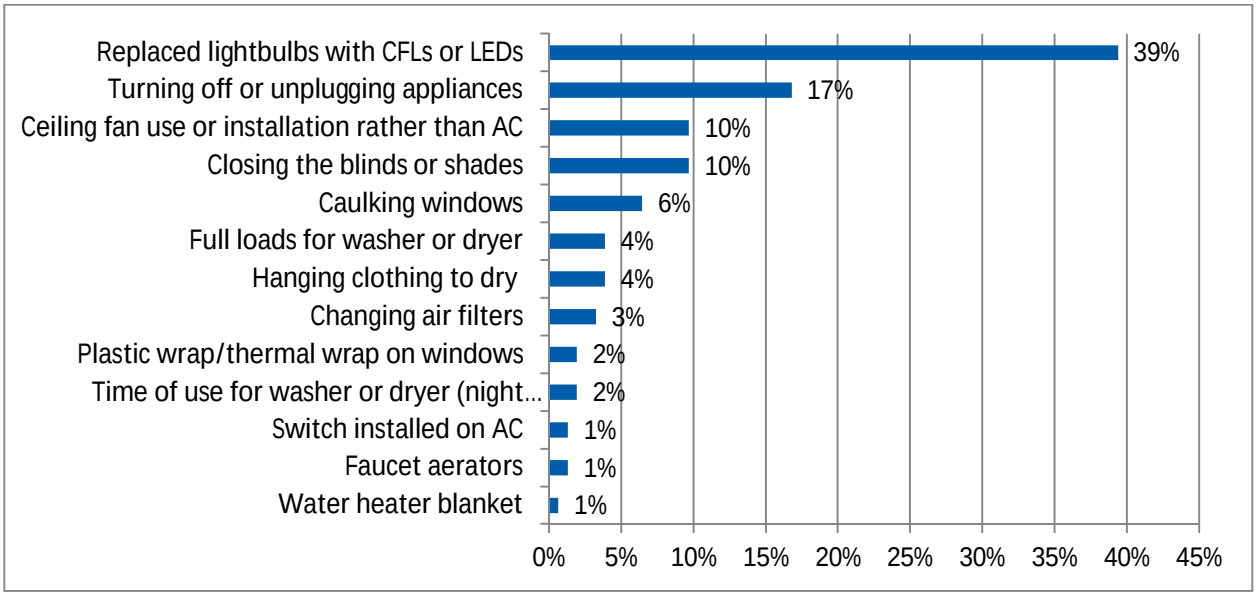
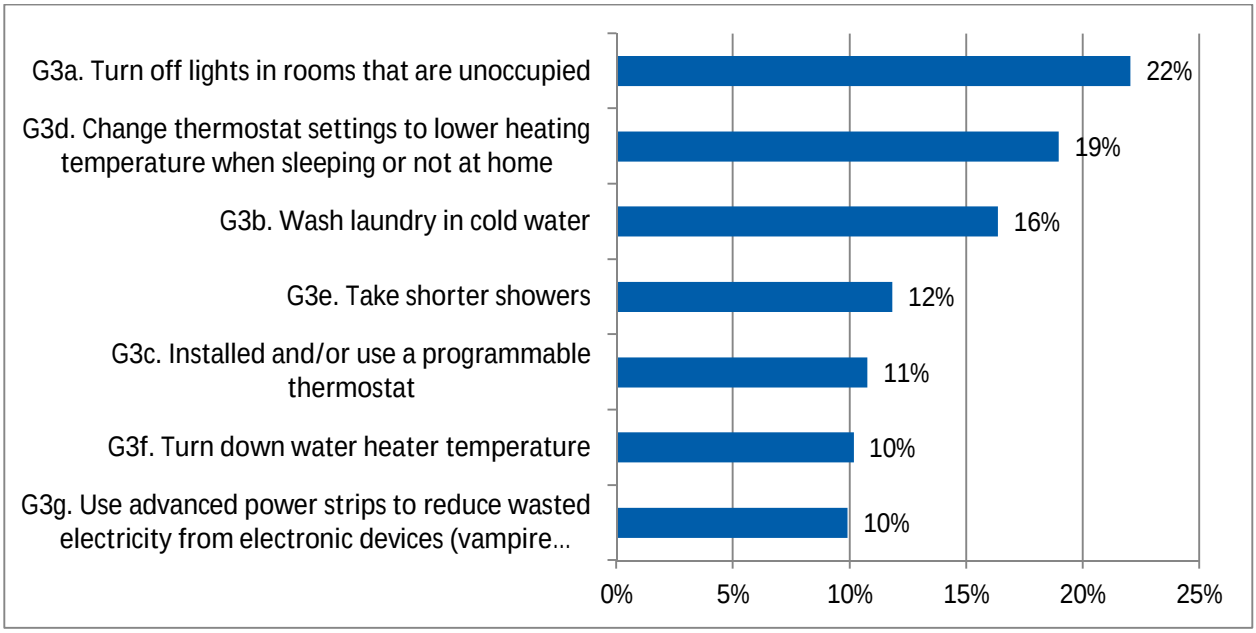
Figure 114. Actives' Unprompted Energy-Saving Actions



QG2. Please briefly describe the [energy-saving] actions you have taken [in 2013]. (n=155; multiple response accepted)

Figure 115. Actives' Prompted Energy-Saving Actions



QG3. Please indicate if you have taken any of the following actions... (n=1,171; multiple responses accepted; includes unprompted responses where matched).

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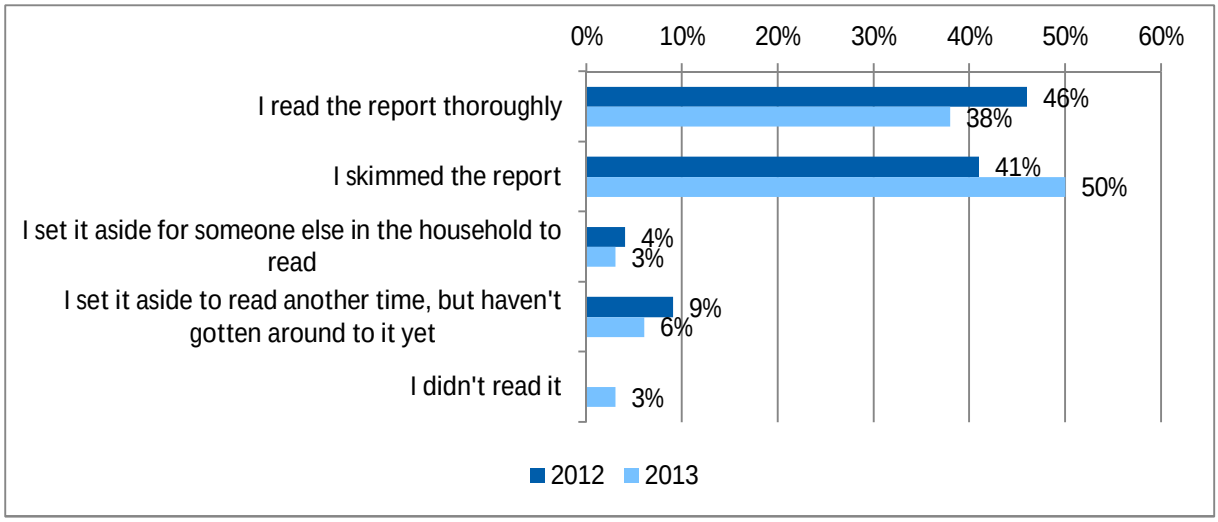
Customer Response

Readership levels and customer receptivity in 2013 remained consistent with 2012; but customer attrition reduced the number of eligible customers receiving reports.

Readership for the mailed reports remained strong in 2013, with over one-third of participants (38%) indicating that they thoroughly read the report, and 50% saying they skimmed the report (Figure 116). Significantly more Actives (56%) than Passives (38%) agreed that the reports were easy to understand. Although most survey respondents (88%) said they skimmed or thoroughly read the reports, over two-thirds of Passives (63%) were not aware of the Rewards Program website. Despite Passives' lower levels of website awareness, awareness among all Passive and Control respondents (24%) more than doubled over 2012 respondents (11%); this is a statistically significant difference.

Figure 116. Year-Over-Year Home Energy Report Readership Levels



QD2. Which of the following statements best describes what you did with the last report? (2012 n=69; 2013 n=117)

Furthermore, Active customers were more aware of actions they could take to improve the efficiency of their homes, and their behavior reflected that awareness. More Actives (95%) than Passives (80%) recalled seeing energy-saving tips in the report. The majority of Actives (69%) reported that their report gave them new ideas about ways to save energy, while less than half of Passives (41%) found the energy-saving tips helpful.

However, while many Active customers are engaged in the both their Home Energy Report and in taking energy-efficiency actions, the program implementer reported removing a portion of the targeted Direct Mail Treatment customers that had moved or closed their EAI account. As a result only about 75,000 of the 100,000 targeted customer population received all four reports in 2013.

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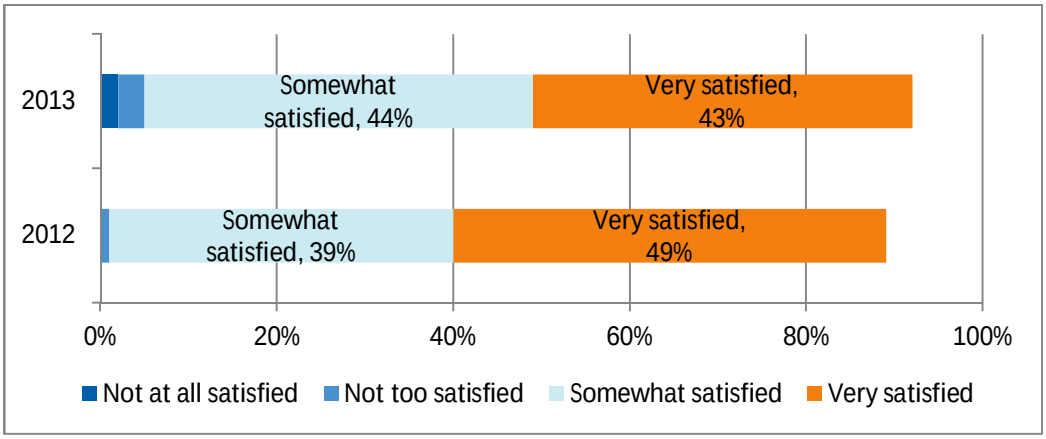
Satisfaction with the reports is high.

Roughly half of Treatment respondents (47%) reported being very satisfied with the home energy report, and the remaining participants were somewhat satisfied (48%; Figure 117). Actives and Passives reported nearly the same level of satisfaction with the reports.

Figure 117. Report Satisfaction



QD4. How satisfied are you overall with the home energy savings report? Would you say you are... (2012 n=69; 2013 n=98)

Most respondents (86% for both Actives and Passives) also indicated that the reports were somewhat or very helpful at informing them how their household's energy use compared to the previous year.

Profile

Profile characteristics point to small differences between groups.

While most Opt-In Actives (76%) reported living in a single-family home, proportionally more Opt-In Actives live in apartments or manufactured homes than DM Treatment Actives, DM Treatment Passives, or Controls. More Opt-In Actives also reported having electric water heat (69%) and living in smaller homes (14% live in a home less than 1,000 square feet) than other groups. Conversely more of the other three groups live in larger homes (that are between 2,500 and 3,000 square feet) compared with Opt-In Actives (14% compared to 3%, respectively; Figure 118). DM Treatment Actives tended to be younger than other groups (more of them were in the 25 to 54 age categories) and tended to have higher incomes.

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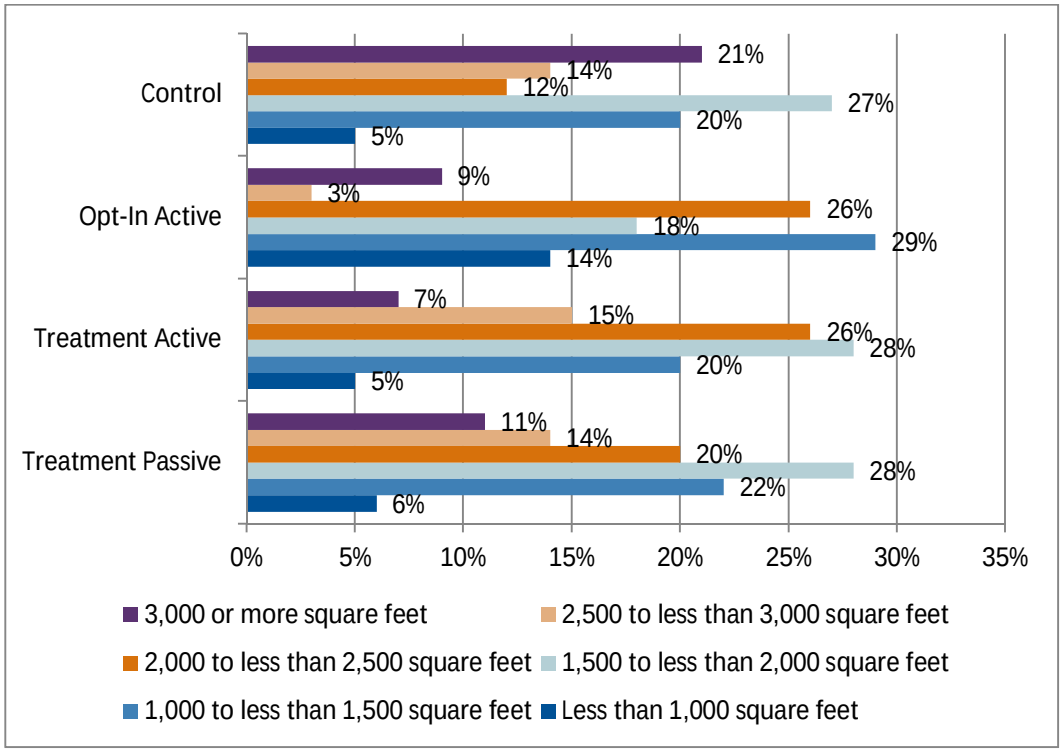
Figure 118. Home Size by Respondent Group



QI4. Approximately how many square feet of living space does your home have? (n=247)

Evaluation Recommendations

Recommendations for the Rewards Program are outlined below.

Track customers that have moved or become ineligible and replace a proportional amount across treatment and control groups to compensate this attrition.

As the program does not currently track customers that move out or become ineligible, the program should establish a procedure to identify those whose account status has changed, making them no longer available or eligible for the program. The Team recommends a quarterly refresh rate to ensure the full program design capacity for each report mailing. This will enable the program implementer to accurately account for attrition and compensate for ineligible customers by adding new customers to the pool of targeted direct mail report recipients.

Consider moving forward with formalizing the pilot as a program.

As the Rewards program has demonstrated success in achieving savings, the Team supports efforts to continue implementing the pilot as a full program with the current program design, either within the current program planning cycle or beginning with the 2016-2018 program cycle.

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Entergy

THE POWER OF PEOPLE℠

ENTERGY ARKANSAS, INC.

Arkansas Energy Efficiency Program Portfolio Annual Report

Docket No. 07-085-TF
2013 PROGRAM YEAR

April 1, 2014

Appendix D

Collateral for Entergy Arkansas, Inc. Annual Report

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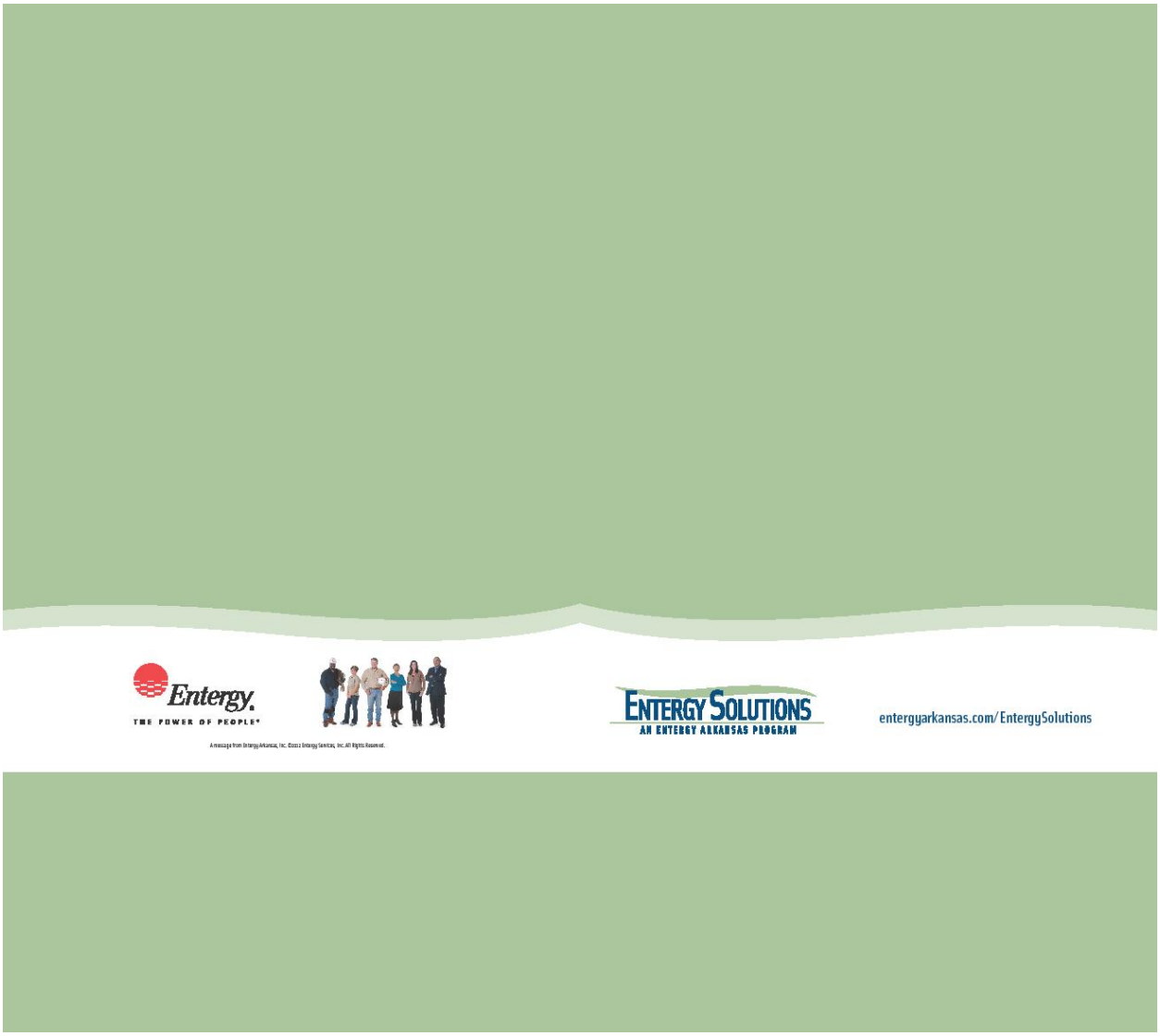
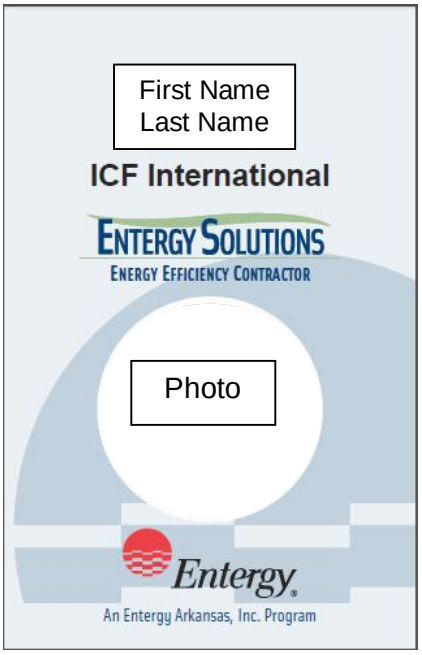


Badge Template



Envelope

2.1 Home Energy Solutions

HES Fact Sheet

FACT SHEET: 2013 Home Energy Solutions Program

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

The Home Energy Solutions Program helps homeowners achieve significant, long-term electricity savings through the use of local home energy consultants and contractors. Participating contractors will help residential customers analyze your home's energy use, identify energy efficiency improvement projects and install low-cost energy-saving measures. Residential customers will receive incentives for home energy assessments and rebates for eligible energy efficiency measures that are installed in your home.

What are the Benefits?

- Receive cash incentives in the form of instant savings coupons.
- Achieve energy savings for a quick return on your investment.
- Decrease your energy bills each month.
- Improve indoor air quality.
- Reduce your carbon footprint.

Who is Eligible?

Residential customers (renters or owners) who:

- Are current Entergy Arkansas customers.
- Have central heating and air conditioning.
- Live in a single-family home or a multifamily unit of four units or fewer.
- Live in a home that is at least one year old.

How to Participate:

Contact the Energy Efficiency Solutions Center at 877-212-2420 to speak with a representative who will ask you questions about your home and help you determine which evaluation is best for you. If you do not want an evaluation, you can contact one of our participating contractors directly to find incentives for which you may qualify. For a list of participating contractors in your area, visit **entergyarkansas.com/efficiency**.

There are two options for receiving an evaluation of the efficiency of your home in the Home Energy Solutions Program:

1. **The Tier One Survey** is a walk-though inspection of your home by a participating home energy consultant. All homes are eligible for a minimum of $75 and up to $150 in incentives toward the cost of the Tier One Survey.
2. **The Tier Two Assessment** is a much more comprehensive, diagnostic evaluation of your home's energy usage. If your home is eligible based on your energy usage and the size of your home, the program offers a minimum of $300 and up to $500 in incentives toward the cost of the Tier Two Assessment. If energy saving opportunities exist, you will be issued incentive coupons to be deducted from the participating contractor's invoice for doing the recommended work.

Eligible Measures:

- Sealing leaks in your ductwork.
- Sealing leaks in your home.
- Adding ceiling and wall insulation.
- Replacing your air conditioner or heat pump with an ENERGY STAR® qualified unit.

For a complete list of contractor-installed measures and incentive amounts, please contact the Energy Efficiency Solutions Center or visit **entergyarkansas.com/efficiency**.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/efficiency**.

HES Fact Sheet, Reverse

Typical Single-Family Home Project:

Some measures work best when combined with others, so you can receive bonus incentives for installing multiple measures. The more you do, the more you save, the more you get. Below is an example of the incentives an Entergy Arkansas customer could receive by participating in the program:

Measure	Incentive*
Energy Assessment Coupon	$300
Air Sealing Coupon	$184*
Ceiling Insulation Coupon	$437
Bonus Rebate: Bundling Air Sealing and Ceiling Insulation	$418*
Duct Sealing Coupon	$762.45*
A/C Replacement Coupon	$312.50*
Bonus Rebate: Multi-measure Assessment	up to $200*
Bonus Rebate: 15% Energy Saving Achieved	$476.99*
Bonus Rebate: Bundling New Air Conditioner and Duct Sealing	$312.50
Bonus Rebate: Installing an Air Handler with an Electronically Commutated Motor	$150
TOTAL	up to $3,553.44

In addition to the incentive, you could save $550 on your Entergy bill and $635 on your gas bill each year.

*Example above is based on a 1,900-square-foot home with R-4 ceiling insulation improved to R-38, 3.5 ton air conditioning system replaced with a 16 SEER unit with an ECM, 90% reduction in duct leakage and a 35 percent reduction in house leakage.

Note: These incentives and savings amounts are based on a typical Arkansas home. Every home is different; incentive and savings amounts will vary based on pre-existing home conditions, customer behavior and measures installed.

How Efficient is Your Home?

We created a simple equation to help you determine how energy efficient your home is. Take your highest summer electric bill in dollars and divide it by the actual conditioned square footage of your home; this will determine your cost per square foot.

You Do the Math

Calculate your home's cost per square foot, then see where you land on the home efficiency meter.

$ _____

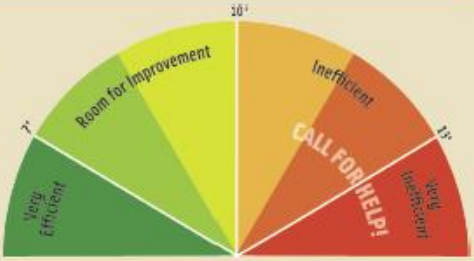
Highest Summer Electric Bill

Actual Conditioned Square Footage of Your Home

sq. ft. _____

= $/sq. ft.

For Example: $250 bill ÷ 1500 sq. ft. = $0.16/sq. ft. (or 16 cents)



Home Efficiency Meter

©2012 CLEAResult

- Great! For more energy-saving opportunities, visit entergyarkansas.com/savemoney.
- You might be overlooking additional savings. Consider a Tier One Survey to find out where.
- There is need for improvement. Consider a Tier Two Assessment now!
- Your home is costing you. Take immediate action to save money.

Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/efficiency.

HES Home Solutions Trifold

Reduce the cost of energy efficiency improvements and reduce your energy usage.

The Home Energy Solutions Program offers incentives to Entergy Arkansas customers, which can be used to offset the cost of the participating contractor's fees for installing the improvements in your home.

The following improvements are eligible to receive the incentives:

- Sealing leaks in your ductwork.
- Sealing leaks in your home.
- Adding ceiling or wall insulation.
- Replacing your air conditioner or heat pump with a high-efficiency ENERGY STAR® unit.

Learn about typical home energy efficiency savings.
Here is an example of incentive discounts you could receive to help offset the cost of having program-eligible measures installed by participating contractors. Because some improvements work best when combined with others, you can receive bonus incentives for installing more than one or two. The more you do, the more you save, the more you get!

Coupon discounts and rebates for energy efficiency improvements from Entergy Arkansas for a typical 1,900-square-foot home*:

Energy assessment discount	$300
Air sealing coupon	$184
Ceiling insulation coupon	$437
Bonus Rebate: Bundling Air Sealing and Ceiling Insulation	$418
Duct sealing coupon	$762.45
A/C Replacement Coupon	$312.50
Bonus Discount: Bundling New Air Conditioner and Duct Sealing	$312.50
Bonus Discount: Installation of Air Handler with an Electronically Commutated Motor (ECM)	$150
Bonus Rebate: Multi-measure Assessment	up to $200
Bonus Rebate: 15% Energy Saving Achieved	$461.47
The total amount of savings off the cost of the improvements that this example home could receive if all of the measures above were installed is:	$3,537.92

*Example above is based on a 1,900-square-foot home with R-4 ceiling insulation improved to R-38, 3.5-ton air conditioning system replaced with a 16 SEER unit with an ECM, 90 percent reduction in duct leakage and a 35 percent reduction in house leakage.

How do I start?

For more information or to participate in the program, call the Energy Efficiency Solutions Center toll free at 877-212-2420 to speak with an energy efficiency representative. You can also visit us online at entergyarkansas.com/efficiency to learn more.

Save energy. Save money. Make a difference. We can help.

Making energy-efficient choices is important to the environment as well as your wallet. The Home Energy Solutions Program provides benefits for you, your community and the environment.

Once you see what difference energy efficiency improvements can make in your home, you may want to participate in other available residential programs, which include:

- CoolSaver® A/C Tune-up Program.
- ENERGY STAR® Appliance Program.

For more information, call 877-212-2420 or visit entergyarkansas.com/efficiency.

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Get a home energy evaluation from Entergy Arkansas today.

If you are looking for ways to save money and energy in your home, we can help. Get up to $500 off a professional home energy evaluation and start saving energy – and money – today.

- Lower your Entergy bill.
- Increase the value of your home.
- Make your home more safe and energy efficient.
- Make your home more comfortable while using less energy.

ENTERGY SOLUTIONS
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HES Solutions Trifold, Reverse

Learn the benefits of a home energy evaluation.

Whether your home is fairly new, more than a hundred years old or somewhere in between, it could be wasting energy -- and costing you money.

If you notice any of these things in your home, you could benefit from a home energy evaluation:

- High energy bills.
- Rooms which are too hot or too cold.
- Drafty windows and doors.

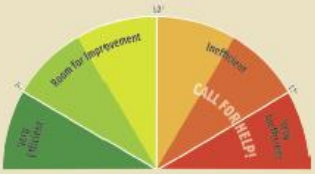
You have the power to lower your Entergy bill, and by participating in an evaluation, you also learn ways to make your home safer and more energy efficient. A more energy-efficient home will help you save money each month by making your home and living habits much more efficient.

Other benefits include:

- Improving indoor air quality.
- Increasing comfort of your home.
- Helping improve the environment in your community.

Do you want to potentially lower your Entergy bill, make your home safer, improve the environment and increase the value of your home at the same time? We can help, and here's how:

Take your highest summer energy bill and divide it by the actual conditioned square footage of your home. This number determines your cost per square foot. Then, find where this number is on the home efficiency meter. If your energy costs are 10 cents or more per square foot, your home qualifies for a tier two assessment.



Home Efficiency Meter

$_____ ÷ _____ = _____$/Sq. Ft.
(Bill Amt.) (Sq. Ft.)

Here's how easy it is to gain more control of your Entergy bill. Calculate your energy cost per square foot, using the simple formula above.

1. Call the Energy Efficiency Solutions Center toll free at 877-212-2420.
2. We will work with you to create a plan based on your budget and your specific home.
3. You can then contact a participating home energy consultant to set up an appointment at your convenience to begin the evaluation.
4. The consultant will show you the options Entergy Arkansas provides to save you money on energy efficiency improvements.
5. Finally, FREE of charge, he or she will install compact fluorescent light bulbs, smart strips and possibly other items during your evaluation.

Call 877-212-2420 today!

What can you expect during a home energy evaluation?

Your home is one of the largest investments you make, and a home energy evaluation can help uncover hidden problems. Areas of improvement we look for are related to safety, energy efficiency and even structure issues.

When you call the Energy Efficiency Solutions Center at 877-212-2420 you will learn how to set up your home energy evaluation with a professional, certified home energy consultant participating in the program.

You can choose from two types of evaluations:

Tier 1

A tier one survey is a walk-through of your home. Every residential Entergy Arkansas customer qualifies for this evaluation and will get $75 off the initial cost of the survey. You can also be eligible for up to $75 back if you install two or more qualifying measures.

Tier 2

A tier two assessment includes comprehensive testing of your home, and you can check the home efficiency meter to see if you qualify. Local home energy consultants who conduct this testing often charge $500 and as much as $750 or more, but thanks to Entergy Arkansas, you will receive $300 off the participating consultant's price and be eligible for up to $200 back if you install two or more qualifying measures.

The consultant will identify the best energy-saving improvements for your home and work with you to create a plan based on the results of your evaluation and your budget. As part of the evaluation, FREE of charge, the consultant will install energy-efficient compact fluorescent light bulbs, smart strips and possibly other items during your evaluation.

Entergy Arkansas can also offset the costs of many home efficiency upgrades. If you do not wish to have an evaluation performed, you may contact a participating contractor directly to see if you qualify for specific upgrade discounts.

You can find the list of participating contractors at **entergyarkansas.com/efficiency**.

HES Yard Sign

HES Contractor Banner

ENAR Co-Op Survey

Co-op Survey

Company Name: _____

Phone Number: _____ Primary Contact: _____

Date: _____ Email: _____

1. Which marketing package(s) did you select for your company's use?

- ☐ Program Brochures
- ☐ Kit 1
- ☐ Banner
- ☐ Name Badges
- ☐ Kit 2
- ☐ Business Cards
- ☐ Program Fact Sheets
- ☐ Truck Sign
- ☐ Yard Signs
- ☐ Custom: _____

2. Please rate how satisfied you were with the marketing package offerings on a scale of one to five (five being highest).

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. What improvements can we make to our service?

_____

_____

_____

4. Additional comments.

_____

_____

_____

Please send completed survey to Jess Carson:

Mail: Home Energy Solutions
1 Allied Dr
Little Rock, AR 72202

Fax: 501-265-0189
Email: jess.carson@clearesult.com

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HES Mobile E-Blast

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How does more money in your pocket sound?

Do you want to...

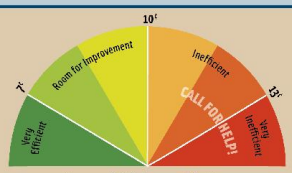
- Lower your monthly Entergy bill?
- Increase the efficiency of your home?
- Make your home safer?
- Improve comfort and indoor air quality?
- Increase the value of your home?
- Reduce your carbon footprint?

Click HERE or call us at 877-212-2420 to start saving today.

The Home Efficiency Meter below was created to help customers like you determine how efficient, or inefficient, your home is and identify potential problems that may be affecting the efficiency of your home, including:

- Inadequate ceiling insulation.
- Leaky duct systems.
- Home air leakage (gaps, cracks, and holes in ceilings, walls and floors).
- Inefficient heating and cooling equipment.

Determine your home's efficiency using the meter and simple formula:



Home Efficiency Meter

You Do the Math

Calculate your home's cost per square foot, then see where you land on the home efficiency meter.

$$\frac{\text{Highest Summer Electric Bill}}{\text{Actual Conditioned Square Footage of Your Home}} = \$/\text{sq. ft.}$$

Using a calculator or separate sheet of paper, divide the amount of your highest summer electric bill by the actual conditioned square footage of your home.

***For Example**: $250 bill ÷ 1500 sq. ft. = $0.16/sq. ft. (or 16 cents)*

Then, locate the cost per square foot on the Home Efficiency Meter above to determine your home's efficiency.

- Congratulations!
- Not bad.
- Not good. Your home is inefficient.
- Bad. Your home is costing you.

Entergy Arkansas' Entergy Solutions Programs are available to help you assess what actions need to be taken to improve the efficiency of your home.

Visit us at EntergyArkansas.com/efficiency or call us at 877-212-2420 to start saving today.

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If you wish to no longer receive emails on the Entergy Commercial and Industrial Prescriptive Program containing news, promotions or special offers, Click to Unsubscribe.

ENAR HES Incentives

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Home Energy Solutions Program
Available 2013 Incentives

Evaluation Incentives

Measure	Coupon Details	Coupon Amount
Tier 1 survey	Survey completed by participating Home Energy Consultant.	$75 deducted from survey invoice.
Tier 1 survey Bonus	Complete a survey and install two more measures.	Up to $75 sent to customer after installation of two or more measures.
Tier 2 Assessment	Assessment completed by participating HEC.	$300 deducted from assessment invoice.
Tier 2 Assessment Bonus	Complete a survey and install two or more measures.	Up to $200 sent to customer after installation of two or more measures.

Contractor-installed Measures

Measure	Coupon Details	Coupon Amount
Ceiling Insulation	▸ Qualify for and complete a Tier 2 Assessment. ▸ OR contact a participating contractor directly.	Average 2013 Incentive: $300.00 Highest 2013 Incentive: $901.80

Coupon Calculation: Ceiling Insulation

	Sq. Ft. Ceiling Insulation Installed	Multiplier	Multiplier if air infiltration coupon (including attic sealing) is completed	Coupon Subtotal	Total Coupon
0 to 4		X .23	X .45		$_____
5 to 8		X .19	X .39		
9 to 14		X .16	X .31		
15 to 22		X .09	X .18		

Air Sealing	▸ Qualify for and complete a Tier 2 Assessment. ▸ OR contact a participating contractor directly.	Average 2013 Incentive: $237.30 Highest 2013 Incentive: $1,037.25

Coupon Calculation: Air Sealing

Starting CFM50		Final CFM50		Air Sealing Result (Min. 20% Reduction from starting CFM50 to qualify)*	Rebate Value	Total Coupon
Measured Cap* 6,500	Subtract		=		X $0.25	$_____

*Starting CFM50 for coupon calculation cannot exceed 6,500 CFM50. Use the smaller of Measured or Cap for starting CFM50. Min. 20% reduction must be calculated from the smaller of Measured or Cap.

Measure	Coupon Details	Coupon Amount (Deducted from Participating Contractor's Invoice)
Wall Insulation	▸ Qualify for and complete a Tier 2 Assessment. ▸ OR contact a participating contractor directly.	Average 2013 Incentive: $620.29 Highest 2013 Incentive: $1,537.20

Coupon Calculation: Wall Insulation

HVAC Type	Sq. Ft. of Wall Insulation Installed	Rebate Amount	Total Coupon
Gas Heat (no air conditioning)	Does Not Qualify	----	$_____
Electric AC/ Gas Heat		X 0.60	
Heat Pump		X 0.80	
Electric AC/ Resistance Heat		X 0.90	

Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/efficiency.**

ENAR HES Incentives, Reverse

Duct Sealing	▸ Qualify for and complete a Tier 2 Assessment. ▸ OR contact a participating contractor directly.	Determined after final leakage rate known. Average 2013 Incentive: $631.05 Highest 2013 Incentive: $1,913.20
A/C Replacement	▸ Qualify for and complete a Tier 2 Assessment. ▸ OR contact a participating contractor directly.	Average 2013 Incentive: $302.55 Highest 2013 Incentive: $862.74

Coupon Calculation: Air Conditioner Replacement

Tonnage	14.5-14.99 SEER	15-15.99 SEER	16-16.99 SEER	17+ SEER	Duct Sealing Bonus?	Furnace Fan ECM Bonus?	Total Coupon
1.5	$ 47.94	$ 89.25	$133.92	$178.05	x2	Furnace Model Number	$_____
2.0	$ 63.95	$119.22	$178.47	$237.49			
2.5	$ 79.98	$148.97	$223.02	$296.93		Furnace Serial Number	
3.0	$ 96.02	$178.72	$267.84	$356.37			
3.5	$111.85	$208.25	$312.50	$416.50		+$150	
4.0	$127.89	$238.22	$356.94	$474.98		☐ Check box if old furnace did not have an ECM.	
5.0	$159.96	$297.93	$446.31	$593.85			

Please use the matrix to determine the eligible coupon $ amount for your specific project. (Minimum qualifications: Split or Package Systems 14.5 SEER and 12 EER)

Measure	Coupon Details	Coupon Amount (Deducted from Participating Contractor's Invoice)
Heat Pump Replacement	▸ Complete a Tier 2 Assessment. ▸ Contact a participating contractor directly.	Average 2013 Incentive: $641.13 Highest 2013 Incentive: $1,444.66

Coupon Calculation: Heat Pump Replacement

Tonnage	14.5-14.99 SEER	15-15.99 SEER	16-16.99 SEER	17+ SEER	Duct Sealing Bonus?	Furnace Fan ECM Bonus?	Total Coupon
1.5	$ 66.31	$116.49	$171.80	$242.87	x2	Fan Coil Model Number	$_____
2.0	$88.22	$155.32	$229.02	$323.57			
2.5	$110.22	$194.27	$286.39	$404.46		Fan Coil Serial Number	
3.0	$132.22	$232.97	$343.60	$485.35			
3.5	$154.33	$271.80	$400.82	$566.24		+$150	
4.0	$176.44	$310.76	$458.19	$647.33		☐ Check box if old fan coil did not have an ECM.	
5.0	$220.44	$388.29	$572.62	$809.11			

Please use the matrix to determine the eligible coupon $ amount for your specific project. (Minimum qualifications: Split or Package Systems 14.5 SEER, 12 EER and 8.2 HSPF)

Customer Savings Bonus 1	▸ Complete a Tier 2 Assessment and install two or more measures. ▸ Achieve electric energy savings between 15-29% (as determined by the modeling software AFTER measures are installed).	15% of total implemented measure incentive value. Rebate sent to customer upon measure verification. Average 2013 Incentive: $254.54 Highest 2013 Incentive: $457.02
Customer Savings Bonus 2	▸ Complete a Tier 2 Assessment and install two or more measures. ▸ Achieve electric energy savings of 30% (as determined by the modeling software AFTER measures are installed).	30% of total implemented measure incentive value. Rebate sent to customer upon measure verification. Average 2013 Incentive: $661.43 Highest 2013 Incentive: $1,329.74

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APSC FILED Time: 4/1/2014 12:32:02 PM: Recvd 4/1/2014 11:41:33 AM: Docket 07-085-TF-Doc. 443

HES Car Magnet

Home Energy Solutions Program

501-265-0249

entergyarkansas.com/efficiency

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APSC FILED Time: 4/1/2014 12:32:02 PM: Recvd 4/1/2014 11:41:33 AM: Docket 07-085-TF-Doc. 443

HES Truck Magnet

Home Energy Solutions Program

Participating Contractor

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HES Marketing Collateral Order Form

HOME ENERGY SOLUTIONS MARKETING COLLATERAL ORDER FORM

Participating Contractors: This form will be used to order the available marketing collateral for the Home Energy Solutions Program. Please review all notes regarding each piece of collateral, as special instructions must be followed for certain items. Your allotted budget for the 3-month period spanning from 9/1/13 through 11/30/13 is $1500. Please contact Jess Carson at (501) 221-4024 or jess.carson@clearesult.com with any questions.

Marketing Collateral – No Charge				
Item	Notes	Price	Quantity	Total
Program Brochures	Up to 200 at a time	$0		
Name Badges		$0		
Program Fact Sheets	Up to 200 at a time	$0		
Marketing A La Carte Items				
Item	Notes	Price	Quantity	Total
Yard Signs	Minimum Order – 10	$22 each		
Door Hanger	Minimum 250	$50 per 250		
Truck Sign		$22 each		
Banner		$150		
Business Cards	250 cards per person	$45 (250 minimum)		
Marketing Kits			Quantity	Total
Kit 1:	250 Door Hangers, 250 Business Cards, 10 Yard Signs - $315			
250 Door Hangers to promote your company; 250 Business Cards for a primary contact to put in the door hanger bag; 10 yard signs to place in satisfied customer's yards after work is completed. $315 per kit.				
Kit 2:	Banner (96"x34"), 250 Business Cards - $190			
If you are attending a promotional event such as a trade show, the banner can be used as a backdrop to your promotional area. This also includes 250 business cards for a primary contact. $190 per kit.				
Custom Campaign				
If your company already has a marketing piece/existing collateral, you may use the allotted budget to pay for the production/distribution of materials as long as it is pre-approved and includes program branding. ** Please refer to the Custom Collateral guidelines for proper use of marketing materials using program logos.*				
Custom Collateral Guidelines				
1. Every piece of marketing collateral must be pre-approved. 2. To use program ad template: Send Jess Carson requested copy for white block; she will send copy-ready version of ad template. 3. For custom pieces: Send your draft copy to Jess. Implement her recommended revisions (if any) and send back to Jess. She will then send to Communications/Entergy for final approval. 4. We must have final ad copy and paid invoice before you can be reimbursed. 5. We will pay up to the allotted budget for the advertising. If advertising exceeds $1500, contractor is responsible for remaining balance.				
				Final Total

ENTERGY SOLUTIONS

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2.2 CoolSaver©

CoolSaver© Fact Sheet, Commercial

FACT SHEET: 2011-2013 Commercial CoolSaver© A/C Tune-up Program

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

The Commercial CoolSaver Program is designed to overcome market barriers that prevent customers from receiving high performance air conditioning and heat pump system replacements or tune-ups. Energy savings are captured through identifying air conditioning and heat pump system inefficiencies during the tune-up and correcting these system inefficiencies. CoolSaver provides incentives, training on best practices and discounts on high quality tools for contractors to conduct high performance system tune-ups as well as ensure replacement systems run at optimal efficiency.

What are the Benefits?

- Instant discount applied to the cost of an air conditioner tune-up.
- A CoolSaver tune-up performed with precision digital instruments will increase your system's efficiency.
- Reduced cooling costs.
- Extending the life of your equipment.
- Better humidity control.

Who is Eligible?

All Entergy Arkansas commercial customers with a central air conditioner up to 25 tons and at least one year old. (Systems that have been incentivized though the CoolSaver Program in the past five years are not eligible to receive these incentives.) All air conditioners meeting these criteria qualify.

How to Participate:

Please follow the steps below to participate:

1. Contact the Energy Efficiency Solutions Center at 877-212-2420 or entergy-coolsaver@clearesult.com.
2. Your participating contractor will conduct an evaluation using precision digital tools to identify energy-saving improvement opportunities and determine if you will benefit from a high performance tune-up.
3. Contractor will thoroughly clean condenser coils and, if necessary, clean evaporator coils and blowers as well as adjust refrigerant charge to manufacturer's specification.
4. Once the tune-up is completed, your contractor will apply the instant discount to the final invoice.

CoolSaver Incentive Rates

Measure type	Incentive Level	Measure Description
High Performance A/C Tune-up	*The customer may receive a $175 - $200 discount for having the following services performed:* • Cleaning evaporator coil. • Cleaning outdoor condenser. • Cleaning blower. • Adjusting refrigerant charge to manufacturer specification.	Pending customer approval, typical improvement measures include: airflow correction, cleaning of indoor blower, evaporator coils, condenser coils and correction of refrigerant charge using program-required tools and procedures. Program test-out data is measured and collected by a program-qualified technician.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/your_business**.

CoolSaver© Fact Sheet, Residential, no crop FINAL

FACT SHEET: 2013 Residential CoolSaver® A/C Tune-up Program

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

The Residential CoolSaver Program is designed to overcome market barriers that prevent customers from receiving high performance air conditioning and heat pump system tune-ups. Energy savings are captured through identifying air conditioning and heat pump system inefficiencies during the tune-up and correcting these. CoolSaver provides incentives, training on best practices and discounts on high quality tools for contractors to conduct high performance system tune-ups as well as ensure replacement systems run at optimal efficiency.

What are the Benefits?

- Instant discount applied to the cost of an air conditioning tune-up.
- A CoolSaver tune-up performed with precision digital instruments will increase your system's efficiency.
- Reduced cooling costs.
- Extending the life of your equipment.
- Better humidity control.

Who is Eligible?

All Entergy Arkansas residential customers with a valid account number and whose central air conditioning systems are at least one year old. (Systems that have been incentivized though the CoolSaver Program in the past five years are not eligible to receive these incentives.)

How to Participate:

Please follow the steps below to participate:

1. Contact the Energy Efficiency Solutions Center at 877-212-2420 or entergy-coolsaver@clearesult.com.
2. Your participating contractor will conduct an evaluation using precision digital tools to identify energy-saving improvement opportunities and determine if you will benefit from a high performance tune-up.
3. Contractor will thoroughly clean condenser coils and, if necessary, clean evaporator coils and blowers as well as adjust refrigerant charge to manufacturer's specification.
4. Once the tune-up is completed, your contractor will apply the instant discount to the final invoice.

CoolSaver Incentive Rates

Measure type	Incentive Level	Measure Description
High Performance A/C Tune-up	*The customer may receive a $175 discount for having the following services performed:* • Cleaning evaporator coil. • Cleaning outdoor condenser. • Cleaning blower. • Adjusting refrigerant charge to manufacturer specification.	Pending customer approval, typical improvement measures include: airflow correction, cleaning of indoor blower, evaporator coils, condenser coils and correction of refrigerant charge using program-required tools and procedures. Program test-out data is measured and collected by a program-qualified technician.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/your_home.**

CoolSaver© Fact Sheet, Residential FINAL

FACT SHEET: 2013 Residential CoolSaver® A/C Tune-up Program

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

The Residential CoolSaver Program is designed to overcome market barriers that prevent customers from receiving high performance air conditioning and heat pump system tune-ups. Energy savings are captured through identifying air conditioning and heat pump system inefficiencies during the tune-up and correcting these. CoolSaver provides incentives, training on best practices and discounts on high quality tools for contractors to conduct high performance system tune-ups as well as ensure replacement systems run at optimal efficiency.

What are the Benefits?

- Instant discount applied to the cost of an air conditioning tune-up.
- A CoolSaver tune-up performed with precision digital instruments will increase your system's efficiency.
- Reduced cooling costs.
- Extending the life of your equipment.
- Better humidity control.

Who is Eligible?

All Entergy Arkansas residential customers with a valid account number and whose central air conditioning systems are at least one year old. (Systems that have been incentivized though the CoolSaver Program in the past five years are not eligible to receive these incentives.)

How to Participate:

Please follow the steps below to participate:

1. Contact the Energy Efficiency Solutions Center at 877-212-2420 or entergy-coolsaver@clearesult.com.
2. Your participating contractor will conduct an evaluation using precision digital tools to identify energy-saving improvement opportunities and determine if you will benefit from a high performance tune-up.
3. Contractor will thoroughly clean condenser coils and, if necessary, clean evaporator coils and blowers as well as adjust refrigerant charge to manufacturer's specification.
4. Once the tune-up is completed, your contractor will apply the instant discount to the final invoice.

CoolSaver Incentive Rates

Measure type	Incentive Level	Measure Description
High Performance A/C Tune-up	***The customer may receive a $175 discount for having the following services performed:*** • Cleaning evaporator coil. • Cleaning outdoor condenser. • Cleaning blower. • Adjusting refrigerant charge to manufacturer specification.	Pending customer approval, typical improvement measures include: airflow correction, cleaning of indoor blower, evaporator coils, condenser coils and correction of refrigerant charge using program-required tools and procedures. Program test-out data is measured and collected by a program-qualified technician.

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CoolSaver© Quick Start Program Guide

CoolSaver© A/C Tune-up Quick Start Guide 2013

Program Measures:

High Performance CoolSaver A/C Tune-up

A/C or Heat Pump Replacements with 15.0 SEER or greater AHRI-rated system (small business customers only).

Eligible Customers and Applications:

Customer Eligibility

High Performance CoolSaver A/C Tune-ups

- All residential Entergy Arkansas customers (single family, apartments, condos).
- All commercial Entergy Arkansas customers (any size or class account).
- Must have valid Entergy account number.

A/C replacements

- Small commercial customers only (up to and including 100kW maximum demand charge). CLEAResult will verify whether customers meet this qualification using the name and service address or the utility account number.

System Eligibility

- Package units or split systems, A/C or heat pump, up to and including 25 tons maximum capacity.
- Must be at least a one-year old installation; central A/C or heat pump only. (No PTACs, window units, ductless mini-splits or geothermal).
- Not eligible for incentives if a CoolSaver A/C Tune-up has been performed in the last five years.
- All systems belonging to that customer are eligible, as long as they meet the qualifications above for size, age and time since last CoolSaver A/C Tune-up.

- Replacement equipment must not only meet the minimum ENERGY STAR® qualifications, but also be at least 15.0 SEER, 12.0 EER and for heat pumps, 8.2 HSPF and a maximum capacity of 65,000 Btuh.
- AHRI listing must be provided.
- Installation must be a replacement of an existing central A/C or heat pump. No new construction, additions or replacement of other type systems (window units, PTACs, etc.).
- All systems belonging to that customer are eligible for the replacement incentive, so long as they meet the qualifications above for size and efficiency.

Incentives:

CoolSaver A/C Tune-up customer discount:

- $175 for 5 tons and less.
- $200 for 5+ tons.

A/C replacements customer discount:

- $300 per qualified system replacement.

All discounts are given directly to the customer, subtracted from the contractor's invoice. Contractors are reimbursed by the program for all approved submissions.

CoolSaver© Quick Start Program Guide, Reverse

CoolSaver

Participation Requirements:

1. Complete the participation agreement.
2. Send all required additional documentation, including Arkansas HVAC license, proof of $1 million general liability and proof of business capability.
3. Must have program-required toolkit in order to attend training, perform tune-ups and offer HVAC replacement rebates. See toolkit specifications sheet for more details.
4. Technicians must successfully complete a one-day training and demonstrate field competency (using the program toolkit properly) in order to earn a technician qualification number. This number is required on all submitted tune-ups.
5. You/Your technicians will need a Windows 7 or Windows 8 device (PC or tablet) to use in the field in order to calculate airflow using the static pressure method (preferred for roof-top packages, but not necessary for split systems). There is a one-page data collection field form used to record system data required by the program. It is your choice whether to enter this data into the Windows 7 or Windows 8 device in the field or in the office. The data must be entered into the computer-based application in order to upload it to CLEAResult for processing and payment. Some contractors use a central office data-entry person for this so long as the field forms are completed legibly.
6. Once you complete all of the above and are qualified, you will be listed on the Entergy Arkansas website as a participating contractor. You will be able to use the program-approved marketing materials, including truck signs, name badges, CoolSaver technician business cards, door hangers, yard signs, postcards and print ads.

Processing and Payments:

1. CLEAResult, the program administrator, downloads all uploaded tune-up files from our server once per week. Tune-up files submitted by 6 a.m. each Monday will be downloaded for processing that week. Any tune-up files submitted after 6 a.m. will not be downloaded until the following Monday. Customer invoices for CoolSaver A/C Tune-ups must also be submitted by this deadline or will be delayed until the following week.
2. Each tune-up is verified to ensure it is not a duplicate or has not had a CoolSaver A/C Tune-up done in the past five years.
3. The customer's account is verified as a valid Entergy account and the tune-up is matched to a CoolSaver A/C Tune-up customer invoice. If the tune-up does not pass verification, it will be designated as a NIGO (Not In Good Order) and you will be sent an email notification detailing what other information is needed.
4. If the tune-up does pass verification, it will go through engineering review for technical accuracy and if passed, will be approved for payment. Any tune-ups failing engineering review will be designated for field follow-up by the technical trainer to make corrections or provide additional data. Upon completing this step, the tune-up will either be approved for payment or permanently rejected.
5. CLEAResult administers the incentive account on behalf of Entergy Arkansas and makes payment every Friday for all approved tune-ups.

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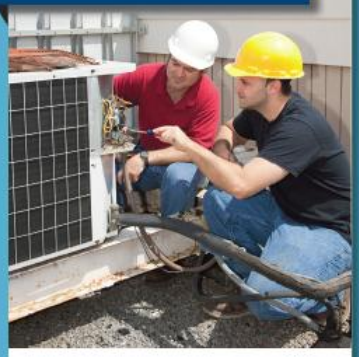
CoolSaver© Trifold

CoolSaver© Trifold, Reverse

Air conditioning system not working as efficiently as it should be?



Tune it up!

A CoolSaver® A/C Tune-up can improve the cooling output and efficiency of your air conditioning unit by up to 30 percent.

2013 PROGRAM INCENTIVES	
Residential	Commercial
$175 per Tune-up	$175 per Tune-up ≤ 5 tons $200 per Tune-up > 5 tons

Note: Rebates are available for HVAC replacements when system is replaced with ENERGY STAR® qualified equipment.

CoolSaver®

With a CoolSaver© A/C Tune-up, you'll enjoy:

- **A more dependable, longer-lasting unit.**
- **A lower energy bill each month.**
- **Cooler indoor environment.**
- **Better humidity control.**
- **Instant savings discounts toward the cost of a CoolSaver A/C Tune-up.**

Who is eligible?

- **Residential:**
  All Entergy Arkansas customers with a valid account number with a central air conditioner system that's at least one year old.
- **Commercial:**
  All Entergy Arkansas commercial customers with a central air conditioner system up to 25 tons.

  Systems previously tuned up by the CoolSaver Program are not eligible to receive incentives for five years.

How does it work?

A program-qualified technician will identify ways to improve the efficiency of your air conditioner, implement any recommended improvements, and apply the discount to the services.

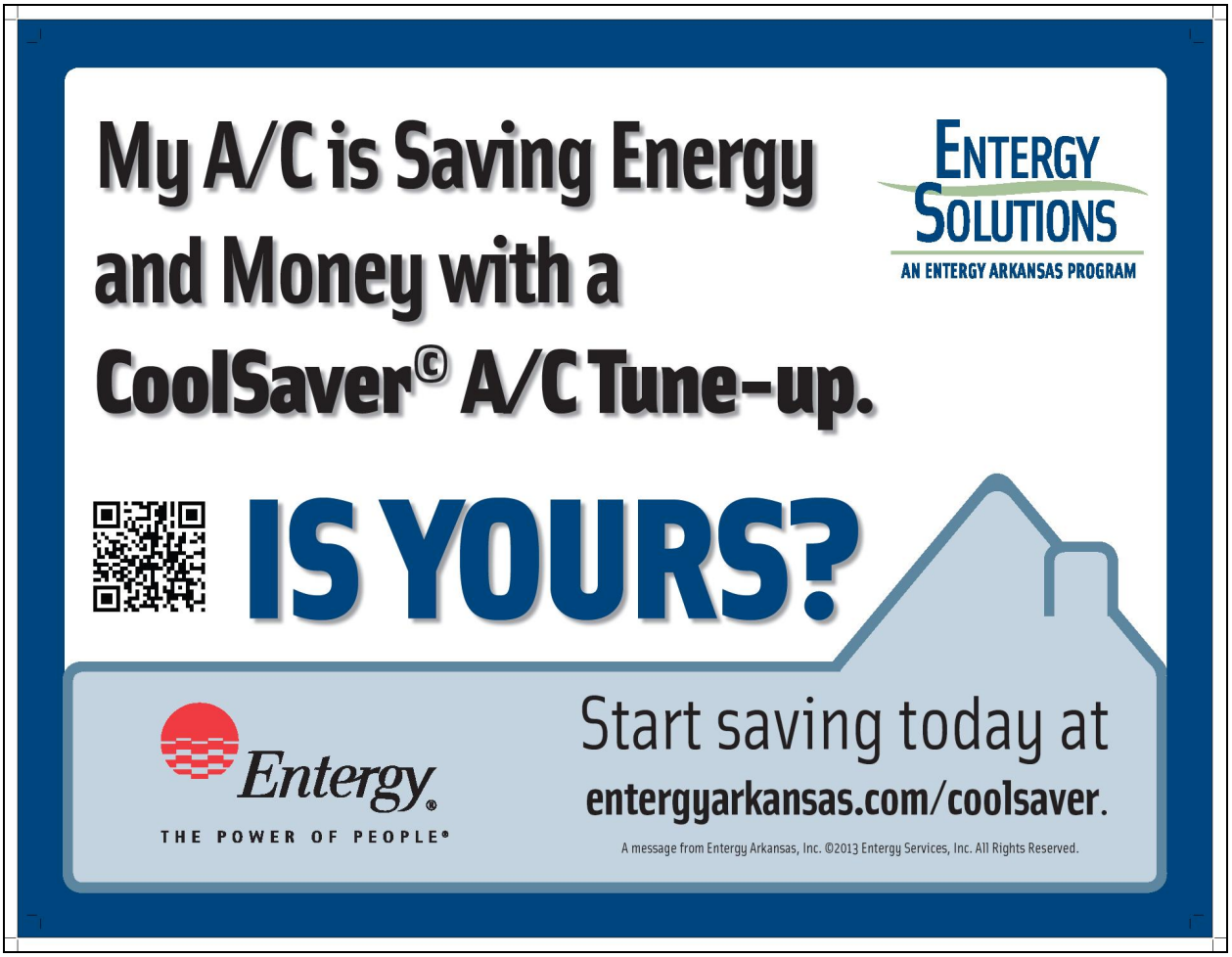
Our state-of-the-art diagnostic tools and procedures will result in cooler air inside your home or building, increased air conditioner performance and lower energy bills.

Notice the difference between dirty coils and coils after a CoolSaver A/C Tune-up:

During a CoolSaver Tune-up, your technician will:

- **Measure** indoor airflow at filter grill and correct if needed.
- **Inspect** filter and change or clean if dirty.
- **Clean** outdoor condenser coils.
- **Inspect** indoor coil with videoscope and clean if dirty.
- **Inspect** indoor blower and clean if dirty.
- **Adjust** refrigerant charge to manufacturer's specifications using digital refrigerant analyzer.
- **Test** air conditioner to verify how much cooling you're actually getting.
- **Apply** a $175-$200 dollar discount from Entergy Arkansas to your invoice.

CoolSaver© Yard Sign



CoolSaver© Summer Flyer FINAL

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Save Money

And Take The Guesswork Out Of Budgeting A/C Replacements With CoolSaver©.

The CoolSaver® A/C Tune-up Program gives you the power to save money, increase home or office comfort and extend the life of your air conditioner or heat pump system. Not to mention, Entergy Arkansas provides incentive dollars to help offset the cost of the service!

If you are a commercial customer with multiple units, one of our participating contractors will provide you with a CoolSaver A/C Tune-up report. This report includes a summary of your facilities' units, including the number of tune-ups performed, estimated savings for one year and five years, average cooling increase and average energy efficiency rating increase.

The report scores your units in terms of how closely they meet the recommended minimum criteria for SEER and cooling capacity. Such scoring allows you to accurately budget red units for replacement.

GREEN: Both criteria met.
YELLOW: One of two criteria met.
RED: Neither met.

CoolSaver Project Summary Example:

Summary of All Activities	
Tune-ups Performed	80
Performance Breakdown	
Estimated KW Savings	28.9
Estimated KWh Savings	41,709
Estimated Year 1 Savings	$4,170.90
Estimated 5-year Lifetime Savings	$45,147.60
Average Capacity Increase (BTU)	5,595
Average EER Increase	1.48
Screening Criteria	
Ending SEER Threshold	9.00
Ending Percentage of Rated Cooling Capacity	70%
$ per KWh	$0.10
Results	
Recommended Action	*Quantity of Units*
Unit meets or exceeds minimum SEER and capacity after adjustments. Continue maintenance to maintain savings.	37
Unit does not meet one of the SEER or capacity criteria. Based on the age of the unit, correct problems or budget for replacement.	11
Unit does not meet either requirement for SEER or capacity. Budget for replacement.	32

Account Name	Service Address	Project ID	Unit ID	Outdoor Unit or Compressor Manufacturer	Outdoor Unit or Compressor Model #	Outdoor Unit or Compressor Serial #	End SEER	End Cap vs. Rated	Score
XYZ Jr. High	6121 Durant Dr	Paul 5230_2011 _08_16_1	RTU 21	Carrier	50HJ012661	3701G3411	5.4	52.48%	0
XYZ Jr. High	6121 Durant Dr	Paul 5230_2011 _08_16_2	RTU 23	Carrier	50HJ012661	4001G3122	5.11	71%	1
XYZ Jr. High	6121 Durant Dr	Paul 5230_2011 _08_15_1	RTU 24	Carrier	50HJ008631	4501G5028	6.7	73.24%	1

The CoolSaver A/C Tune-up Report also provides specific information about each individual unit in your facility. The data generated for each unit includes the location, type, serial number, model, delivered SEER rating and an efficiency color score.

Want to know more about the units in your facility? Call **877-212-2420** or visit **entergyarkansas.com/coolsaver** for more information and to find a participating contractor in your area.

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CoolSaver© Cover Letter

ENTERGY SOLUTIONS
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Dear HVAC Business Owner:

Thank you for committing to participate in the Entergy Arkansas CoolSaver® A/C Tune-up Program! We are here to help you enjoy success in the program by supporting you in a number of ways. This packet is designed to provide you with valuable, at-hand information, including:

- Participating contractor program manual
- Program rules
- Customer eligibility
- Toolkit components
- Technician training and qualification requirements
- Payment processing procedures
- Pre-approved marketing materials available for use
- Suggested phone scripts and speaking points
- Entergy marketing brand guidelines
- Sample business models for success

All of this information is critical to your success in the program, so please share this helpful resource with your staff or team members. We are here to help you make the CoolSaver Program a significant and profitable part of your business; please don't hesitate to call or email with questions or concerns. Here's to a great year!

We look forward to working with you,

Joe Kuonen
CoolSaver Program Manager

CoolSaver®

CoolSaver© Contractor Flyer FINAL

Build Your Business.

Do you want to help your customers boost energy savings and improve the comfort of their homes and businesses? Do you want to increase your business and earn incentives at the same time? Achieve both by joining the CoolSaver© Program as a participating HVAC contractor today.

Benefits for business owners:

- Sign more maintenance contracts.
- Increase your customer base.
- Receive more dollars per CoolSaver Tune-up.
- Eliminate a large percentage of your call backs.
- Keep your technicians busy during the off season.

Benefits for technicians:

- Raise your level of expertise.
- Use digital state-of-the-art Entergy approved tools.
- Receive ongoing technical training.
- Learn to calculate the BTU output of each CoolSaver Tune-up.
- Learn to master precision refrigerant adjustment techniques.

Benefits for customers:

- Lower Entergy bills.
- A more comfortable indoor environment.
- Better humidity control.
- Understand the value of continuing maintenance.
- Increased system efficiency.

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CoolSaver© Contractor Flyer FINAL, Reverse

Same Program. Higher Incentives.

2013 PROGRAM INCENTIVES	
Residential	Commercial
$175 per Tune-up	$175 per Tune-up ≤ 5 tons $200 per Tune-up > 5 tons

Note: Rebates are available for HVAC replacements when system is replaced with ENERGY STAR® qualified equipment.

ELIGIBLE CUSTOMERS	
Residential	Commercial
Single family homes (every A/C or heat pump)	School districts (k-12), private schools
Condos	Technical and community colleges
Multifamily apartments	Factories, manufacturing facilities
Housing authorities	Large malls, strip malls, convenience stores
Property management firms	Large and small commercial space (offices, banks)

About the Program

- The CoolSaver A/C Tune-up Program is designed to overcome the market barriers that prevent commercial and residential customers from receiving high-performance air conditioning and heat pump system tune-ups.
- Energy savings are captured through identifying air conditioning and heat pump system inefficiencies during the tune-up and correcting these.
- The program provides incentives to both customers and participating contractors, training on best practices and discounts on state-of-the-art tools for contractors to conduct system tune-ups as well as ensure replacement systems run at optimal efficiency.

Superior Service

As a participating contractor, you are responsible for ensuring the following areas are evaluated during each CoolSaver Tune-up:

- Airflow correction.
- Cleaning of indoor blower, evaporator coils and condenser coils.
- Correction of refrigerant charge.

Join the growing number of participating contractors today! To learn more, contact us at (501) 221-4002 or cnevins@clearesult.com.

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CoolSaver© Contractor Agreement FINAL

ENTERGY ARKANSAS COOLSAVER© CONTRACTOR AGREEMENT

COMPANY INFORMATION		
Business Name:	Contact Name:	
Business Address:		
City:	State:	Zip:
Email:	Phone :	Fax:
Primary Contact Information:		
Primary Contact Name:		
Mobile Phone:	Email:	

CERTIFICATION(S) & EXPERIENCE		
My company maintains all required state, local, or governmental licenses, certifications and/ or training and conform to all building codes related to the HVAC trade in Arkansas.	☐ Yes	☐ License Copy is Attached
INSURANCE:		
Comprehensive General Liability ($1,000,000 or more)	☐ Yes	☐ Insurance Copy is Attached

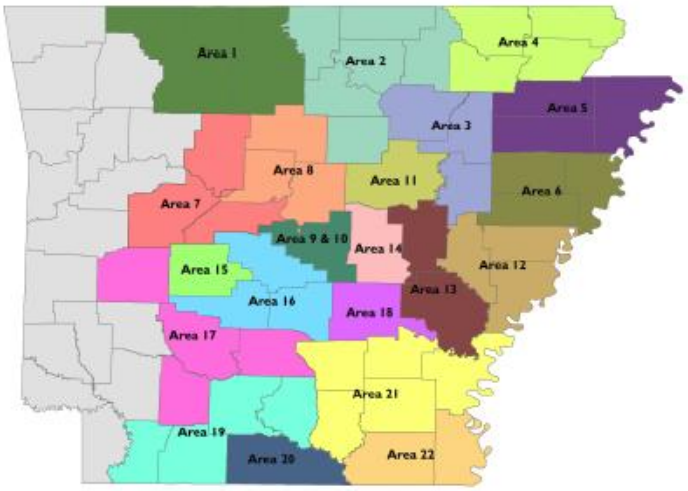
TRAINING	
I understand that I must do the following in order to fulfill my requirements to this program, prior to issuing any CoolSaver coupons, measures or commissioning:	
All technicians must complete CoolSaver Qualified Technician Training	☐ Yes
CoolSaver Toolkits must be purchased and used by CoolSaver Qualified Technicians	☐ Yes

BUSINESS CAPABILITY		
I confirm that I have the following to demonstrate business capability:		
☐ Satisfactory Dun and Bradstreet Rating	DUNS ID:	
Or at least TWO of the following:		
☐ Banking reference*	☐ Three professional/trade references*	☐ Principals of Company have satisfactory credit score/no outstanding liens/judgments*
** Use table below to complete required reference or principal information*		
Banking Reference:		
Email:	Phone:	
Address:		
Reference/Principal Name 1:		
Email:	Phone:	
Address:		
Reference/Principal Name 2:		
Email:	Phone:	
Address:		
Reference/Principal Name 3:		
Email:	Phone:	
Address:		

AGREEMENT:		
By endorsing below, you (Contractor) acknowledge that all the above information supplied is correct and accept this agreement with the CoolSaver Program sponsored by Entergy Arkansas, Inc. and implemented by CLEAResult. The signatory for this agreement maintains that they have the full authority to commit to the terms and requirements outlined in the "CoolSaver Contractor Program Manual."		
Printed Name:	Signature:	
I acknowledge that I have received and read the CoolSaver Contractor Program Manual:	Initials:	Date:

CoolSaver© Contractor Agreement FINAL, Reverse

We need to get an accurate account of what area you will service within the Entergy AR service territory below. This information will be provided to potential customers, therefore it must be accurate. You can change your service coverage area later by contacting CLEAResult.



Using the table below, please indicate in which cities you plan to conduct business by marking the left column:

☐	Area 1	Alpena, Bergman, Berryville, Bull Shoals, Diamond City, Everton, Flippin, Gilbert, Green Forest, Harrison, Lead Hill, Leslie, Marshall, Omaha, Peel, Pindall, Pyatt, Saint Joe, Summit, Valley Springs, Western Grove, Yellville
☐	Area 2	Ash Flat, Big Flat, Calico Rock, Cherokee Village, Cotter, Drasco, Fifty Six, Gassville, Hardy, Heber Springs, Highland, Mammoth Spring, Mountain Home, Mountain View, Onia, Pangburn, Timbo, Williford
☐	Area 3	Augusta, Bald Knob, Batesville, Bradford, Cash, Cave City, Charlotte, Concord, Cord, Cushman, Desha, Diaz, Floral, Gregory, Grubbs, Guion, Judsonia, Locust Grove, Magness, Marcella, McCrory, Melbourne, Mount Pleasant, Newark, Newport, Oil Trough, Patterson, Pleasant Plains, Rosie, Russell, Sage, Salado, Sidney, Sulphur Rock, Swifton, Tuckerman, Tupelo
☐	Area 4	Alicia, Almyra, Amorel, Biggers, Black Oak, Black Rock, Blytheville, Caraway, College City, Corning, Crocketts Bluff, Datto, DeWitt, Dell, Gillett, Gosnell, Greenway, Hoxie, Imboden, Knobel, Lake City, Leachville, Luxora, Manila, Marmaduke, Monette, Peach Orchard, Pocahontas, Portia, Powhatan, Ravenden, Rector, Reydell, Reyno, Saint Charles, Saint Francis, Success, Tichnor, Walcott, Walnut Ridge
☐	Area 5	Bassett, Bay, Bono, Cash, Cherry Valley, Driver, Dyess, Etowah, Fisher, Frenchman Bayou, Gilmore, Harrisburg, Hickory Ridge, Joiner, Jonesboro, Keiser, Lepanto, Marked Tree, Osceola, Trumann, Turrell, Tyronza, Waldenburg, Weiner, Wilson
☐	Area 6	Brickeys, Clarkedale, Colt, Crawfordsville, Earle, Edmonson, Forrest City, Heth, Hughes, Madison, Marion, Palestine, Parkin, Proctor, Vanndale, West Memphis, Widener, Wynne
☐	Area 7	Appleton, Atkins, Belleville, Briggsville, Centerville, Danville, Dardanelle, Dover, Gravelly, Havey, Havana, Hector, London, Ola, Plainview, Pottsville, Rover, Russellville
☐	Area 8	Center Ridge, Conway, Damascus, El Paso, Enola, Greenbrier, Hattieville, Maumelle, MayFlower, Morrilton, Mount Vernon, North Little Rock, Plumerville, Solgohachia, Springfield, Vilonia, Wooster
☐	Area 9	West Little Rock
☐	Area 10	Little Rock, Wrightsville
☐	Area 11	Beebe, Cabot, Georgetown, Griffithville, Higginson, Kensett, McRae, Searcy, West Point
☐	Area 12	Aubrey, Barton, Clarendon, Cotton Plant, Crumrod, Elaine, Goodwin, Helena, Holly Grove, Hunter, La Grange, Lambrook, Lexa, Marianna, Marvell, Mellwood, Moro, Oneida, Poplar Grove, Snow Lake, Turner, Wabash, West Helena, Wheatley
☐	Area 13	Allport, Altheimer, Biscoe, DeValls Bluff, Des Arc, , Hazen, Roe, Stuttgart, Tollville, Ulm, Wabbaseka
☐	Area 14	Carlisle, Coy, England, Jacksonville, Keo, Lonoke, Scott, Sherrill, Sherwood
☐	Area 15	Bonnerdale, Buckville, Fountain Lake, Hot Springs, Hot SpringsVillage, Jessieville, Mountain Pine, Pearcy, Royal
☐	Area 16	Alexander, Bauxite, Benton, Bryant, Carthage, Donaldson, Friendship, Haskell, Malvern, Poyen, Prattsville, Traskwood
☐	Area 17	Amity, Antoine, Arkadelphia, Bismark, Blevins, Bluff City, Bonnerdale, Caddo Gap, Caddo Valley, Delight, Emmet, Glenwood, Gurdon, Mount Ida, Norman, Oden, Okalona, Pencil Bluff, Pine Ridge, Prescott, Sims, Sparkman, Story
☐	Area 18	Grady, Hensley, Jefferson, Moscow, Pine Bluff, Redfield, Sheridan, White Hall
☐	Area 19	Bearden, Buckner, Camden, Chidester, Emerson, Fordyce, Kingsland, Lewisville, Magnolia, McNeil, New Edinburg, Rison, Stamps, Stephens, Taylor, Thornton, Village, Waldo
☐	Area 20	Calion, El Dorado, Huttig, Junction City, Louann, Mount Holly, Norphlet, Smackover, Strong, Urbana
☐	Area 21	Arkansas City, Dumas, Gould, Grady, Hermitage, McGehee, Mitchelville, Monticello, Pickens, Tillar, Warren, Wilmar, Winchester
☐	Area 22	Boydell, Crossett, Dermott, Eudora, Hamburg, Lake Village, Montrose, Parkdale, Portland, Wilmot

CoolSaver© Training Process FINAL

CoolSaver© Technician Training and Qualification Process

Steps to Becoming a Qualified CoolSaver Technician:

Only qualified technicians are eligible to complete CoolSaver A/C Tune-ups & submit for payment

☐ **STEP 1:** Contracting company must have submitted a signed participating contractor agreement, along with a copy of Arkansas HVAC License and proof of $1M liability coverage.

☐ **STEP 2:** Contractor must have the program-required toolkit or approved alternative components.

☐ **STEP 3:** Technicians attending trainings must have valid Refrigeration Handling Certification.

☐ **STEP 4:** The above must be in place in order to attend Technician Training. Training classes are one full-day (8:00 a.m.-4:00 p.m.) in selected training facilities around the state. After scheduled classes are over for the season, some individual or small group trainings may be arranged with the program trainer on-site at your location or other convenient locations.

☐ **STEP 5:** Technician must demonstrate: competency and understanding for proper deployment of measuring devices and program-required toolkit, program data gathering and documentation, refrigerant charging procedures, incentive structure and customer eligibility requirements.

☐ **STEP 6:** Upon completion of all of the above steps, the technician will be assigned a technician qualification number. This number serves as a unique identifier of all tune-ups completed and submitted by that technician. The qualification number is valid for the remainder of that program year, provided that the technician and the company remain in good standing regarding the collection and submission of data, and the outcome of quality control inspections and any required remedial actions.

☐ **STEP 7:** Qualified technicians may use "unqualified" helpers to assist when cleaning condensers, coils, blowers, and filters and transporting tools, equipment, and refrigerant on the job site. However, the qualified technician must be ultimately responsible for the quality and thoroughness of the work performed, and must verify that the cleanings are complete and correctly done. *The qualified technician must take all measurements, is held responsible for accurate data collection and recording, and must personally measure and adjust refrigerant charge.* By submitting the tune-up for review and approval, the qualified technician is warranting that the work was performed to program standards and that all data was recorded correctly.

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CoolSaver© Invoice Instructions FINAL (2)

CoolSaver Invoice Completion

In order to smoothly process tune-ups and expedite payment, you MUST follow the protocol below. Every CoolSaver Invoice MUST include:

- Complete **project numbers** for all tune-ups on the invoice (For example: Cool5187_2013_04_11_02).
- The correct **customer name**, complete **service address** (may be different from the billing address) including city, state & zip, **contact person** and **phone number**.
- The correct incentive (coupon) **dollar amount** for each tune-up must be indicated right after the project number.

  Project: Cool5187_2013_04_11_02 **$175= All Residential / Commercial Up To 5 Tons**
  Project: Cool5187_2013_04_11_03 **$200= Commercial 6 Tons or larger**

  The dollar amount at the end of the line is NOT a place for your total charge.

- List your **total charge** including tax, refrigerant and additional services for all tune-ups in the box where it says *Contractor Invoice Amount*.
  - Subtract the sum of all the incentives.
  - Put the Customer Net Cost in the bottom line.
  - Do not list Tax as a separate line item.
- Customer signature is required. If you have the customer's signature on another invoice then check the box and write a project number for reference
- **FIELD DATA COLLECTION SHEETS MUST BE FAXED OR SCANNED IN AT THE SAME TIME AS INVOICES.**
  - All technician and customer information must be completely filled in on each Field Data Sheet.
  - Project number must be written in upper right space.
  - All required technical data fields must be filled in legibly.
  - If anything is out of range, a note is to be written in the margin explaining the issue.

Entergy Customer	
Contractor Invoice Amount (Sum of all tune-up charges plus tax)	$225
Blower Professionally Cleaned	✔
Professionally Clean Evaporator Coil	✔
Refrigerant Charge Adjusted	✔
Less Total Entergy Incentive Amount	-$175
Customer Net Cost	$50

Again, before we can begin processing tune-ups for payment, you must submit BOTH the CoolSaver Invoice and a Completed Field Data Sheet simultaneously for each tune-up.

FAX to 1-866-401-5383
Scan and email to entergy-coolsaver@clearesult.com

All Invoices and Field Data Sheets must be submitted before 6 a.m. Monday.
Anything received after 6 a.m. Monday will be processed the following week.
Following these procedures will help ensure that you will be paid as quickly as possible.

CoolSaver | Entergy Solutions

CoolSaver© Processing & Payment Procedures

CoolSaver©
A/C Tune-up Processing and Payment Procedures

Things You Can Do to Shorten Your Payment Processing Time:

1. Submit complete and accurate tune-up data files before 6 a.m. on Mondays.
2. FAX or scan-in and email your CoolSaver Invoice to entergy-coolsaver@clearesult.com as soon as you upload the tune-up data file. Make sure the correct project numbers are on the invoice, the math is correct and you have at least one invoice per project with a valid customer signature.
3. Make sure that you have the exact customer name on the account, accurate Entergy account number, meter number, service address and contact person /contact info. Perform the tune-up to program standards, gather accurate data and measurements, leave the system with good airflow and properly charged to Superheat/Subcool.
4. Respond quickly if you receive an email from us regarding missing invoices, invoice error or customer not verified.

Processing Rules of the Road: Follow These Rules if You Want to Get Paid

1. Data collected on-site must be entered into the CoolSaver Data Collection and Verification Form in order to be uploaded to CLEAResult for processing.
2. Tune-ups uploaded by 6 a.m. on Monday are downloaded for processing and payment that week.
3. Any tune-ups uploaded after 6 a.m. on Monday are not downloaded for processing until the following Monday.
4. Processing involves the following steps:
   - Verification that a contractor invoice has been submitted for the tune-up project number.
   - If no invoice has been submitted, processing stops and an email notice is sent to the contractor.
5. Verify that the contractor invoice is correctly completed (customer charge equals or exceeds the incentive amount; incentive amount is correct for the measures performed and the tonnage of the system; the math is right for the number of projects on the invoice, customer signature is captured, etc.)
   - If there are invoice errors, processing stops and an email notice is sent to the contractor.
6. Verify that it is not a "duplicate" tune-up (performed on the same air conditioner in less than 5 years)
   - If it is a duplicate, processing stops and additional verification is obtained. If duplicate is verified, the tune-up is permanently rejected, and will not be paid. This is why properly dated CoolSaver stickers are mandatory.
7. Verify the customer account is an active Entergy customer, using the name, service address, utility account number and/or meter number.
   - If the customer cannot be verified, processing stops and an email notice is sent to the contractor requesting additional particular information.
8. Tune-ups passing all of the above verifications are sent to engineering review, during which, approximately 40 fields of technical data are reviewed for accuracy and reasonableness.
   - If a tune-up fails engineering review, it is placed in "field follow-up" and the technician is contacted by program staff to determine if data was collected incorrectly, tools are out of calibration, there were errors entering the data, or what may have caused failure of Engineering Review.
   - Occasionally, data fields have to be corrected due to mistakes by technicians. A "field follow-up" usually results in a "permanently rejected" project or "field follow-up complete," which allows the tuneup to proceed to "approved by Engineering."
9. Tune-ups passing all of the above verifications will be batched for approval to pay.
10. At that time, a random sample of 10 percent of tune-ups for each technician are selected for on-site Q/A inspections and moved into "Q/A on-hold" category. These are scheduled with the customer for an on-site Q/A inspection. Passing this inspection moves the tune-up to payment processing.
    - Failure of the Q/C inspection results in a "stop-payment" of ALL of your projects until corrections have been made, re-inspected and verified. We will email you if a certain tune-up has failed Q/C inspection, specify the project number and communicate the remediation requirements. It will be up to you to schedule your next visit with the customer in the manner you prefer.
    - Notify us when the required remediation is complete so we can schedule a re-inspection to verify that the work has been completed to program requirements. Upon a "pass," payment will begin again.
11. Checks are processed on Fridays and mailed by normal USPS delivery methods.

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Avoiding Duplicate Project Numbers

Avoiding Duplicate Project Numbers

Reason duplication happens:

Project numbers are created by the application based on 1) the technician's qualification number, 2) date of tune-up and 3) number of tune-ups completed on that date.

Duplication in project numbers may occur if a technician submits projects from the same day to different data entry administrators. For example:

1. John Doe completes two projects on 4/8/2013. If one project were entered by Admin 1, while the other project is entered by Admin 2, then both project numbers would be *Test 1234_2013_04_08_01*.
   - This happens because Admin 1's computer can't see Admin 2's computer (and vice versa), so neither computer has a record of this number being used.
2. If both of the projects are entered by Admin 1, the project numbers would be *Test 1234_2013_04_08_**01*** and *Test 1234_2013_04_08_**02*** because Admin 1's computer will recognize that *Test 1234_2013_04_08_01* was already been claimed by the first project entered.

Solution:

Only **ONE** computer can be used to enter tune-ups done by the **SAME TECHNICIAN** on the **SAME DAY**.

Multiple administrators may be used to enter tune-ups into the DCVF; however, duplications can be avoided by dividing projects by either **TECHNICIAN** who performed the tune-up, or by **DATE** on which the tune-up was completed.

Tune-up Project Date:

Please remember to make the correction to the TUNE-UP PROJECT DATE box. This box will automatically populate with the date that you are entering the data. However, you can change it to the actual date that the tune-up was performed by clicking on it. It is very important that all tune-up completion dates are entered accurately. Please remind technicians to write the actual date of the tune-up on their Field Data Sheets.

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Business Models for Success FINAL

Tips for Integrating the CoolSaver© A/C Tune-up Program into your Business Model

Here are some strategies that contractors have used to make the Entergy Arkansas CoolSaver® A/C Tune-up Program a valuable part of their business. We hope that these tips will help you formulate an integration plan that fits your particular organization and customer base.

- **Offer incentives to your regulars.** Let your regular customer base know that you now offer the Entergy CoolSaver® A/C Tune-up. You might offer them a CoolSaver tune-up either free, as an addition to a semi-annual check-up or at a greatly reduced price. Schedule these free tune-ups during your least busy times in order to increase profitability by keeping your technicians fully deployed.

- **Piggy-back CoolSaver onto your existing maintenance customer base.** Between January and March, offer pre-cleanings that can be tested as soon as temperatures hit 70 degrees or more. Technicians without CoolSaver qualifications can help with the pre-cleanings, as long as they clean them to your specifications. Then, CoolSaver-certified technicians can follow behind, verifying cleanings and conducting tests. Continue this cleaning-and-testing cycle into the spring.

- **Use CoolSaver to recruit new commercial customers.** Bring your new customers' systems up to snuff by offering a free CoolSaver tune-up to commercial customers who sign a regular maintenance agreement. This will help identify system problems and inadequacies at the beginning of the agreement, reducing the likelihood of surprise breakdowns. Additionally, you'll generate revenues from identified repairs.

- **Use CoolSaver to recruit new residential customers.** Offer your customers the option of displaying a CoolSaver sign in their yard after you perform a tune-up. For additional visibility, leave door hangers on homes in the surrounding neighborhood. You can also promote CoolSaver by working with Neighborhood Associations. These organizations often provide leads that you can use to secure a large volume of CoolSaver business within a specific neighborhood. Every time you do a tune-up, put up another yard sign!

- **Look for production models.** Identify geographic areas with a high density of schools, strip malls, property management firms, housing authorities or other properties that would be eligible for a CoolSaver tune-up. Then, assemble two-person teams to drive out to these areas and complete several tune-ups per region.

- **Be a one-person show.** Make a commitment to do one CoolSaver tune-up per technician, per day. Schedule the tune-up to be the first stop each day, and run other calls the rest of the day. This strategy works well for small shops or for selected technicians in larger companies; and it will get you 5 tune-ups per week, 20 per month, and 100-120 per technician each season. Do the math. One-a-day keeps the doctor away!

- **Grow your junior staff into lead CoolSaver technicians.** Let junior technicians clean and prepare systems under the close supervision of experienced CoolSaver-Qualified Technicians, who remain responsible for data gathering and charging. By watching and getting feedback from senior technicians, junior staff without CoolSaver qualifications will begin to understand the program and learn how to adjust refrigerant charges using the program tools.

- **Work with community organizations.** Offer to do CoolSaver tune-ups for a church, chamber of commerce or property management firm. After seeing the value of the service, these organizations will often be willing to work out a plan for you to offer tune-ups to congregations, employees, members or clients.

- **Work with hardware stores.** Because CoolSaver tune-ups require customers to purchase a new air filter, many hardware stores can be persuaded to promote your program as a way to increase filter sales. Performing a tune-up for the owner or manager of a local hardware store can be a good way to show how valuable the service is. This will make it easier for hardware store management to promote CoolSaver by displaying your program's trifold brochures at the cash register and telling customers that they need to purchase a replacement filter before you show up for your appointment. Word gets around! This is especially true in small towns or small shopping areas.

- **Recommend CoolSaver tune-ups.** Train all of your technicians to talk to customers about the benefits of a CoolSaver tune-up and to arrange for your dispatcher to call each customer soon after the initial visit. By doing this, you can use all of your technicians to funnel leads to one or a few CoolSaver specialists. Even if you are too busy to get to the tune-ups right away, it will be business that you can cash in on as soon as your schedule opens up.

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CoolSaver© Program Required Toolkit

Program-required ToolKit

The program relies on many measurements to quantify the savings delivered via program activity. Specific toolkits are required in order to help ensure uniform, high-accuracy measurements and quality work by all participating contractors and technicians. Neither Entergy Arkansas nor CLEAResult profit from the sale of these toolkits.

Toolkits are available online, by phone from TruTech Tools and at participating local Supply Houses, including certain branches of Ed's Supply, R & E Supply and Sanders Supply.

CoolSaver® Program Required Toolkit contents

- Testo Digital A/C Refrigerant Analyzer.
  - Auto-calculates Superheat and Sub-cooling for over 30 refrigerants, plus condensing and evaporating temperatures.
  - Eligible models include 550, 557 or 570.
- 2-Spring clamp temperature probes matched to the A/C Analyzer.
  - Carrying case for Analyzer with room for hoses.
- Refrigeration hose set.
  - 5' Yellow Jacket PLUS II™ 1/4" w/Compact Ball Valve End.
- Testo model 417 Large Vane Anemometer with carry case.
- 3 units: Testo 605-H2 Humidity Stick with Wet Bulb reading.
- Testo model 510 compact manometer for static pressure tests, etc.
- 2 units: magnetic static pressure tips for air pressure measurements, with accompanying hoses and fittings.
- Videoscope with 36" probe and 3/8" diameter head (preferred maximum; ½" head acceptable) for inspecting inside evaporator coils; includes carrying case.

If you already have some of the contents, you will only have to purchase the items you need to complete the kit.

- Purchase the videoscope brand of your choice (it must good resolution and lighting for inspecting inside evaporator coils).
- All other components must meet the specified brand requirements.
- There are three choices in terms of the Testo Refrigerant Analyzer - Model 550, Model 557 and Model 570. You only need one of these.

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Contractor Business Card Template

CoolSaver© Contractor Card

CoolSaver© Contractor Flyer 3 piece

SCHEDULE YOUR FREE A/C TUNE-UP WITH ME TODAY!

As a participating contractor in the Entergy Arkansas Energy Efficiency Programs, I can offer customers a no-cost, high performance CoolSaver® A/C Tune-up.

With a CoolSaver A/C Tune-up, you'll enjoy:

- Increased cooling & system efficiency
- Improved comfort
- Lower energy bills
- Extended equipment life
- Improved reliability

CoolSaver™

Call today to schedule your free CoolSaver A/C Tune-up!
Please have your Entergy Arkansas account number available when calling to schedule. This flyer is not required for offer redemption.

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CoolSaver™

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CoolSaver© Car Magnet

CoolSaver© Business Window Cling FINAL

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CoolSaver© Truck Magnet Black FINAL

CoolSaver©

A/C Tune-up

Participating Contractor

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CoolSaver© Truck Magnet Blue FINAL

CoolSaver©

A/C Tune-up

Participating Contractor

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CoolSaver© Marketing Resources

CoolSaver© Marketing Resources, Policies and Strategies

Content:

1. Suggested phone crew scripts.
2. Contractor recruiting one-pager.
3. Snapshot page of individual marketing collateral pieces.
4. Two categories of marketing pieces:
   a. Free to you (provided by the program upon request).
   b. Available for you to print at your own expense, customize with your company information upon request; already approved by Entergy with Entergy branding.
5. Entergy Solutions participating contractor guidelines, logo guidelines.
6. Entergy-branded contractor photo ID badges.
7. Residential fact sheet.
8. Commercial fact sheet.
9. Residential/commercial customer brochure.
10. Commercial case study.
11. Commercial project summary promo piece.
12. Sample project summary cover sheet.

Contact:

- Requests for program-provided marketing pieces.
- Requests for marketing templates, Entergy-branded materials for printing or customizing purposes.
- Questions about what you can/cannot say or print.
- If you anticipate placing an ad.

For any of these requests, contact:
Greg Ballard, Marketing Manager
501-221-4022
greg.ballard@clearesult.com

Phone Staff and Technician Talking Points:

A CoolSaver A/C Tune-up includes the following:

- Clean outdoor condensing coils.
- Clean indoor evaporator coils.
- Clean indoor blower.
- Measure and verify indoor airflow; adjust as necessary to specifications.
- Measure and adjust the refrigerant with digital accuracy.
- Measure the final cooling capacity in tons and the efficiency.
- Provide a customer report of estimated savings.
- Entergy covers $175 of the cost of the tune-up.

CoolSaver© Marketing Resources, Page 2

CoolSaver

Continued - Phone Staff and Technician Talking Points:

1. **To tag on a CoolSaver Tune-up to a seasonal maintenance visit:**
   - I am calling to schedule your semi-annual maintenance visit, but I also have some exciting news for you! As a participating contractor for Entergy Arkansas' CoolSaver A/C Tune-up Program, I am trained and qualified to ensure your system is operating at maximum efficiency.
   - Entergy covers most or all of the costs associated with an in-depth cleaning and fine-tuning of your system. This service increases your air conditioner's efficiency and cooling ability by 25 to 30 percent on average. Keep in mind, many of these activities not covered by your standard seasonal check-up.
   - We use state-of-the-art digital measuring instruments.
   - Entergy offers $175 off the cost of a CoolSaver A/C Tune-up for EACH ONE of your air conditioners. Because this rebate just about covers the additional time and materials for us, we are offering the extra service at no additional cost to our regular maintenance contract-holders.
   - Would you like to take advantage of this opportunity to increase your A/C performance, reduce your Entergy bill and decrease the risk of future system breakdowns?

   Questions to anticipate:

   Q: What extra work is involved?

   A: Cleaning the indoor coil and blower, testing and adjusting airflow, and adjusting refrigerant using digital technology – which is 10 times more accurate.

   Q: How much longer will this take than your normal check-up?

   A: Usually about an hour longer, depending on the accessibility and dirtiness of your equipment. Rarely ever more than an hour and a half. (Or decide on your answer based on your knowledge.)

   Q: Why is Entergy doing this? Don't they want to sell electricity?

   A: Yes, they do, but this is one way to help Entergy meet the high demand for electricity on the hottest days. That helps them plan for their peaks.

2. **To tag on a CoolSaver Tune-up to an emergency "No-cool" call:**
   - I have found the problem and corrected it, but I see some significant issues with your system that could be corrected to help your system run more efficiently, provide you with more cooling and save you some energy dollars.
   - Beacause you are an Entergy customer, Entergy will help pay for a major part of the service – it's called a CoolSaver A/C Tune-up. I am a participating contractor for the program, qualified and trained to perform the service.

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CoolSaver© Marketing Resources, Page 3

CoolSaver

Continued - Phone Staff and Technician Talking Points:

- Typically, a CoolSaver tune-up makes your A/C system about 25 to 30 percent more efficient and increases its ability to cool your home. Would you like to take advantage of that? (Reference above speaking points if necessary.)

3. To plant a seed while on a "No-cool" for a follow-up CoolSaver Tune-up:

- I have found the problem and corrected it, but I see some significant issues with your system that could be corrected to help your system run more efficiency, provide you with more cooling and save you some energy dollars.
- Beacause you are an Entergy customer, Entergy will help pay for a major part of the service – it's called a CoolSaver A/C Tune-up. I am a participating contractor for the program, qualified and trained to perform the service.
- Typically, a tune-up makes your A/C system about 25 to 30 percent more efficient and increases its ability to cool your home. Would you like to take advantage of that? (Reference above speaking points if necessary.)
- If Yes, explain that we are currently swamped with "No-cool" calls and will have our dispatcher give you a call to schedule the service as soon as we can work it in. (Reference above speaking points if necessary.)

4. To help sign-up a new maintenance agreement:

- Have you heard about our regular maintenance plan? The benefits include [list your company's benefits]. Not to mention, we will include an Entergy CoolSaver A/C Tune-up at no addition cost. This service includes cleaning the indoor and outdoor coils, cleaning the blower, measuring, verifying and adjusting airflow, and adjusting the refrigerant with digital accuracy.

  OR:

- The best thing we can do for your system is perform a CoolSaver A/C Tune-up, which includes cleaning the indoor and outdoor coils, cleaning the blower, measuring, verifying and adjusting airflow, and adjusting the refrigerant with digital accuracy.
- We normally charge [$##] for that service; however, if you sign up for a maintenance agreement, we will include the CoolSaver A/C Tune-up at no additional cost.

5. To re-sign-up a lost maintenance agreement:

- Offer to perform the CoolSaver A/C Tune-up for them at no-cost if the customer re-signs a maintenance plan.

CoolSaver© Marketing Resources, Page 4

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Generic Marketing Pieces Available for Your Use

Category 1:

The program will provide – at no cost to you, upon request – the following pieces for your use:

1. **Residential / Commercial Tri-fold Brochure**

   You can add your company card or sticker in the space designated on the back panel. These are good "talking pieces" or handouts.

2. **Residential and Commercial Fact Sheets (8.5" x 11")**

   "Just the facts!" Lists eligible customers and equipment, incentive dollar amounts, items included in the tune-up, benefits and contact information.

CoolSaver© Marketing Resources, Page 5

CoolSaver

Continued - Generic Marketing Pieces Available for Your Use

3. **Case Studies**

Detailed accounts of successfully completed CoolSaver projects, including a project summary, savings achieved and incentive amounts.

4. **Project Summary for Commercial Customers With Multiple Units**

Explains the benefits of having all of units "tested-out" after having a CoolSaver A/C Tune-up performed, allowing customers to identify the least efficient systems and start budgeting to replace them.

CoolSaver© Marketing Resources, Page 6

CoolSaver®

Continued - Generic Marketing Pieces Available for Your Use

Category 2:

Pre-designed, Entergy-branded collateral that you may print at your expense. Upon request, you may customize pieces with company name and info. We will provide approved art for your printer upon request.

1. **Technician and Sales staff "Entergy-branded CoolSaver Business Cards"**

   Side 1: Includes your contact info, the Entergy and Entergy Solutions logos, and states, "Contact me, your Entergy Solutions Program-Qualified Technician."

   Side 2: Includes CoolSaver logo, states, "I can help lower your energy bills and extend the life of your air conditioner with the Entergy Arkansas CoolSaver Program," and lists the customer benefits of having the tune-up performed, including the incentive dollars.

Customize!

2. **Magnetic Entergy CoolSaver-branded Truck Signage**

   Designed for a 12" x 16" space.

CoolSaver© Marketing Resources, Page 7

CoolSaver

Continued - Generic Marketing Pieces Available for Your Use

3. **Yard Signs**

Print your company name and number to add as a "sign-topper."

4. **Door Hangers**

"Your Neighbor Just Earned $175 in Instant Discounts." Print your company contact info on the back, place in neighborhoods where you have served happy CoolSaver customers or are seeking new customers.

CoolSaver© Marketing Resources, Page 8

CoolSaver

Continued - Generic Marketing Pieces Available for Your Use

5. **Print ads and Post Cards**

Entergy-branded. Add your company contact info. Photos can be changed.

Customize!

6. **Tune-up Coupons for Hand-outs**

Add your company contact info. Hand out to customers, place at hardware stores, restaurants, laundromats, civic events, etc.

Customize!

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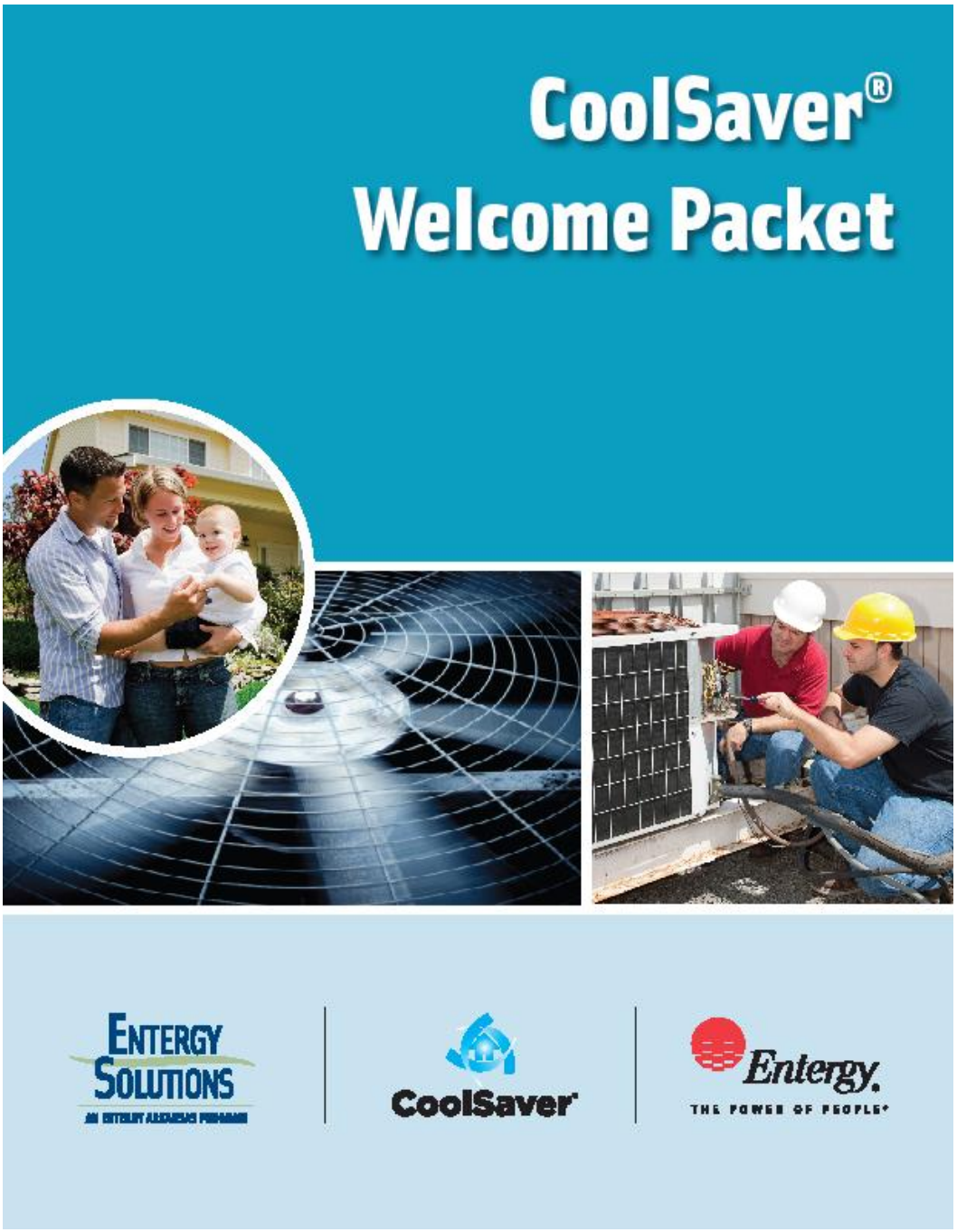
CoolSaver© Welcome Packet Cover



2.3 Small Business

Small Business Fact Sheet

FACT SHEET: 2013 Small Business Program

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The Small Business Program helps small businesses achieve significant, long-term electricity savings through the use of local contractors. Participating contractors will help small business customers like you analyze your facility's energy use, identify energy efficiency improvement projects and install cost-effective energy-saving measures. Program participants may receive no-cost energy assessments and direct installed measures, including low-flow aerators and pre-rinse spray valves (electric water heat customers only), CFLs and vending misers, as well as rebates for eligible energy efficiency measures that are installed in their business.

The Small Business program will help you:

- Improve the efficiency and performance of your facility.
- Achieve significant, long-term energy savings.
- Earn incentives to help offset the cost of energy efficiency upgrades.

Who is Eligible?

Small commercial and industrial customers with:

- A valid Entergy Arkansas account number.
- Less than 100 kW peak demand.

What are the Benefits?

- Financial incentives.
- Reduced energy costs.
- Walk-through energy assessment.
- Access to Participating Contractor network.

How Does the Program Work?

Please follow the steps below to participate:

1. Contact the Energy Efficiency Solutions Center at 877-212-2420 to be assigned a participating contractor.
2. Participating contractor will contact you to schedule a no-cost walk through assessment of your facility to identify low-cost energy savings measures.
3. Upon your approval, participating contractor will install savings measure.
4. You receive instant rebates from the participating contractor for the installed measure.

Program Incentives

The most common measures are listed below:

Small Business Solutions Incentive Matrix (per kWh)			
Lighting	$0.21	Refrigeration	$0.50
Lighting Controls	$0.21	Duct Sealing	$0.35
Direct Install	Full Cost	Ceiling Insulation	$0.35
Window Film	$0.35		

Note: Project incentives will be capped at 75% of the total incremental project cost.
Any additional measures approved by the program will be paid at a rate of $0.21 per kWh.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/smallbusiness.**

Small Business Fact Sheet, Reverse

2013 Small Business Program Eligible Measures

Measure Type	Measure Description
Lighting Retrofit	Lighting retrofit projects replace inefficient lighting systems with more efficient lighting systems. A variety of high efficiency fixtures, ballasts and lamps produce equivalent light levels as previous technologies while consuming less energy. For instance, T12 fluorescent lamps and magnetic ballasts can be replaced with more efficient lighting systems such as T8 fluorescent lamps with electronic ballasts. Metal halides may be replaced with systems such as T5 fluorescent lamps with electronic ballasts or compact fluorescents. There are a variety of lamp and ballast combinations that are eligible for this program depending on the current technology installed at a facility.
Lighting Controls	Automatic lighting controls save energy by turning off or dimming lights when they are not necessary. Many different varieties of sensors are available including passive infrared, dual-technology, integral occupancy sensors, photocells, which can be coupled with a variety of control strategies including day lighting controls, occupancy controls timer controls, and time clocks. For certain conditions, light reduction and automatic controls are mandatory for new construction and affected retrofit projects.
Exterior Lighting	Energy saving opportunities exist for all major exterior lighting applications including parking lots, streets and roadways, and other building mounted lighting. Energy saving opportunities applies to both improved lighting performance and enhanced control strategies. For example, retrofitting less efficient high intensity discharge technologies with light emitting diode lighting and occupancy-based technology are good candidates for exterior applications.
Window Film	Specialized window film can help block solar heat gain in a facility and reduce cooling loads. For this program, window film may be applied to the inside of glazing on the east and west windows of commercial buildings less than 15,000 gross square feet (any direction except 45 degrees of true north). Windows must not be shaded with existing awnings or shading devices, and window film must be installed in space conditioned by refrigerated air conditioning to qualify in the program.
Refrigeration	There are a number of refrigeration measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Night covers on refrigeration cases. • Evaporator fans.
Kitchen Upgrades	There are a number of kitchen measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Pre-rinse spray valves. • Energy efficient dishwasher. • High efficiency electric combination ovens. • High efficiency fryers. • ENERGY STAR® insulated holding cabinet. • ENERGY STAR refrigerator. • ENERGY STAR freezer. • ENERGY STAR convection oven. • ENERGY STAR steam cookers.
Ceiling Insulation (Converted Residences Only)	Existing businesses with insufficient levels of insulation have the opportunity to increase the insulation R-value to R-30. Insulation savings and incentive amounts are based on a per square foot of treated ceiling area.
Duct Sealing (Converted Residences Only)	Duct sealing will seal leaks that exist in supply and return ducts of existing homes. Duct pressurization or a blower door test is required before and after the measure installation. Only pre-approved sealing materials will be allowed by the Program.
HVAC Replacement	For existing buildings and new construction, non-ENERGY STAR qualified heat pumps and air conditioning units are eligible to be replaced with ENERGY STAR qualified units. Eligible units for replacement include small split system and single package air conditioners and heat pumps.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/smallbusiness.

Small Business Trifold

Available Incentives

Entergy Arkansas offers the following incentives to help offset the cost of your energy efficiency improvement projects:

Small Business Program Incentive Matrix (per kWh)	
Lighting	$0.21
Lighting Controls	$0.21
Direct Install	Full Cost
Window Film	$0.35
Refrigeration	$0.50
Duct Sealing	$0.35
Ceiling Insulation	$0.35

Note: Project incentives will be capped at 75% of the total incremental project cost. Any additional measures approved by the program will be paid at a rate of $0.21 per kWh.

Eligible Measures

- Lighting retrofit.
- Lighting controls.
- Exterior lighting.
- Window film.
- Refrigeration.
- Kitchen upgrades.
- Ceiling insulation. (Converted residences only)
- Duct sealing. (Converted residences only)
- HVAC replacement.
- Direct Install Measures.

Start Saving Today!

For more information about the program, call 877-541-3047 to speak with a program representative or visit our website: entergyarkansas.com/smallbusiness.

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AN ENTERGY ARKANSAS PROGRAM

Ready to get started? Speak with your Small Business Program Specialist today:

Ashley Scott
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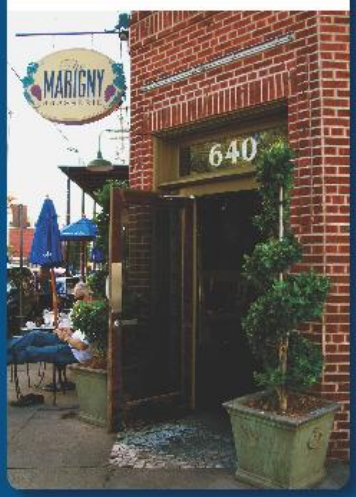
You Have the Power to Lower Your Entergy Bill.

Put more savings back into your business with the Entergy Arkansas Small Business Program!

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM



Small Business Trifold, Reverse

The Small Business Program helps customers achieve significant, long-term energy savings.

How Does the Program Work?

Our participating contractors help small business customers like you analyze your facility's energy use, identify energy efficiency improvement projects and install cost-effective energy-saving measures.

Program participants may receive no-cost energy assessments and directly installed measures, including low-flow aerators, pre-rinse spray valves (electric water heat customers only), CFLs and vending misers, as well as rebates for eligible energy efficiency measures that are installed in their business.

What Are the Benefits?

- Financial incentives.
- Reduced energy costs.
- Walk-through energy assessment.
- Access to participating contractor network.

Who is Eligible?

Small commercial and industrial customers with:

- A valid Entergy Arkansas account number.
- Less than 100 kW peak demand.

Save More.

To further increase efficiency and energy savings, participating technicians will install natural gas, electricity- and water-saving measures at your business or facility—AT NO COST TO YOU!

These measures, which include high-efficiency spray valves, faucet aerators, CFLs and vending misers, can save you hundreds of dollars per year in energy and water costs:

- Pre-rinse spray valves save up to $750 annually.
- Low-flow aerators reduce water use in bathroom and handwashing stations by approximately 50 percent.

Let's Get Started.

Please follow the steps below to participate:

1. Contact the Energy Efficiency Solutions Center toll free at 877-212-2420 to be assigned a participating contractor.
2. Participating contractor will contact you to schedule a no-cost walk through assessment of your facility to identify low-cost energy-savings measures.
3. Upon your approval, participating contractor will install savings measure.

Typical Small Business Program project scenario:

This hypothetical example illustrates a scenario that could take place at a small office building. Simulated existing conditions and sample proposed retrofits are listed with a summary estimate of energy and cost savings below. The data given below is not necessarily indicative of what you may see at your site, but can be reviewed to understand how the program operates and its potential value.

Existing Interior Lighting	Interior Lighting Retrofit
32 2'x4', 4-lamp T12 with magnetic ballasts	32 2'x4', 2-lamp T8 with reduced light output electronic ballasts
16 60-watt incandescent downlights	16 23-watt compact fluorescent downlights
16 2'x2', 2-lamp T12 with magnetic ballasts	16 2'x2', 2 lamp T8 with reduced light output electronic ballasts
Existing Exterior Lighting	**Exterior Lighting Retrofit**
9 150-watt incandescent fixtures	9 42-watt compact fluorescent fixtures
1 150-watt high pressure sodium wall pack	1 42-watt compact fluorescent wall pack

Project by the Numbers, Under These Assumptions:

- **Total annual energy savings:** approximately 16,100 kWh.
- **Total cost:** approximately $3,900.
- **Estimated incentive:** $2,600.
- **Cost savings:** approximately $1,280.

If the business were to make these upgrades, the net cost to the customer would be $900 with a simple payback around nine months.

Small Business Flyer

Save Energy. Save Money.

By installing energy-saving devices at your business or facility, you could be saving hundreds of dollars per year in electricity and water costs.

- Pre-rinse spray valves offer the greatest opportunity for energy savings – **up to $750 annually.**
- Refrigerated drink machine controls reduce energy consumption by an average of 46 percent per machine – typically **$150 annually.**
- Faucet aerators reduce water use in hand-washing sinks by approximately **50 percent** by reducing consumption and the need to heat water.

As part of the Entergy Solutions Small Business Program, our participating technicians will install no-cost energy- and water-saving measures at your facility to help reduce energy use and increase efficiency. These measures, which include high-efficiency spray valves, refrigerated drink machine controls and faucet aerators, can save you hundreds of dollars per year in electricity and water costs – **without compromising performance.** Any small commercial and industrial customer with an Entergy Arkansas account number and less than 100kW peak demand is eligible.

Interested in participating? Contact Program Specialist, Ashley Scott, at 501-221-4010 or visit **entergyarkansas.com/smallbusiness** to learn more.

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Small Business Flyer, Reverse

Know Your Options.

Energy Efficiency Checklist

- ❑ Have you taken advantage of all direct-install options available to you?
  - Faucet aerators.
  - Refrigerated drink machine controls.
  - Pre-rinse spray valves.
- ❑ Have you evaluated the efficiency of the lighting in your facility? Our participating contractors will perform an on-site inspection and provide you with a free quote for upgrades. Entergy Arkansas could cover up to 75 percent of the cost of upgrades.
- ❑ Entergy Arkansas offers additional incentives to help offset the cost of energy efficiency improvements. Learn more about all of them at **entergyarkansas.com/your_business**.

Have You Considered?

- ❑ **Air Conditioner Tune-up:** A CoolSaver® A/C tune-up can improve the cooling output and efficiency of your air conditioning unit by up to 30 percent. Plus, you can receive $75 in instant utility discounts.
- ❑ **Window Film:** Window film is a transparent film that reduces solar heat gain in the summer and heat loss in the winter while allowing maximum visible light into the room. Entergy Arkansas will pay up to 50 percent of the cost of installation.
- ❑ **Refrigeration:** There are a number of refrigeration measures that are eligible for upgrades or replacement in Entergy Arkansas programs, including:
  - Evaporator fan upgrades to electronically commutated motors.
  - Anti-sweat heater controls.
  - Refrigerated door gaskets.

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Small Business Case Study: Three Rivers

CASE STUDY

Three Rivers Distributing Lights Its Way to Energy Savings.

PROJECT AT A GLANCE:

Total peak kW reduction:	8.77 kW
Annual kWh reduction:	49,112 kWh
Total fixtures replaced:	82
Estimated annual savings:	$3,500
Total project incentive:	$9,326
Payback period:	14 months

THE OPPORTUNITY

The Entergy Arkansas Small Business Program helps companies like Three Rivers Distributing achieve significant, long-term electricity savings through the use of local contractors and implementation of energy efficiency upgrade projects. Realizing the potential savings, Ritch Schwartz, facility manager at Three Rivers Distributing, enlisted the help of the Small Business Program team and Gilliam Electric, a local contractor.

ENTERGY SOLUTIONS
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THE PROJECTS

During an on-site walk-through assessment of the facility, the program team identified 82 outdated lighting fixtures – 69 interior and 13 exterior. To achieve maximum savings, Gilliam Electric replaced these fixtures with high-efficiency T8 lamps with low ballast factors and substituted all mercury vapor and incandescent bulbs with CFLs. Additionally, Gilliam installed lighting controls to further reduce energy use.

THE RESULTS

By replacing its inefficient lighting fixtures, Three Rivers Distributing will save about 49,112 kilowatt-hours of electricity each year – that's equivalent to eliminating the carbon emissions from the electricity use of 4.2 homes for one year, according to the Environmental Protection Agency. What's more notable is that the incentive the company earned paid for 70 percent of the total project cost, resulting in a simple payback of only one year and two months.

To learn more about how the Small Business Program can help your company, visit **entergyarkansas.com/smallbusiness.**

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/smallbusiness.

Small Business Case Study: Boys and Girls Club

CASE STUDY
Boys & Girls Club

PROJECT AT A GLANCE:

Annual kWh reduction:	40,124 kWh
Total fixtures replaced:	118
Estimated annual savings:	$3,200
Total project incentive:	$8,430
Payback period:	11 months

THE OPPORTUNITY

The Entergy Arkansas Small Business Program helps customers like the Boys & Girls Club of Jacksonville, Ark. analyze their energy use, identify energy efficiency improvement projects and install cost-effective energy-saving measures. In an effort to achieve significant, long-term electricity savings, decision makers enlisted the help of the program team to explore potential savings opportunities.

ENTERGY SOLUTIONS
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THE PROJECT

After an on-site energy assessment, program representatives determined that to achieve maximum savings – while staying within the Boys & Girls Club's limited budget – the most viable solution would be a facility-wide lighting retrofit. With their sights set on savings, the staff worked with a local lighting contractor to replace all interior and exterior light fixtures and install occupancy sensors where needed. In the gym, metal halides were replaced with highly-efficient 6-lamp high bay fixtures; outside, 90 watt halogen bulbs were replaced with energy-saving 26 watt CFLs.

THE RESULTS

As shown above, the lighting upgrade resulted in significantly increased energy efficiency and an ROI that worked with the organization's budget. Most notably, the savings achieved are equivalent to the greenhouse gas emissions avoided by recycling 10.6 tons of waste instead of sending it to the landfill, according to the Environmental Protection Agency.

To learn more about the Small Business Program, visit **entergyarkansas.com/smallbusiness.**

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2.4 CitySmart®

CitySmart® Fact Sheet

FACT SHEET: 2013 CitySmart® Program

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

The CitySmart Program is offered to institutional and public entities, including governments, public/private schools and colleges in the Entergy Arkansas service area. The program helps facility supervisors operate their buildings more efficiently by understanding the technical and financial benefits of investing in energy efficiency and developing a plan to make energy efficiency improvements. Program participants receive technical and energy related assistance to help them make decisions about cost-effective investments in facility energy efficiency. The program does not prescribe technologies or end-uses, but instead provides a framework, through which the participant can receive incentives for implementing and installing a wide range of measures at their sites.

The CitySmart Program will help you:

- Identify energy savings specific to your buildings.
- Prioritize a wide range of energy-conservation measures.
- Achieve significant, long-term electricity savings.
- Earn incentives for completing qualifying energy efficiency projects.

Who is Eligible?

Institutional and public entities that receive electric service from Entergy Arkansas including:

- K-12 Schools.
- Accredited Higher Education.
- Local Governments.

What are the Benefits?

- Financial incentives.
- Reduced energy costs.
- Energy performance benchmarking and master planning.
- Technical assistance.
- Communications support.
- No-cost directly installed measures (low flow faucet aerators, pre-rinse spray valves, CFL's and vending misers).

How to Participate:

Please follow the steps below to participate:

1. Contact the Energy Efficiency Solutions Center at 877-212-2420.
2. Your program representative and participating contractor will help identify efficiency upgrade projects specific to your needs during a walk-through energy assessment.
3. Submit project application form.
4. Install energy-saving upgrades identified and agreed upon during the walk-through assessment.
5. Your program representative will complete post-installation inspection as required.
6. Apply for incentives.
7. Receive incentive check and recognition for completed energy efficiency accomplishments.

Program Incentives

New construction and retrofit projects are eligible for tiered incentives, based on the number of measures installed at one location.

CitySmart® Incentive Rates (per kWh)				
Measure Type*	1 measure	2 measures	3 measures	4+ measures
All Measures	$0.10	$0.11	$0.12	$0.14

**Note that no project will be provided incentives that exceed 75% of the sum of the incremental measure costs.*

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/citysmart.**

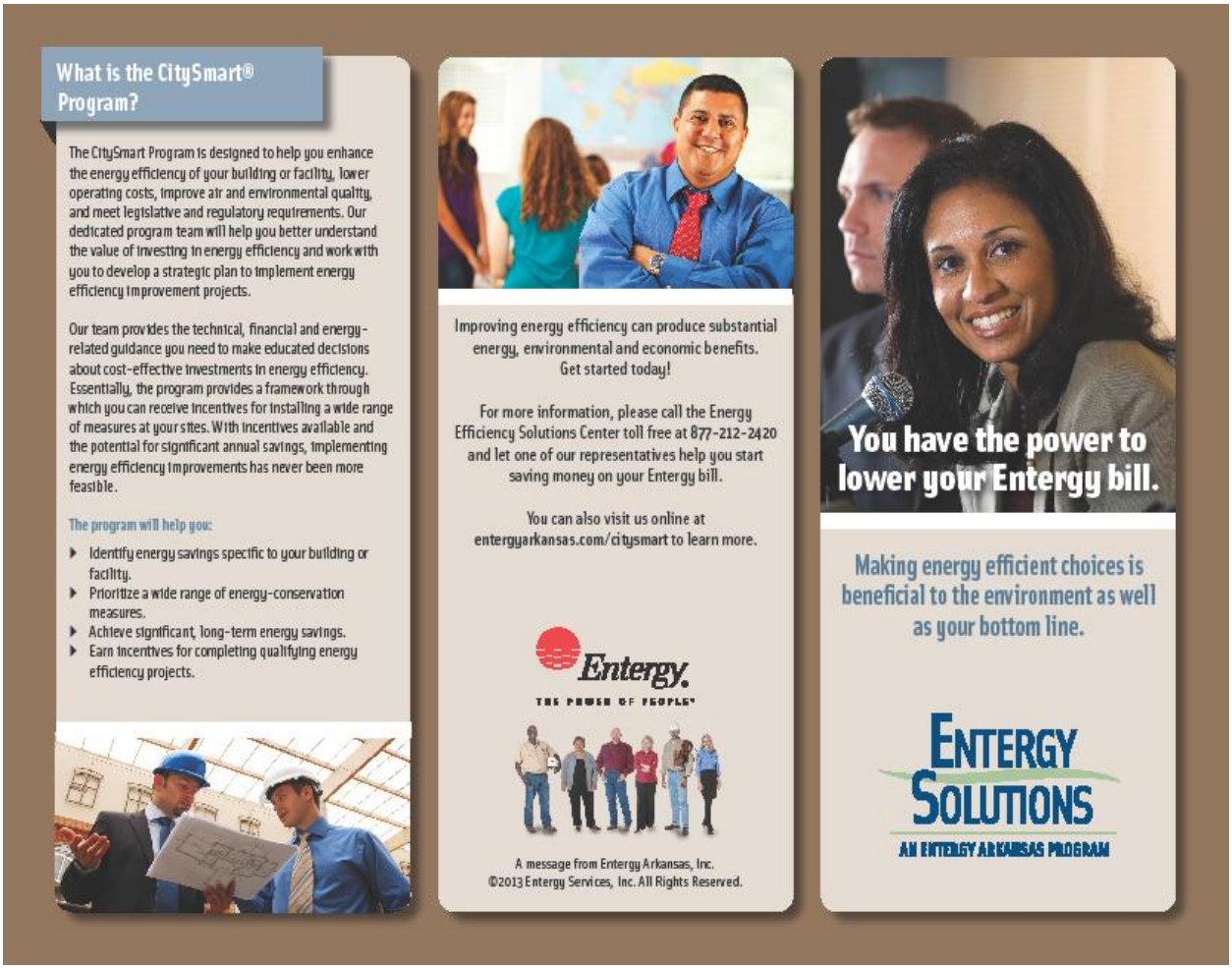
CitySmart® Fact Sheet, Reverse

2013 CitySmart® Program Eligible Measures

Measure Type	Measure Description
Lighting Retrofit	Lighting retrofit projects replace inefficient lighting systems with more efficient lighting systems. A variety of high efficiency fixtures, ballasts, and lamps produce equivalent light levels as previous technologies while consuming less energy. For instance, T12 fluorescent lamps and magnetic ballasts can be replaced with more efficient lighting systems such as T8 fluorescent lamps with electronic ballasts. Metal halides may be replaced with systems such as T5 fluorescent lamps with electronic ballasts or compact fluorescents. There are a variety of lamp and ballast combinations that are eligible for this program depending on the current technology installed at a facility.
Lighting Controls	Automatic lighting controls save energy by turning off or dimming lights when they are not necessary. Many different varieties of sensors are available including passive infrared, dual-technology, integral occupancy sensors, photocells, which can be coupled with a variety of control strategies including day lighting controls, occupancy controls timer controls and time clocks. For certain conditions, light reduction and automatic controls are mandatory for new construction and affected retrofit projects.
Exterior Lighting	Energy saving opportunities exist for all major exterior lighting applications including parking lots, streets and roadways, and other building mounted lighting. Energy saving opportunities applies to both improved lighting performance and enhanced control strategies. For example, retrofitting less efficient high intensity discharge technologies with light emitting diode lighting and occupancy-based technology are good candidates for exterior applications.
Window Film	Specialized window film can help block solar heat gain in a facility and reduce cooling loads. For this program, window film is only eligible for incentives when applied to the inside of glazing on the east and west windows of commercial buildings. Windows must not be shaded with existing awnings or shading devices, and window film must be installed in space conditioned by refrigerated air conditioning to qualify in the program.
HVAC Replacement	For existing buildings and new construction, non-ENERGY STAR qualified heat pumps and air conditioning units are eligible to be replaced with ENERGY STAR qualified units. Eligible units for replacement include small split system and single package air conditioners and heat pumps.
Chiller Replacement	Chillers are commonly used to provide cooling for a variety of building types and process loads. The most common applications are for larger cooling loads (e.g. 50 to 100 tons and greater). This measure applies to the replacement of air-cooled and water-cooled chillers with more energy efficient chillers.
HVAC Controls	HVAC controls are eligible in the Entergy Arkansas programs when no other controls previously exist or where existing controls can be modified or improved to provide measurable energy savings. Controls can be installed on building HVAC systems or central plant equipment to help control common operating parameters such as temperature, humidity, chilled water temperature, etc. for more effective use of the HVAC system.
VFD Motor Drives	A variable frequency drive (VFD) controls the rotational speed of an electric motor by controlling the frequency of the electrical power supplied to the motor. VFDs allow for soft starts and can be optimized to better match system loads, reducing stress and improving the motor life. VFDs work well when used with systems that have motors that can operate at lower speeds. The installation of VFDs that show measurable energy savings are eligible under the program.
Improved Building Design (New Construction Only)	Incentives are given to buildings that are built above and beyond the required energy codes. These measures will be incentivized as a part of the individual measure type (lighting, lighting controls, HVAC, etc.) as listed below for the purposes of qualifying for tiered incentives, and are not separate measures from retrofits of similar technology. For instance, if a participant is installing a lighting retrofit at one facility and is building a new facility with a qualifying lighting project, all of the lighting measures are considered one lighting measure for the purposes of calculating tiered incentives.
Refrigeration	There are a number of refrigeration measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Evaporator fans upgrades to electronically commutated motors. • Anti-sweat heater controls. • Refrigerated door gaskets.
Kitchen and Plumbing Upgrades	There are a number of kitchen measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Low flow pre-rinse spray valves. • Low flow faucet aerators. • Low flow shower heads. • Energy efficient dishwasher. • High efficiency electric combination ovens. • High efficiency fryers. • ENERGY STAR® steam cookers.
Waste Water Treatment Plant (WWTP) Fans/ Blower Retrofits	These measures are ideal for aeration blowers that are greater than 100 HP and have no VFD controls. The replacement must be a single-stage centrifugal aeration blower with automatic dissolved oxygen controls to be a cost-effective project.
Waste Water Treatment Plant (WWTP) Pump Retrofits	There are a variety of energy efficiency upgrades that can be implemented on pumps at WWTPs. Retrofits can be completed on pumps that are centrifugal pumps, do not have VFD or stop controls, total nameplate HP is greater than 100 HP, and operating hours greater than 3,000 hours/year. Retrofit options include the installation of VFDs, start/stop controls, throttle valves and bypass controls.
Personal Computer Power Management (PCPM)	Personal Computer Power Management is a computer software that turns off the power of a device when it's not in use, or puts the hardware into the lowest power demand state available. This method of energy conservation is highly attractive to both cities and schools where a significant amount of computers are used regularly.

Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/citysmart.

CitySmart® Trifold



What is the CitySmart® Program?

The CitySmart Program is designed to help you enhance the energy efficiency of your building or facility, lower operating costs, improve air and environmental quality, and meet legislative and regulatory requirements. Our dedicated program team will help you better understand the value of investing in energy efficiency and work with you to develop a strategic plan to implement energy efficiency improvement projects.

Our team provides the technical, financial and energy-related guidance you need to make educated decisions about cost-effective investments in energy efficiency. Essentially, the program provides a framework through which you can receive incentives for installing a wide range of measures at your sites. With incentives available and the potential for significant annual savings, implementing energy efficiency improvements has never been more feasible.

The program will help you:

- Identify energy savings specific to your building or facility.
- Prioritize a wide range of energy-conservation measures.
- Achieve significant, long-term energy savings.
- Earn incentives for completing qualifying energy efficiency projects.

Improving energy efficiency can produce substantial energy, environmental and economic benefits. Get started today!

For more information, please call the Energy Efficiency Solutions Center toll free at 877-212-2420 and let one of our representatives help you start saving money on your Entergy bill.

You can also visit us online at entergyarkansas.com/citysmart to learn more.

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You have the power to lower your Entergy bill.

Making energy efficient choices is beneficial to the environment as well as your bottom line.

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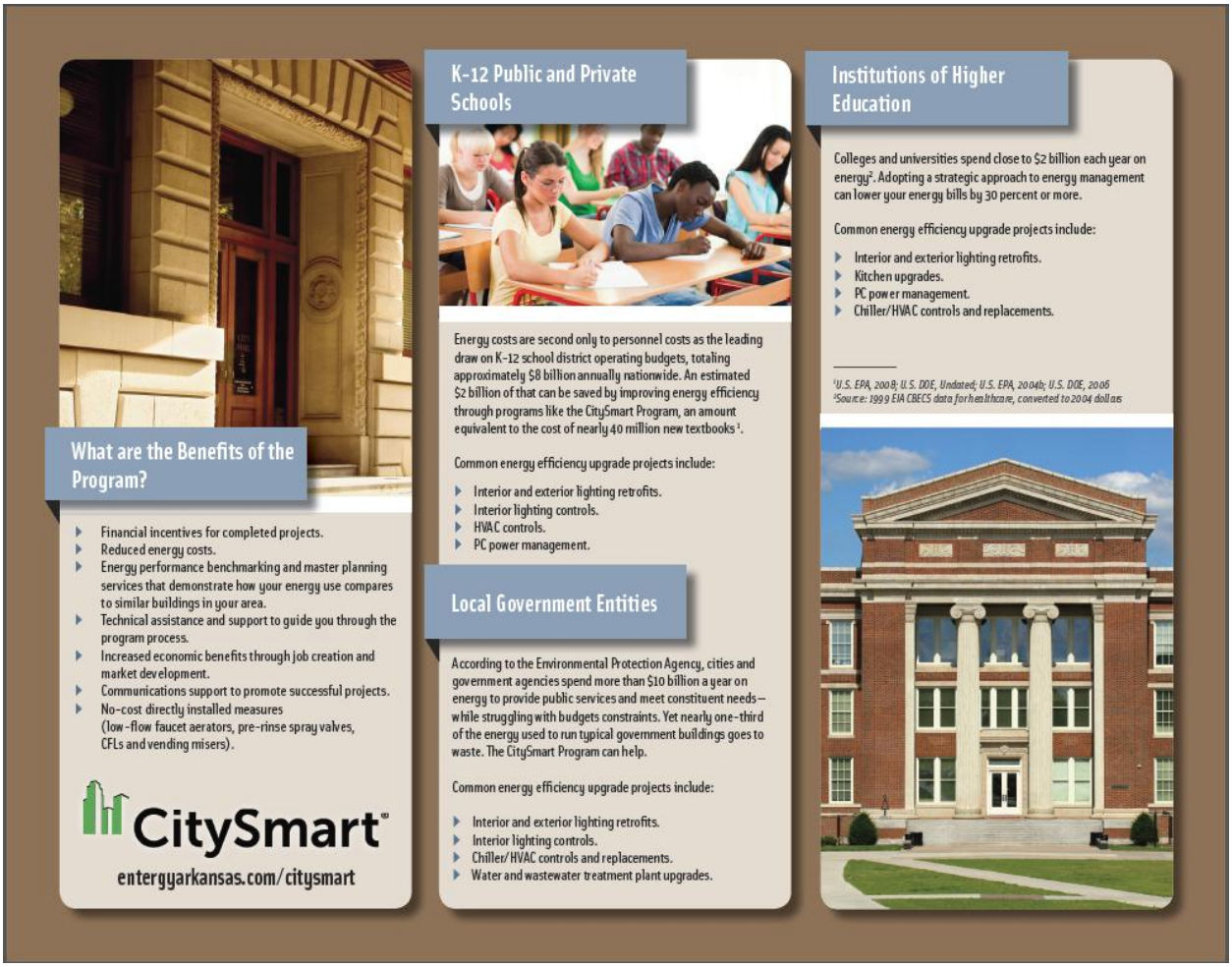
CitySmart® Trifold, Reverse



What are the Benefits of the Program?

- Financial incentives for completed projects.
- Reduced energy costs.
- Energy performance benchmarking and master planning services that demonstrate how your energy use compares to similar buildings in your area.
- Technical assistance and support to guide you through the program process.
- Increased economic benefits through job creation and market development.
- Communications support to promote successful projects.
- No-cost directly installed measures (low-flow faucet aerators, pre-rinse spray valves, CFLs and vending misers).

CitySmart®

entergyarkansas.com/citysmart

K-12 Public and Private Schools

Energy costs are second only to personnel costs as the leading draw on K-12 school district operating budgets, totaling approximately $8 billion annually nationwide. An estimated $2 billion of that can be saved by improving energy efficiency through programs like the CitySmart Program, an amount equivalent to the cost of nearly 40 million new textbooks [1].

Common energy efficiency upgrade projects include:

- Interior and exterior lighting retrofits.
- Interior lighting controls.
- HVAC controls.
- PC power management.

Local Government Entities

According to the Environmental Protection Agency, cities and government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs—while struggling with budgets constraints. Yet nearly one-third of the energy used to run typical government buildings goes to waste. The CitySmart Program can help.

Common energy efficiency upgrade projects include:

- Interior and exterior lighting retrofits.
- Interior lighting controls.
- Chiller/HVAC controls and replacements.
- Water and wastewater treatment plant upgrades.

Institutions of Higher Education

Colleges and universities spend close to $2 billion each year on energy[2]. Adopting a strategic approach to energy management can lower your energy bills by 30 percent or more.

Common energy efficiency upgrade projects include:

- Interior and exterior lighting retrofits.
- Kitchen upgrades.
- PC power management.
- Chiller/HVAC controls and replacements.

[1] U.S. EPA, 2008; U.S. DOE, Undated; U.S. EPA, 2004b; U.S. DOE, 2006
[2] Source: 1999 EIA CBECS data for healthcare, converted to 2004 dollars

CitySmart® PC Power Management

Measure Brief: How a Personal Computer Power Management System Can Significantly Reduce Your Entergy Bill.

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Personal Computer Power Management

Computer power management software automatically places computers into a low-power "sleep mode" after a period of inactivity. While most PCs have built-in power-saving features, there are many instances in which processes running on the computer interefere with the low-power settings – resulting in an excessive amount of wasted energy. PC power management software offers features beyond those present in the operating system, allowing your hardware to activate the lowest power demand state available when idle.

How Will I Benefit?

- Entergy Arkansas offers valuable incentives for the implementation of this no-cost measure.
- PC power management can save up to $50 per computer annually.
- Managing your PC's power consumptions can reduce IT-related energy costs by up to 60 percent.

Source: ENERGYSTAR.gov

Let's Talk Process

- Once you've enrolled in one of Entergy's commercial and industrial programs, a survey will be conducted to determine how many computers are active in your facility.
- After determining the number of active computers, the program representative will work with your internal IT personnel to confirm that a PC power management solution is viable for your facility. If viable, your program representative will continue working with your IT team to determine which PC power management solution best fits your specific needs.
- Next, in order for you to select a vendor, we will provide you with a list of program-trained vendors who specialize in PC power management.
- Finally, your chosen vendor will install the appropriate software on your computers – at NO COST TO YOU.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/commercial.

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INTERESTING FACTS

- Although most new PCs are ENERGY STAR® qualified and have power management features, ENERGY STAR estimates that only 5 percent of PCs actually have those features activated.
- Products using power management features generate up to 25 percent less heat and tend to be quieter than conventional products, saving you an additional $5 - $10 per PC annually.
- The average PC wastes half of the energy it consumes. Lawrence Berkeley Laboratory reports that the typical PC is in use only four hours each workday and sits idle for more than five hours.

Source: pcpowermanagement.com

CitySmart® Case Study: Harding University

CASE STUDY

Harding University

PROJECT AT A GLANCE:

Annual kWh reduction:	827,867 kWh
Annual kW reduction:	220.85 kW
Estimated annual savings:	$66,229
Total project incentive:	$99,345
Total fixtures replaced:	4,232
Payback period:	~1.5 years

THE OPPORTUNITY

In an effort to enhance energy efficiency, lower operating costs and improve indoor lighting quality, Harding University joined Entergy Arkansas' CitySmart® Program. With the help of the program team and a local lighting contractor, university officials decided campus-wide upgrades to the existing lighting system were necessary to achieve the anticipated energy savings.

ENTERGY SOLUTIONS
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THE PROJECT

Spanning 15 buildings, the massive lighting retrofit consisted of more than 4,200 fixture replacements. Existing interior fixtures were primarily substituted with high-efficiency Sylvania Octron T8 2-lamp 800 series lighting systems with reduced ballast factors. (In some cases, 3- and 4-lamp fixtures were still necessary.) In addition, outdated incandescent bulbs were replaced with CFLs where applicable, and both the exterior security lighting system and exit signs were replaced with LEDs.

THE RESULTS

While yielding a short ROI, the lighting retrofit saved more than 827,860 kilowatt hours of electricity a year, equivalent to eliminating the annual greenhouse gas emissions from 122 passenger vehicles, according to the Environmental Protection Agency.

To learn more about the CitySmart Program, visit **entergyarkansas.com/citysmart**.

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CitySmart® Case Study: Pulaski School District

CASE STUDY

Pulaski County Special School District

PROJECT AT A GLANCE:

Annual kWh reduction:	2,357,094 kWh
Estimated annual savings:	$188,567
Total project incentive:	$190,714
Cost to PCSSD	$0

THE OPPORTUNITY

To reduce costs and improve learning environments for students throughout the Pulaski County Special School District, administrators partnered with the staff of Entergy Arkansas' CitySmart® Program to identify cost-effective ways to improve energy efficiency throughout the district.

THE PROJECT

According to ENERGY STAR®, 60 percent of the computers and monitors at organizations such as K-12 schools are left on at night, and 40 percent of monitors are not enabled for power management. This results in energy waste that costs schools and other organizations about $750 million every year. To reduce energy costs associated with ineffective computer power management, PCSSD worked with Entergy Arkansas to install PC power management software at 25 schools throughout the district.

THE RESULTS

PCSSD now houses 1,444 laptops and 4,522 desktops that are equipped with power management software, which will save the district an estimated $188,567 in energy costs each year. To help PCSSD finance the project, the CitySmart program provided over $190,000 in cash incentives, which covered the entire cost of the upgrade.

MOVING FORWARD

Prior to this project, PCSSD worked with CitySmart program staff to improve interior lighting quality and efficiency by replacing metal halide lighting fixtures with T-5 fixtures in 11 schools throughout the district. Exterior lighting is next for PCSSD: administrators plan to install energy-saving light-emitting diode (LED) fixtures throughout the district.

To learn more about the CitySmart Program, visit **entergyarkansas.com/citysmart**.

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2.5 C&I Custom & Prescriptive

C&I Custom Program Fact Sheet

FACT SHEET: 2013 Commercial & Industrial Custom Program

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The Commercial & Industrial Custom Program is offered to commercial and industrial customers of Entergy Arkansas. The program helps facility supervisors like you operate your buildings more efficiently by understanding the technical and financial benefits of investing in energy efficiency upgrades and developing a plan to make energy efficiency improvements. Program participants will receive technical and energy-related assistance to help you make decisions about cost-effective investments in your facility's energy efficiency.

The C&I Custom Program will help you:

- Improve the efficiency and performance of your facility.
- Achieve significant, long-term energy savings.
- Earn incentives to help offset the cost of energy efficiency upgrades.

Who is Eligible?

Commercial and industrial customers with:

- A valid Entergy Arkansas account number.
- A connected load of 100 kW or greater.

What are the Benefits?

- Financial incentives.
- Reduced energy costs.
- Access to participating trade ally network.
- Walk-through energy assessments.

How to Participate:

Please follow the steps below to participate:

1. Contact a participating contractor. A complete list can be found at entergyarkansas.com/largecustom or by calling the Energy Efficiency Solutions Center at 877-212-2420.
2. Your program representative and participating contractor will help identify efficiency upgrade projects specific to your needs during a walk-through energy assessment.
3. Submit project application form.
4. Participating contractor will install energy-saving upgrades identified and agreed upon during the walk-through assessment.
5. Program representative will complete post-installation inspection as required.
6. Work with program representative to finalize program documentation and apply for incentives.
7. Receive incentive check.

Program Incentives

New construction and retrofit projects are eligible for tiered incentives, based on the number of measures installed.

C&I Custom Incentive Rates (per kWh)

Measure Type*	1	2	3	4	5	6+
Prescriptive Measures	N/A	$0.15	$0.15	$0.16	$0.17	$0.18
All Other Projects	$0.15	$0.16	$0.17	$0.19	$0.21	$0.23

**Note that no project will be provided incentives that exceed 75% of the sum of the incremental measure costs.*

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/largecustom**.

C&I Custom Program Fact Sheet, Reverse

2013 C&I Custom Program Eligible Measures

Measure Type	Measure Description
Improved Building Design (New Construction Only)	Incentives are given to buildings that are built above and beyond the required energy codes. These measures will be incentivized as a part of the individual measure type (lighting, lighting controls, HVAC, etc.) as listed below for the purposes of qualifying for tiered incentives and are not separate measures from retrofits of similar technology. For instance, if a participant is installing a lighting retrofit at one facility and is building a new facility with a qualifying lighting project, all of the lighting measures are considered one lighting measure for the purposes of calculating tiered incentives.
Lighting Retrofit	Lighting retrofit projects replace inefficient lighting systems with more efficient lighting systems. A variety of high efficiency fixtures, ballasts, and lamps produce equivalent light levels as previous technologies while consuming less energy. For instance, T12 Fluorescent lamps and magnetic ballasts can be replaced with more efficient lighting systems such as T8 Fluorescent lamps with electronic ballasts. Metal halides may be replaced with systems such as T5 fluorescent lamps with electronic ballasts or compact fluorescents. There are a variety of lamp and ballast combinations that are eligible for this program depending on the current technology installed at a facility.
Lighting Controls	Automatic lighting controls save energy by turning off or dimming lights when they are not necessary. Many different varieties of sensors are available including passive infrared, dual-technology, integral occupancy sensors, photocells, which can be coupled with a variety of control strategies including day lighting controls, occupancy controls timer controls and time clocks. For certain conditions, light reduction and automatic controls are mandatory for new construction and affected retrofit projects.
Exterior Lighting	Energy saving opportunities exist for all major exterior lighting applications including parking lots, streets and roadways and other building mounted lighting. Energy saving opportunities apply to both improved lighting performance and enhanced control strategies. For example, retrofitting less efficient high intensity discharge technologies with light emitting diode lighting and occupancy-based technology are good candidates for exterior applications.
Window Film	Specialized window film can help block solar heat gain in a facility and reduce cooling loads. For this program, window film is only eligible for incentives when applied to the inside of glazing on the east and west windows of commercial buildings. Windows must not be shaded with existing awnings or shading devices, and window film must be installed in space conditioned by refrigerated air conditioning to qualify in the program.
HVAC Replacement	For existing buildings and new construction, non-ENERGY STAR qualified heat pumps and air conditioning units are eligible to be replaced with ENERGY STAR qualified units. Eligible units for replacement include small split system and single package air conditioners and heat pumps.
Chiller Replacement	Chillers are commonly used to provide cooling for a variety of building types and process loads. The most common applications are for larger cooling loads (e.g. 50 to 100 tons and greater). This measure applies to the replacement of air-cooled and water-cooled chillers with more energy efficient chillers.
HVAC Controls	HVAC controls are eligible in the Entergy Arkansas Programs when no other controls previously exist or where existing controls can be modified or improved to provide measurable energy savings. Controls can be installed on building HVAC systems or central plant equipment to help control common operating parameters such as temperature, humidity, chilled water temperature, etc. for more effective use of the HVAC system.
VFD Motor Drives	A variable frequency drive, or VFD, controls the rotational speed of an electric motor by controlling the frequency of the electrical power supplied to the motor. VFDs allow for soft starts and can be optimized to better match system loads, reducing stress and improving the motor life. VFDs work well when used with systems that have motors that can operate at lower speeds. The installation of VFDs that show measurable energy savings are eligible under the program.
Data Center Upgrades	Data center upgrades that qualify for Entergy Arkansas Programs include VFD retrofits, cooling upgrades, hot/cold aisle containment, installation of PC Power Management software, and server virtualization. Any combination of these measures will greatly increase the energy efficiency of data centers or server rooms.
Refrigeration	There are a number of refrigeration measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Evaporator fans upgrades to electronically commutated motors. • Anti-sweat heater controls.
Kitchen and Plumbing Upgrades	There are a number of kitchen measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Low flow pre-rinse spray valves. • Low flow faucet aerators. • Low flow shower heads. • Energy-efficient dishwasher. • High efficiency electric combination ovens. • High efficiency fryers. • ENERGY STAR steam cookers.
Compressed Air	Compressed air retrofits are ideal when there are significant air leaks; compressors run at less than full capacity, compressors are run in modulation mode, discharge pressure is greater than 110 psig, or when compressed air is used for tasks that do not require high pressure. Installation of new air compressor equipment and controls is eligible under this program provided that the savings can be measured and verified.
Industrial Process Improvements	Process improvements in commercial and industrial facilities can provide electrical energy savings as well as increased production. Installation of new, cost-effective process equipment and modifications to sequences and controls in existing processes are both eligible measures for review and acceptance under the program.

Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/largecustom.

C&I Prescriptive Program Fact Sheet

FACT SHEET: 2013 Commercial & Industrial Prescriptive Program

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The Commercial & Industrial Prescriptive Program is offered to non-residential customers in the Entergy Arkansas service area. The program helps customers like you operate buildings more efficiently by helping you understand the technical and financial benefits of investing in energy efficiency and developing a plan to make energy efficiency improvements. Participants receive direct cash incentives for completing qualifying energy efficiency projects.

The C&I Prescriptive Program will help you:

- Operate your facility more efficiently.
- Achieve significant, long-term energy savings.
- Earn incentives to help offset the cost of energy efficiency upgrades.

Who is Eligible?

Commercial and industrial customers with a valid Entergy Arkansas account number.

What are the Benefits?

- Financial incentives.
- Reduced energy costs.
- Energy savings calculations assistance.

How to Participate:

Please follow the steps below to participate:

1. Contact a participating contractor. A complete list can be found at entergyarkansas.com/largeprescriptive or by calling the Energy Efficiency Solutions Center at 877-212-2420.
2. Your program representative and participating contractor will help identify efficiency upgrade projects specific to your needs during a walk-through energy assessment.
3. Submit project application form.
4. Participating contractor will install energy-saving upgrades identified and agreed upon during the walk-through assessment.
5. Program representative will complete post-installation inspection as required.
6. Work with program representative to finalize program documentation and apply for incentives.
7. Receive incentive check.

Program Incentives

The incentive rates for this program have been set to maximize the inclusion of cost-effective measures where commercial "deemed savings" exist. The incentives for eligible measures are listed below. These rates are set at levels intended to remain through 2013 and may be adjusted at any time during the program year.

C&I Prescriptive Incentive Rate (per kWh)	
All Prescriptive Projects (including retrofits, new equipment installations, and improved building design)	$0.15

**Note that no project will be provided incentives that exceed 75% of the sum of the incremental measure costs.*

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/largeprescriptive**.

C&I Prescriptive Program Fact Sheet, Reverse

2013 C&I Prescriptive Program Eligible Measures

Measure Type	Measure Description
Improved Building Design (New Construction Only)	Incentives are given to buildings that are built above and beyond the required energy codes. These measures will be incentivized as a part of the individual measure type (lighting, lighting controls, HVAC, etc.) as listed below for the purposes of qualifying for tiered incentives, and are not separate measures from retrofits of similar technology. For instance, if a Participant is installing a lighting retrofit at one facility and is building a new facility with a qualifying lighting project, all of the lighting measures are considered one lighting measure for the purposes of calculating tiered incentives.
Lighting Retrofit	Lighting retrofit projects replace inefficient lighting systems with more efficient lighting systems. A variety of high efficiency fixtures, ballasts, and lamps produce equivalent light levels as previous technologies while consuming less energy. For instance, T12 fluorescent lamps and magnetic ballasts can be replaced with more efficient lighting systems such as T8 fluorescent lamps with electronic ballasts. Metal halides may be replaced with systems such as T5 fluorescent lamps with electronic ballasts or compact fluorescents. There are a variety of lamp and ballast combinations that are eligible for this program depending on the current technology installed at a facility.
Exterior Lighting	Energy saving opportunities exist for all major exterior lighting applications including parking lots, streets and roadways, and other building mounted lighting. Energy saving opportunities applies to both improved lighting performance and enhanced control strategies. For example, retrofitting less efficient high intensity discharge technologies with light emitting diode lighting and occupancy-based technology are good candidates for exterior applications.
Lighting Controls	Automatic lighting controls save energy by turning off or dimming lights when they are not necessary. Many different varieties of sensors are available including passive infrared, dual-technology, integral occupancy sensors, photocells, which can be coupled with a variety of control strategies including day lighting controls, occupancy controls timer controls and time clocks. For certain conditions, light reduction and automatic controls are mandatory for new construction and affected retrofit projects.
HVAC Replacement	For existing buildings and new construction, non-ENERGY STAR qualified heat pumps and air conditioning units are eligible to be replaced with ENERGY STAR qualified units. Eligible units for replacement include small split system and single package air conditioners and heat pumps.
Chiller Replacement	Chillers are commonly used to provide cooling for a variety of building types and process loads. The most common applications are for larger cooling loads (e.g. 50 to 100 tons and greater). This measure applies to the replacement of air-cooled and water-cooled chillers with more energy efficient chillers.
Refrigeration	There are a number of refrigeration measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Evaporator fans upgrades to electronically commutated motors. • Anti-sweat heater controls.
Kitchen and Plumbing Upgrades	There are a number of kitchen measures that are eligible for upgrades or replacement in Entergy Arkansas Programs: • Low flow pre-rinse spray valves. • Low flow faucet aerators. • Low flow shower heads. • Energy efficient dishwasher. • High efficiency electric combination ovens. • High efficiency fryers. • ENERGY STAR steam cookers.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/largeprescriptive.

C&I Program Trifold

Why is Investing in Energy Efficiency Important?

Commercial and industrial buildings are diverse in how they look and function – they include everything from the corner dry cleaner to hospitals, manufacturers, huge data centers and skyscrapers.

- Commercial buildings account for 36 percent of all U.S. electricity consumption and cost more than $190 billion in energy every year.
- Commercial buildings are also responsible for 18 percent of U.S. carbon dioxide emissions, a primary greenhouse gas, and consume more than 18 percent of U.S. primary energy – more than all of Canada's energy consumption.
- The potential to reduce energy consumption in existing and new commercial buildings is enormous. On average, 30 percent of the energy used in commercial buildings is wasted, according to the U.S. Environmental Protection Agency.

Source: U.S. Department of Energy

Improving energy efficiency can produce substantial energy, environmental and economic benefits. Get started today!

For more information, please call the Energy Efficiency Solutions Center toll free at 877-212-2420 and let one of our representatives help you start saving money on your Entergy bill.

You can also visit us online at entergyarkansas.com/commercial.

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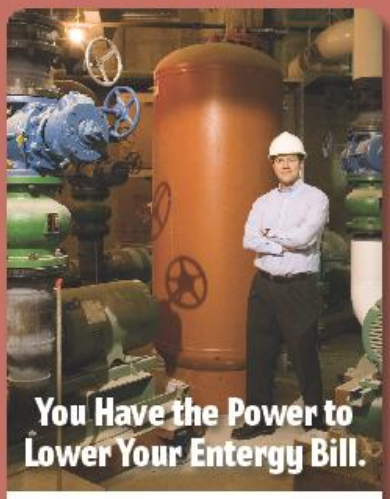

You Have the Power to Lower Your Entergy Bill.

Entergy's Commercial & Industrial Programs allow you to make energy-efficient choices that are beneficial to the environment as well as your bottom line.

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C&I Program Trifold, Reverse

What are the Benefits of the Programs?

Energy savings achieved through the implementation of energy-efficient upgrades to new or existing buildings is one of the most attractive and low-cost options to reduce electric demand, improve comfort and increase efficiency. Entergy's Commercial & Industrial Programs make this challenge easier than ever.

Benefits of participating include:

- Financial incentives for completed projects.
- Significantly reduced energy costs and carbon footprint.
- Technical assistance and support to guide you through the program process.
- Increased economic benefits through job creation and market development.
- Communications support to promote successful projects.
- Reduced need for future power plants.
- No-cost energy-efficient products (low-flow faucet aerators, pre-rinse spray valves, vending misers and possibly CFLs).

The Commercial & Industrial Programs are offered to all commercial and industrial customers in the Entergy Arkansas service area. These programs are designed to help you operate your buildings more efficiently, maintain system efficiency and decrease your monthly Entergy bill.

Worried about costly projects? Don't be. Entergy Arkansas provides financial incentives to help offset the initial cost of energy efficiency upgrades.

Custom Program

The more comprehensive Commercial & Industrial Custom Program helps customers like you operate buildings more efficiently. Our program representatives help you understand the technical and financial benefits of investing in energy efficiency upgrades and develop a plan to effectively implement energy efficiency improvements.

Eligible measures include, but are not limited to:

- Air compressor upgrades.
- Variable speed drives.
- Building automation.
- Injection molding improvements.
- Data center upgrades.
- Industrial process improvements.
- PC power management.

Prescriptive Program

Similar to the Custom Program, the Commercial & Industrial Prescriptive Program provides consultative energy services and incentives for projects that improve the energy efficiency of your facilities.

Eligible measures include, but are not limited to:

- Interior and exterior lighting retrofits/controls.
- HVAC and chiller replacement.
- Improved building design (new construction).
- High-efficiency motors.
- Commercial refrigeration.
- Commercial kitchen and plumbing upgrades.

Visit us today to find out more about these and other energy-saving programs at entergyarkansas.com/commercial.

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CNP Seminar Invite

MAY 2013
TRADE ALLY SUMMIT
Learn How to Increase Business

WHERE:
1 Allied Dr, Bldg 3
Tom Glaze Auditorium
Little Rock, AR 72202

WHEN:
Tuesday, May 21, 2013
9:00 a.m. - Noon
Lunch will be provided.

Seating is limited so reserve your spot today! RSVP to April Wolcott at (501) 221-4041 or april.wolcott@CLEAResult.com.

This free workshop will help you better understand:

- Entergy and CenterPoint energy efficiency program incentives.
- How to utilize program incentives to help you close more jobs.
- How to take advantage of utility-approved support and marketing collateral.
- How to become a participating contractor in energy efficiency programs available in your area.

Summit sponsored by:

CenterPoint Energy | Entergy. THE POWER OF PEOPLE

C&I Prescriptive Mailer

C&I Prescriptive Mailer, Reverse

Business Solutions Programs Participation Agreement

2013 BUSINESS SOLUTIONS PROGRAMS PARTICIPATION AGREEMENT

TAKE CONTROL OF YOUR ENERGY USE
Entergy Arkansas-sponsored energy efficieny programs for large commercial and industrial customers can help.

Entergy Arkansas is proud to offer a suite of program offerings to encourage energy efficiency improvements for its large commercial and industrial customers. Each program offers financial incentives along with technical and consulting assistance to help customers identify, develop and implement energy efficiency projects. From the installation of new light fixtures to larger, more complex equipment and processes, the programs provide the necessary resources to make immediate and sustainable reductions in energy use and spending.

Commercial & Industrial Prescriptive Program
The Commercial & Industrial Prescriptive Program offers an easy way for non-residential customers to see significant savings without having to worry about complex analysis or detailed participation rules. The program incentivizes both new construction and retrofit projects. Participants can choose from qualified technologies, such as lighting, lighting controls, HVAC equipment, etc.

Commercial & Industrial Custom Program
Many large commercial and industrial customers engage in energy efficiency projects that require a high level of technical assistance. The Commercial & Industrial Custom Program is designed for these customers and will feature bonus incentives for projects that include multiple measure types and/or end uses. Participants can choose from qualified technologies, such as variable speed drives, building controls, industrial process improvement, air compressors, data center improvements, etc.

CitySmart® Program
The CitySmart program targets public sector facilities, including those run by counties, cities and towns, as well as primary schools, secondary schools, accredited junior colleges and universities. The program incentivizes energy saving measures in both new construction and retrofit projects, such as lighting, lighting controls, variable speed drives, building controls, data center improvements, wastewater treatment plant improvements, etc.

STEPS TO PARTICIPATE:

1. Sign and submit the participation agreement on back to enroll.
2. Program administrator will contact you to determine the specific program for which your organization is eligible.
3. Work with the program administrator to discuss energy efficiency project opportunities.
4. Schedule your pre-installation inspection with the program in order to allow the program administrator to quantify prospective energy savings.
5. For custom and CitySmart projects, you will receive a summary report of findings at your facility, including opportunities and potential savings.
6. For all programs, sign and submit a project application to define projects to be completed and reserve incentive funds.
7. Complete projects defined in the project application and post-installation inspection.
8. Notify program administrator of project completion and schedule post-inspection as required.
9. Receive incentive dollars from Entergy Arkansas and benefit from future years of energy and Entergy bill savings.
10. After completing the project and receiving incentives, the participant may be contacted by an independent evaluator to verify information gathered by the program and/or to review on-site equipment installation.

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Business Solutions Programs Participation Agreement, Reverse

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2013 ENTERGY ARKANSAS ACCEPTANCE OF AGREEMENT

Entergy Arkansas has contracted with CLEAResult to sponsor, promote and administer the Commercial & Industrial Prescriptive, Commercial & Industrial Custom and CitySmart programs. _____, (herein referred to as "participant") recognizes that it is a willing participant of these programs, which are designed to help reduce Entergy bills, freeing up operating dollars for other needs.

This participation agreement reflects the voluntary collaboration between your organization and the Entergy Arkansas-sponsored Commercial & Industrial Prescriptive, Commercial & Industrial Custom and CitySmart programs. The terms below detail the general commitments of the participant in order to improve the energy efficiency of their facilities. Please note that specific terms and conditions of each program are more fully described in the program manual. Applicable program manuals will be shared with the participant once the program administrator has selected the appropriate program options for a specific participant.

The program administrator agrees to provide services to the participant with the understanding that the participant will exert its best efforts to implement cost-effective energy efficiency recommendations. Projects submitted to the program must be completed by Dec. 1, 2013 to receive incentive funds and allow time for post-installation inspections.

TO PARTICIPATE IN THESE PROGRAMS, YOU WILL NEED TO UNDERSTAND AND AGREE TO THESE TERMS:

1. Participant acknowledges that it will be provided with the appropriate program manual and will abide by the terms and processes set forth in this document.
2. Participant will identify a contact person to work with the program throughout the term of this agreement. He or she will work with the program to identify, assess and implement cost-effective energy efficiency measures.
3. The programs will reserve incentive funds for eligible energy-saving projects and will pay the participant monetary incentives based on projects completed within each program year.
4. Participant will make its best effort to complete and submit relevant project application forms, including necessary supporting documentation for each project, in a timely manner. The project application process is required in order to reserve financial incentives for projects.
5. Participant will allow the program to use participant's name to promote enrollment to entities, including the general public, potential program participants, utilities, as well as federal, state or local entities.
6. Participant acknowledges that, as part of its participation in this program, it will maintain eligibility to receive program services and incentives from the date of this participation agreement until Dec. 31, 2013.

By endorsing below, your organization accepts this agreement with Entergy Arkansas
This agreement should be signed by your organization's director, president or similar executive and is valid through the 2013 program year. If participant wishes to end its participation in the program, it may do so at anytime by providing the program administrator written notice of its intentions.

Organization: _____ Title: _____

First Name: _____ Last Name: _____

Address, City, State, Zip: _____

Telephone: _____ Email: _____

Account Number*: _____ Tax ID: _____

*If more than one account number, please provide a separate list of buildings, physical addresses and account numbers.

SIGNATURE: _____ **DATE:** _____

Please sign and e-mail to the appropriate contact below. If electronic submission is unavailable, please fax to 866-420-0189.

CSI Prescriptive & Custom and City Smart:
April Wolcott
April.Wolcott@CLEAResult.com

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com.

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Business Solutions Programs Truck Magnet

Business Solutions Program

Participating Contractor

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ENAR Convenience Store Flyer

Convenience Stores: Achieve Significant, Long-term Savings Through Energy Efficiency.

ENTERGY SOLUTIONS

Reduce Consumption. Increase Savings.

While the convenience store industry shares many of the energy-related issues we see in other sectors, such as lighting and heating and cooling, its strong dependence on refrigeration translates into excessively high energy bills. On average, refrigeration consumes 38 percent of a building's energy use, while lighting consumes 23 percent – combined that's more than half of a building's energy use. Entergy Arkansas' energy efficiency programs offer solutions that will not only improve the efficiency of your refrigeration equipment, but also the lighting and HVAC systems in your facility.

Cut Costs With Efficient Technology.

- With good design, lighting energy use in most buildings can be cut at least in half while maintaining or improving lighting quality.
- Compared to standard models, ENERGY STAR® labeled commercial refrigerators and freezers can lead to energy savings of as much as 35 percent with a 1.3 year payback.
- Heating and cooling systems have advanced significantly in design and efficiency. Even if your air conditioner is only 10 years old, you could save up to 20 percent or more on your cooling energy costs by replacing it with a newer, more efficient model.

Source: ENERGYSTAR.gov

Lower Your Monthly Entergy Bill.

- Once you've enrolled in one of Entergy's commercial and industrial programs, a program representative will perform an on-site inspection of your store's refrigeration, lighting, heating and cooling systems – at no cost to you.
- After determining which measures will achieve maximum savings, the program representative will compare the data gathered to industry standards. Such measures typically include interior and exterior lighting technologies, refrigeration systems and HVAC systems.
- Next, you will receive a customized list of recommendations. This list prioritizes projects that, if implemented, will increase efficiency and significantly reduce your Entergy bills.
- We will provide a list of qualified participating contractors enrolled in Entergy Arkansas' Entergy Solutions Programs that will install the upgrades.
- Finally, you'll receive cash incentives for any qualified completed projects.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/commercial.

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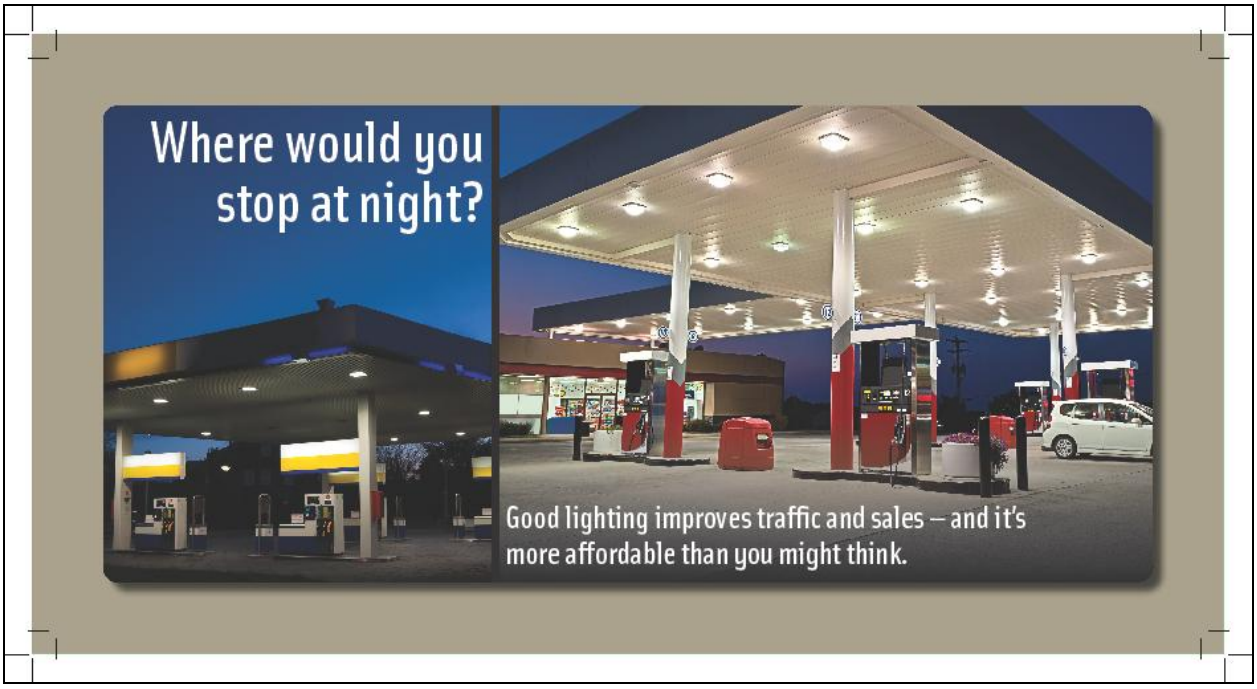
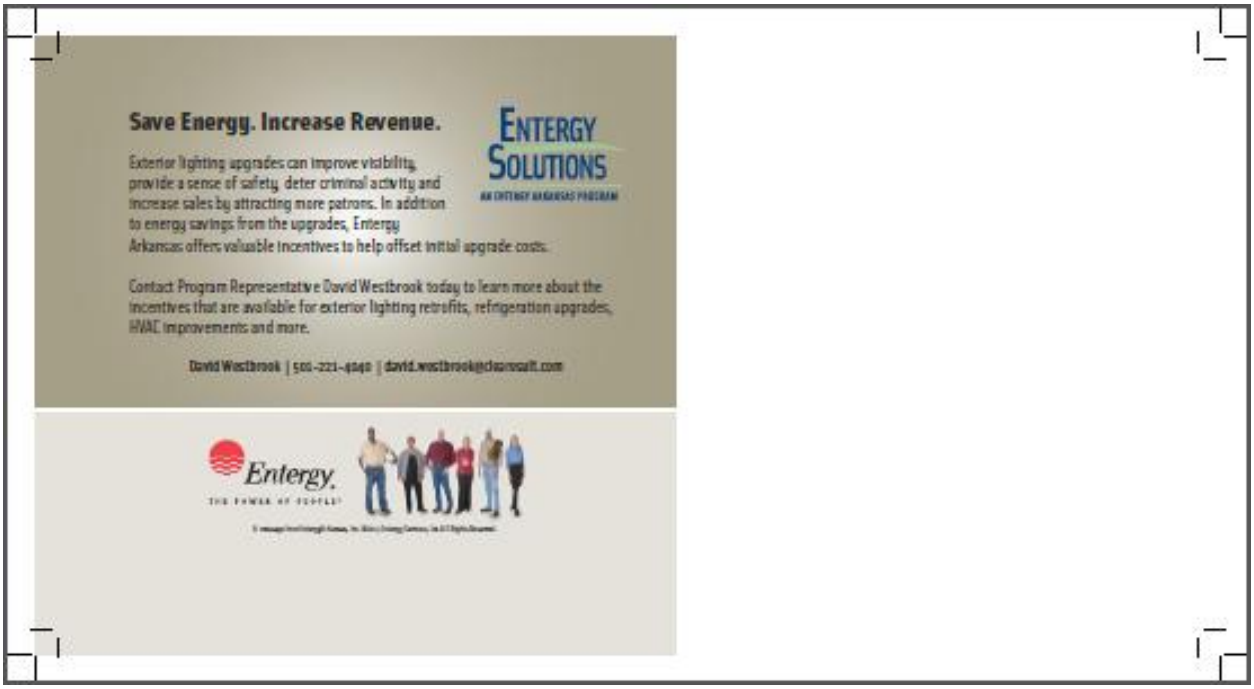
Convenience Store Mailer



Convenience Store Mailer, Reverse



ENAR Lighting Retrofit Flyer

Measure Brief: How a High-efficiency Lighting Retrofit Can Help You Reduce Entergy Bills and Increase Comfort.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Lighting and Your Building

As you probably know, lighting is a significant expense in operating a building and is a key component of each month's Entergy bill. According to ENERGY STAR®, lighting consumes 35 percent of a building's electricity, more than any other end use. Additionally, lighting systems produce large amounts of waste heat, often referred to as heat gain. This internal heat gain may be useful when the building requires heating, but it is counterproductive when the building requires cooling.

How Will I Benefit?

- With good design, lighting energy use in most buildings can be cut at least in half while maintaining or improving lighting quality.
- Projects typically pay for themselves in energy savings alone within a few years; however, Entergy offers incentives to help offset the initial cost.
- Lighting retrofits offer the potential for lower cooling costs, more productive work environments and improved comfort.

Source: ENERGYSTAR.gov

Let's Talk Process

- Once you've enrolled in one of Entergy's commercial and industrial programs, one of our program representatives will perform an on-site, room-by-room inspection of the existing lighting system in your facility – at no cost to you.
- After evaluating your facility's lighting system in its entirety – including the different types of fixtures used throughout, number of lamps, hours of operation and existing light levels – our program representative will compare the data gathered to industry standards.
- Finally, you will receive a customized list of recommendations. This list prioritizes projects that, if implemented, will increase efficiency, significantly reduce your Entergy bills and improve lighting quality and comfort. We will provide a list of qualified participating contractors enrolled in Entergy Arkansas' Entergy Solutions Programs to install the upgrades.
- You'll receive cash incentives for any qualified completed projects.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/largeprescriptive.

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INTERESTING FACTS

- Lighting uses about 18 percent of the electricity generated in the U.S.
- Lighting in commercial buildings accounts for approximately 71 percent of overall lighting electricity use in the U.S.
- Improved lighting enhances visual comfort, reduces eye fatigue and improves performance on visual tasks.

ENAR Lighting Controls Flyer

Measure Brief: Waste Significantly Less Energy with a Lighting Controls Device.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Lighting and Your Building

As you probably know, lighting is a significant expense in operating a building and is a key component of each month's Entergy Arkansas bill. According to ENERGY STAR®, lighting consumes 35 percent of a building's electricity, more than any other end use. Lighting sensors are lighting control devices that allow you to better manage your energy use by automatically turning lights on and off based on space needs. Using infrared or ultrasonic technology, occupancy sensors provide automatic control. Similarly, daylight controls provide automatic control based on incoming natural light.

How Will I Benefit?

- Occupancy sensors provide convenience by turning lights on automatically when someone enters a room and save energy by turning lights off soon after the last occupant has left the room.
- Projects typically pay for themselves in energy savings alone within a few years; however, Entergy offers incentives to help offset the initial cost.

Source: ENERGYSTAR.gov

Ultrasonic vs. Infrared

- Ultrasonic sensors detect sound, while infrared sensors detect heat and motion.
- Occupancy sensors must be located where they will detect occupants or occupant activity in all parts of the room.

Let's Talk Process

- Once you've enrolled in one of Entergy's commercial and industrial programs, one of our program representatives will perform an on-site, room-by-room inspection of the existing lighting system in your facility – at no cost to you.
- Next, you will receive a customized project recommendation – specific to your lighting system.
- We will provide a list of qualified participating contractors enrolled in Entergy Arkansas' Entergy Solutions Programs to install your occupancy sensors.
- You'll receive cash incentives for any qualified completed projects.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/commercial.

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INTERESTING FACTS

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- Improved lighting enhances visual comfort, reduces eye fatigue and improves performance on visual tasks.

ENAR Exterior Lighting Flyer

Measure Brief: Exterior Lighting Improvements

Reduce Energy Costs and Improve Lighting Quality.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Exterior Lights and Your Building

According to the U.S. Congress, outdoor lighting represents approximately 20 percent of all electricity consumed for lighting purposes in the United States. Exterior lighting retrofits help reduce electricity usage while simultaneously improving visibility, providing a sense of safety, deterring criminal activity and creating an attractive environment that will draw shoppers or patrons to a facility.

How Will I Benefit?

- Exterior lighting retrofits enable you to take advantage of technology that – in recent years – has become an affordable alternative to traditional high-wattage metal halide and high-pressure sodium lighting. Light-emitting diode lamps are one such technology; according to the U.S. Department of Energy, numerous pilot projects have shown that LED lamps can be used to obtain cost-effective savings from reduced power draw. Induction lighting and reduced-wattage metal halides are other affordable options.

Let's Talk Process

- Once you've enrolled in one of Entergy's commercial and industrial programs, one of our program representatives will perform an on-site inspection of the existing exterior lighting at your business or facility – at no cost to you.
- Next, you'll receive a customized project recommendation that's specific to your facility's exterior lighting system and will help you prioritize projects that, if implemented, will increase efficiency, improve lighting quality and reduce your monthly Entergy Arkansas bill.
- Upon request, we'll also provide a list of participating contractors who are enrolled in Entergy Arkansas' Entergy Solutions Program and are qualified to install the recommended upgrades.
- You'll receive cash incentives for any qualified completed projects.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/largeprescriptive.

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INTERESTING FACTS

- Lighting aimed in the wrong direction can cause glare that may hinder security personnel's ability to identify people and objects.
- Outdoor high-intensity discharge lamps with specific orientations can produce 10 – 20 percent more light and last up to 60 percent longer than universal-position lamps.
- Outdoor LED lamps can last an average of 26,000 hours longer than traditional high-pressure sodium lamps.

Source: U.S. Department of Energy

ENAR Injection Molding

Measure Brief: Waste Significantly Less Energy with Injection Molding Optimization.

Injection Molding and Your Facility

The United Sates is home to over 7,000 manufacturing plants that house more than 86,000 injection molding machines. These machines use around 30 billion kWh of energy every year. One way to reduce energy waste in your facility is to optimize injection molding processes, which require a substantial amount of energy to keep thermoplastic material pliable before it's injected into the mold cavity.

Source: California Energy Commission

How Will I Benefit?

- Heater barrel improvements can improve efficiency and save energy. These include upgrading heater barrel insulation, ceramic heater bands, integrated electric resistance bands and induction heater bands.
- Energy consumption can also be significantly reduced through injection molding optimization measures such as replacing hydraulic pumps with electric pumps. According to research conducted at the Massachusetts Institute of Technology, electric injection molding pumps use 50 percent less energy than hydraulic pumps.

Let's Talk Process

- Once you've enrolled in one of Entergy Arkansas' commercial and industrial programs, one of our program representatives will perform an on-site analysis of your injection molding system – at no cost to you.
- Next, you'll receive customized recommendations that are specific to your facility's injection molding system and will help you prioritize projects that, if implemented, will increase efficiency and reduce your monthly Entergy Arkansas bill.
- Upon request, we'll also provide you with details about participating contractors who are enrolled in Entergy Arkansas' Entergy Solutions Program and are qualified to install the recommended upgrades.
- You'll receive cash incentives for any qualified completed projects.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420 or visit **entergyarkansas.com/largecustom.**

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INTERESTING FACTS

- According to ENERGY STAR®, a plastics factory in Scotland modified its facility so that waste heat from plastic injection molding machines could be used to provide space heating. The payback period for the project was only 6-7 months, and it resulted in annual energy savings of over 3.2 TBtu.
- Electric injection molding pumps use 50 percent less energy than hydraulic pumps, according to research conducted at the Massachusetts Institute of Technology.

ENAR Kitchen Ventilation

ENTERGY SOLUTIONS

Measure Brief: Kitchen Ventilation Controls Help You Reduce Your Entergy Arkansas Bill and Increase Efficiency.

Ventilation Controls and Your Kitchen

Kitchen ventilation improvements can help reduce energy consumption in restaurants, which use about 2.5 times more energy per square foot than other commercial buildings. Typical kitchen ventilation controls have only two modes: on and off. This means that when a kitchen ventilation hood is on, fans and motors operate continuously at the rate needed to maintain maximum airflow, even though the actual demand for exhaust could be much lower. Entergy Arkansas offers incentives to help you install demand-based kitchen ventilation controls that adjust fan and motor operation rates on a continual basis, ultimately reducing your monthly energy costs.

How Will I Benefit?

- Demand-based kitchen ventilation controls can reduce your exhaust system costs by 30 to 50 percent and can be installed on new or existing hoods.
- Proper kitchen ventilation can help reduce cross-drafts and building pressure problems. This will lower your air conditioning costs and create a more comfortable environment for your customers.
- Kitchen ventilation upgrades typically pay for themselves within a few years due to energy savings.

Let's Talk Process

- Once you've enrolled in one of Entergy Arkansas' commercial and industrial programs, one of our program representatives will perform an on-site inspection of your commercial kitchen – at no cost to you.
- After evaluating your kitchen's ventilation system, our program representative will compare the data to industry standards and provide you with a customized list of recommendations. This list will help you prioritize projects that, if implemented, will increase the efficiency of your facility, create a more comfortable environment for your customers and reduce your monthly Entergy Arkansas bill.
- We'll also provide a list of participating contractors who are enrolled in Entergy Arkansas' commercial and industrial programs and are qualified to install the recommended upgrades.

For more information, please call the Energy Efficiency Solutions Center at 877-212-2420
or visit entergyarkansas.com /largeprescriptive.

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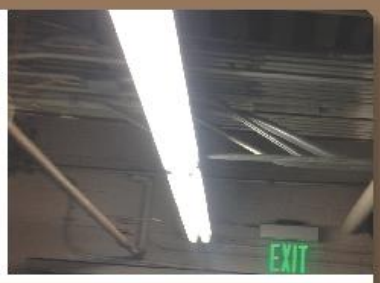
DID YOU KNOW?

- According to Pacific Gas and Electric's Food Service Technology Center, the commercial food service sector spends $10 billion on energy each year, and could reduce its annual energy use by 80 percent – or $8 billion – by eliminating inefficient food cooking, holding and storage equipment.
- Restaurants that invest in strategic energy efficiency improvement can contribute to a cleaner environment and cut utility costs by 10 to 30 percent without sacrificing service, quality, style or comfort.

Source: energystar.gov

C&I Case Study: Metropolitan Bank



CASE STUDY

Metropolitan National Bank Building

PROJECT AT A GLANCE:

Annual kWh reduction:	2,469,066
Estimated annual savings:	$160,489
Total project incentive:	$426,377
Payback period:	<7 years

THE OPPORTUNITY

Metropolitan National Bank Building, a 40-story skyscraper, is the tallest building in Little Rock. Keeping the satisfaction and comfort of the tower's tenants, employees and customers in mind, building owner Capitol Avenue Development determined the 26-year-old building needed an energy efficiency makeover.

ENTERGY SOLUTIONS

Measure	Savings (kWh/year)
Lighting Retrofit (Exit, elevator lights)	215,085
Chiller Replacement	388,688
Chilled Water Pump (VFD)	132,840
Chiller Controls	1,316,404
Direct Install Measures (Low-flow aerators)	399,486
Lighting Controls	16,563
Total	2,469,066

THE PROJECT

Taking a comprehensive approach, decision makers worked with the Large Commercial & Industrial Program team to target multiple areas of improvement. The engineering support combined with technical and financial analysis provided by the program allowed decision makers to secure approval of multiple projects, including high-efficiency lighting upgrades and replacements, HVAC upgrades and chiller replacements. In addition, the program team installed lighting controls and no-cost electricity - and water-saving devices that further reduced energy use.

THE RESULTS

While the implementation of these projects resulted in significant annual savings and increased energy efficiency, what's most notable about Capitol Avenue Development's participation is that these savings are equivalent to eliminating the carbon dioxide emissions from 363 passenger vehicles. Lastly, the incentives earned combined with annual energy savings yields a short ROI of less than seven years on a project with an expected life of 30 years or longer.

To learn more about the Large Commercial & Industrial Program, visit entergyarkansas.com/commercial.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/commercial.

C&I Case Study: Mark Martin Dealership

CASE STUDY

Mark Martin Dealership

PROJECT AT A GLANCE:

Annual kWh reduction:	285,696 kWh
Total fixtures replaced:	90
Estimated annual savings:	$19,427
Total project incentive:	$25,712
Payback period:	~2 years

THE OPPORTUNITY

The Entergy Arkansas Large Commercial and Industrial Program helps customers like dealership owner and NASCAR driver Mark Martin operate facilities more efficiently by increasing energy efficiency. In an effort to achieve significant, long-term electricity savings, Martin enlisted the help of the program team and a local lighting contractor to explore savings opportunities at his dealership.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

THE PROJECT

While projects using LED bulbs are less common, Martin was intrigued by the notion that while the capabilities of LED products are increasing, the prices are decreasing. So, rather than implementing a traditional lighting retrofit using CFL, T12 or T8 light bulbs, Martin and the program team decided to replace all 1000 Watt metal halide fixtures in the exterior parking lot with 284 Watt LED fixtures. The project would not have been possible without a demonstrated annual savings and program incentive that would yield a short payback period.

THE RESULTS

As shown above, the lighting upgrade resulted in significantly increased energy efficiency and an ROI that worked with the Martin's budget. Most notably, the savings achieved are equivalent to eliminating the annual greenhouse gas emissions from 42 passenger vehicles, according to the Environmental Protection Agency.

To learn more about the Large Commercial and Industrial Prescriptive Program, visit **entergyarkansas.com/commercial**.

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C&I Case Study: Schulze & Burch Biscuit Co

CASE STUDY

Schulze & Burch Biscuit CO.

PROJECT AT A GLANCE:

Total peak kW reduction:	96 kW
Total kWh reduction:	807,361 kWh
Estimated annual savings:	$56,515
Total project incentive:	$164,479
Payback period:	1.002 years

THE OPPORTUNITY

While Schulze & Burch Biscuit Company is typically recognized for being a pioneer and innovator in baking technology, it will now be known for its highly efficient facility and commitment to energy efficiency. When Director of Technical Services, Alan Freeland, was introduced to the Large Commercial & Industrial Program, he took a comprehensive approach to participation – ensuring every benefit of the program was optimized.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

THE PROJECTS

Rather than focusing on one area of improvement, Freeland worked with program representatives to identify six different projects. The engineering support and technical and financial analysis provided by the program allowed Freeland to secure approval of projects that otherwise would have not moved forward. Schulze & Burch's projects included energy-efficient upgrades to the facility's lighting technology, air compressor, HPLV fans and building envelope. In addition, the program team installed lighting controls and no-cost electricity- and water-saving devices that further reduced energy and natural gas use.

THE RESULTS

While the implementation of these projects resulted in significant annual savings and increased energy efficiency, what's most notable about Schulze & Burch's participation is that the earned incentives covered 75 percent of the combined project cost. In terms of conservation, these measures are equivalent to eliminating the carbon dioxide emissions from the energy use of 29 homes for one year.

To learn more about how the Large Commercial & Industrial Custom Program can help your company, visit entergyarkansas.com/commercial.

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C&I Case Study: Victory Building

CASE STUDY

Arkansas Teacher Retirement System

PROJECT AT A GLANCE:

Annual kWh reduction:	376,979
Total fixtures replaced:	321
Estimated annual savings:	$22,618
Total project incentive:	$33,928
Payback period:	7.2 months

THE OPPORTUNITY

The Entergy Arkansas Large Commercial and Industrial Program helps organizations like the Arkansas Teacher Retirement System achieve significant, long-term electricity savings through the identification and implementation of energy efficiency upgrade projects. Knowing potential savings existed, Property Manager, Dana Gray enlisted the help of the program team to determine ways to reduce energy consumption in the facility's parking garage.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

THE PROJECT

To achieve maximum savings, the program team worked with a local contractor to replace all existing high-intensity discharge fixtures with high-efficiency T8 fixtures. Due to advances in fluorescent lighting technology, T8 fixtures are now capable of producing the lumen output of HID fixtures while significantly reducing energy consumption – sometimes by more than 60 percent. Additionally, the new fluorescent fixtures brighten the once dim garage, making it safer and easier to use.

THE RESULTS

The project would not have been possible without a demonstrated annual savings and program incentive that would yield a short payback period. As shown above, replacing the existing fixtures resulted in significantly increased energy efficiency and a quick ROI. Even more important, the savings achieved are equivalent to the greenhouse gas emissions avoided by recycling 99.6 tons of waste instead of sending it to the landfill, according to the Environmental Protection Agency.

To learn more about the Large Commercial and Industrial Program, visit **entergyarkansas.com/commercial**.

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/commercial.

2.7 Lighting and Appliances

L&A Fact Sheet

FACT SHEET: 2011-2013 Lighting and Appliances Program

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

The objective of the Lighting and Appliances program is to increase awareness and sales of efficient lighting and appliances to the Entergy Arkansas residential customers. The program will offer customers the opportunity to purchase, largely through retail locations, a variety of discounted products that are ENERGY STAR® qualified or better.

What are the Benefits?

- Receive cash incentives in the form of instant savings at participating retailers.
- Achieve energy savings for a quick return on your investment.
- Decrease your energy bills each month.
- Improve indoor light and air quality.
- Reduce your carbon footprint.

Who is Eligible?

Residential customers (renters or owners) who are current Entergy Arkansas customers.

How to Participate:

Receive instant savings at the cash register of participating retailers with the purchase of select ENERGY STAR compact fluorescent light bulbs, light fixtures and room air conditioners. This program replaces the coupons you previously received twice a year with your bill. For a list of participating retailers, contact the Energy Efficiency Solutions Center toll free at 877-212-2420, or visit **entergyarkansas.com/homeappliances.**

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/homeappliances.

L&A Fact Sheet, Reverse

Typical Single-Family Home Project:

The more ENERGY STAR compact fluorescent light bulbs, light fixtures and room air conditioners you install, the more you save. Below is an example of the incentives you might receive by participating in the program:

Existing Item Being Replaced	Measures Installed	Annual Energy Savings (kWh)	Annual Energy Savings	Total Incentive Amount	Est. Purchase Cost	Est. Simple Payback
6 Standard 75W incandescent light bulbs	6 ENERGY STAR qualified 26W CFLs	366 kW/h	$38	$9	$12	0.1 years
3 Traditional three-lamp fixtures and 3 traditional one-lamp fixtures, all with incandescent bulbs	6 CFLs (3 three-lamp and 3 one-lamp)	447 kW/h	$47	$75	$180	2.2 years
2 Traditional ceiling fans with light kits, with incandescent bulbs	2 ENERGY STAR qualified ceiling fans with light kits, CFLs used	284 kW/h	$30	$50	$136	2.9 years
2 Traditional room air conditioners	2 ENERGY STAR qualified ceiling fans with light kits, CFLs used	514 kW/h	$54	$60	$200	2.6 years
	TOTALS	1,611 kWh	$169	$194	$528	

Entergy Arkansas does not warrant or endorse any manufacturer. Programs is subject to limitation, change and/or termination at any time. These incentives and savings amounts are based on a typical Arkansas home. Every home is different; incentive and savings amounts will vary based on pre-existing home conditions, customer behavior and measures installed.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/homeappliances.

L&A FAQ

Entergy Arkansas
Lighting & Appliances Program
2011-2013

Frequently Asked Questions

ENERGY STAR® ROOM AIR CONDITIONERS

Entergy Arkansas offers customers up to $35 off the purchase of ENERGY STAR® qualified room air conditioners at participating retailer locations.

Q. Why buy ENERGY STAR?

A. To qualify for the ENERGY STAR label, room air conditioners must meet current ENERGY STAR standards, meaning they surpass current minimum federal energy efficiency standards by at least 10 percent. Additionally, these units will save their owners an average of $50 over the lifetime of the machine, and often include more features, such as timers, digital displays, remote controls and directional vents. A list of qualifying models can be found at www.energystar.gov.

Q. Who is eligible for the program?

A. Entergy Arkansas residential customers (renters or owners) who shop at participating retail locations.

Q. When is the program available?

A. The program begins in May 2013 and runs through Sept. 1, 2013, or until program funds are depleted.

Q. How will I know when the program has ended?

A. Effective dates of the program, and other information, can be found at **www.entergyarkansas.com/homeappliances.**

Q. What if I purchased an ENERGY STAR unit before the program began?

A. Because the program is designed as an instant-savings promotion, any purchases made before the promotional period will not qualify for a rebate.

Q. What if I purchased an ENERGY STAR unit during the promotional period, but not at a participating retail location?

A. Only participating retailers have been set up to offer the discount. Therefore, any room air conditioner not purchased at a participating retail location, regardless of efficiency, will not be discounted.

Q. Where can I find a list of participating retailers?

A. A list of participating retailers can be found on Entergy Arkansas's Lighting & Appliances Program webpage at **entergyarkansas.com/ homeappliances.**

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Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/homeappliances.

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L&A FAQ, page 2

ENERGY STAR LIGHT FIXTURES

Entergy Arkansas offers customers up to $25 off the purchase of ENERGY STAR qualified compact fluorescent light fixtures at participating retailer locations.

Q. Why buy ENERGY STAR?

A. ENERGY STAR qualified fixtures:

- Use a fourth of the energy of traditional lighting.
- Save money on energy bills and bulb replacements with bulbs that last between 10,000 – 50,000 hours (about seven - 22 years of regular use).
- Distribute light more efficiently and evenly than standard fixtures.
- Come in hundreds of decorative styles including portable fixtures – such as table, desk and floor lamps – and hard-wired options such as front porch, dining room, kitchen ceiling and under-cabinet, hallway ceiling and wall, bathroom vanity fixtures, and more. A list of qualifying fixtures can be found at: www.energystar.gov.

Q. What if I purchased ENERGY STAR light fixtures before the program began?

A. Because the program is designed as an instant-savings promotion, any purchases made before the promotional period will not qualify for a rebate.

Q. What if I purchased ENERGY STAR qualified light fixtures during the promotional period, but not at a participating retail location?

A. Only participating retail stores have been set up to offer the discount. Therefore, any fixtures not purchased at a participating retail location, regardless of efficiency, will not be discounted.

Q. Where can I find a list of participating retailers?

A. A list of participating retailers can be found on Entergy Arkansas' Lighting & Appliances Program webpage at **www.entergyarkansas.com/homeappliances.**

ENERGY STAR COMPACT FLUORESCENT LIGHT BULBS

Entergy Arkansas offers customers up to $12 off the purchase of ENERGY STAR qualified packs of CFLs at participating retailer locations.

Q. Why buy ENERGY STAR?

A. To qualify for the ENERGY STAR label, CFLs must meet current ENERGY STAR standards, meaning they use about 75 percent less energy than traditional incandescent bulbs and last about six times longer. These bulbs will save their owners about $40 in electricity costs over their lifetime, and produce about 75 percent less heat, so they're safer to operate and can help cut energy costs associated with home cooling. A list of qualifying bulbs can be found at www.energystar.gov.

Q. What if I purchased ENERGY STAR light bulbs before the program began?

A. Because the program is designed as an instant-savings promotion, any purchases made before the promotional period will not qualify for a rebate.

Q. What if I purchased ENERGY STAR qualified bulbs during the promotional period, but not at a participating retail location?

A. Only participating retail stores have been set up to offer the discount. Therefore, any light bulbs not purchased at a participating retail location, regardless of efficiency, will not be discounted.

Q. Where can I find a list of participating retailers?

A. A list of participating retailers can be found on Entergy Arkansas' ENERGY STAR Appliances Program webpage at **www.entergyarkansas.com/homeappliances.**

The following are frequently asked questions about CFLs that can be found on ENERGY STAR's website at www.energystar.gov.

Q. Can I turn my compact fluorescent light bulbs (CFLs) on and off frequently? I've been told I have to turn it on and leave it on all day.

A. Turning a CFL on and off frequently can shorten its life. However, because of the vast diversity of products and different usages, it is difficult to determine exactly how much. ENERGY STAR specifications require bulbs to endure rapid cycling for five minute intervals to ensure that the products can hold up to frequent switching.

To take full advantage of the energy savings and long life of ENERGY STAR qualified CFLs, it is best to use them in light fixtures you use the most and are on for at least 15 minutes at a time. This is not to

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L&A FAQ, page 3

say you should leave your lights on all day if you use ENERGY STAR qualified CFLs. It is still a good habit to turn the lights off when you leave the room for an extended period of time.

You may also have heard that CFLs use a lot of energy when turning on and off. While there is a brief surge in energy use when a CFL is turned on, with today's starting technology, that surge usually lasts about a tenth of a second and consumes about as much energy as five seconds of normal operation. So, even when turned on and off frequently, a CFL uses less energy than its incandescent equivalent. But because turning a CFL on and off more frequently can shorten its life and CFLs are more expensive than incandescent bulbs, we recommend consumers use CFLs in applications where they are on for at least fifteen minutes.

Q. Can I use a CFL that is not specifically designed to work in a dimmable light fixture, in a dimmable fixture as long as I don't use the dimmable feature?

A. In principle, if you NEVER dim the light, a CFL should work appropriately. However, because of the risk of users dimming the switch even accidentally, this is not something we recommend. Additionally, using a CFL on a dimming switch will likely void the product warranty even if the switch is never dimmed. If you wish to use a CFL on a dimmer, we recommend that you look for bulbs that indicate they are compatible with dimmers on their packaging.

Q. Can CFLs be used in recessed cans, outdoor lights or track lighting?

A. Yes! Always read the packaging of the CFL to be sure of its proper application, but there are a wide variety of ENERGY STAR qualified CFLs that are designed for use in most fixtures in your home, including recessed cans, outdoor lights, and track lighting. Most of these types of bulbs are incentivized as part of the Entergy Arkansas program.

Q. What are the mercury emissions associated with CFLs?

A. EPA estimates the U.S. is responsible for the release of 103 metric tons of mercury emissions each year. More than half of these emissions come from coal-fired electrical power. Mercury released into the air is the main way that mercury gets into water and bio-accumulates in fish. (Eating fish contaminated with mercury is the main way for humans to be exposed.)

CFLs contain a very small amount of mercury sealed within the glass tubing - an average of 4 milligrams. Because of this, EPA recommends that consumers take advantage of available local recycling options for CFLs. But if the CFL is not recycled and it ends up in a landfill, EPA estimates that about 11 percent of the mercury in the CFL is released into air or water, assuming the light bulb is broken. This is because most mercury vapor inside fluorescent light bulbs becomes bound to the inside of the light bulb. Therefore, if all 270 million CFLs sold in 2009 were sent to a landfill (versus recycled, as a worst case) - they would add only 0.12 metric tons, or 0.12 percent, to U.S. mercury emissions caused by humans.

BELOW ARE SOME FACT ABOUT CFLS AND MERCURY

Using CFLs reduces the amount of mercury released into the environment

- Mercury is found in many rocks including coal. When coal is burned at a utility power plant to produce electricity, mercury is released into the environment.
- Coal-burning power plants are the largest man-made source of mercury emissions to the air in the United States, accounting for about half of all domestic human-caused mercury emissions (source: 2005 National Emissions Inventory).
- Using energy-efficient CFLs reduces demand for power, which in turn reduces the amount of mercury released into the environment by coal-burning power plants.

CFLs contain very small amounts of mercury

- Mercury, an essential part of CFLs, allows a bulb to be an efficient light source.
- On average, CFLs contain about four milligrams of mercury sealed within the glass tubing. By comparison, older thermometers contain about 500 milligrams of mercury – an amount equal to the mercury in more than 100 CFLs. · Manufacturers of fluorescent lighting products are working to reduce the amount of mercury content in CFLs.
- No mercury is released when the bulbs are intact (i.e., not broken) or in use, but CFLs release mercury vapor when broken.

Q. Why use CFLs if they contain mercury?

A. Small amounts of mercury can be released into the environment when CFLs break, or if they are improperly disposed of at the end of their useful lives. The total amount of mercury that could be released

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L&A FAQ, page 4

into the environment through breakage and improper disposal, however, is small compared to the amount of mercury that doesn't get released into the environment because Americans are choosing energy-efficient CFLs, reducing demand for electricity.

PROGRAM MANAGEMENT & CONTACT

Effie Weaver
Phone: 512-416-5964
Email: eweaver@CLEAResult.com
Energy Efficiency Solutions Center
Phone: 1-877-212-2420

PROGRAM PARTICIPATION

Entergy Arkansas customers can participate in the program by purchasing ENERGY STAR CFLs and CF fixtures from participating retailers.

PARTICIPATING RETAILERS AND MANUFACTURERS

Participating Retailers: Responsible for complying with program processes agreed to in the memorandum of understanding (MOU). This can include tracking and reporting sales figures for each measure, customer education, signage and monthly reporting to CLEAResult, the program administrator.

Participating Manufacturers: Responsible for complying with program processes agreed to in the MOU. This can include all of the above responsibilities plus fulfilling orders for products placed on the web from Entergy Arkansas customers who purchase advanced power strips at a reduced cost. Manufacturer must ensure all products sold to retailer for purposes of the promotion will comply with the current ENERGY STAR (or other agreed upon) qualifications and are listed on the ENERGY STAR website.

CUSTOMER ELIGIBILITY

The 2013 Residential Lighting & Appliances Program offered to all residential and small business customers. Customers may be required to verify eligibility with their Entergy Arkansas account number.

DISCLAIMERS:

The selection of a participating retailer's or manufacturer's product is the sole decision of the customer. Inclusion of a retailer or product in the program does not constitute an endorsement by Entergy Arkansas or CLEAResult of any product, individual or company. Neither Entergy Arkansas nor CLEA Result makes any guarantee or any other representation or warranty, expressed or implied or otherwise, as to the quality, cost or effectiveness of any product(s) provided by any such Participating Retailer's employees, subcontractors or suppliers.

Energy efficiency gains are subject to a number of variable conditions and circumstances. While it is the intent of the program to achieve energy efficiencies, neither Entergy Arkansas nor CLEA Result guarantees or warrants that any specific energy efficiency gains will be achieved for a particular customer under the Program.

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L&A Data Collection Card

Stop wasting money. ENTERGY SOLUTIONS

Entergy Account Holder Name: _____

Account Phone Number: _____

Service Address: _____

Would you like to be contacted about receiving a home energy audit? Check if yes. ( )

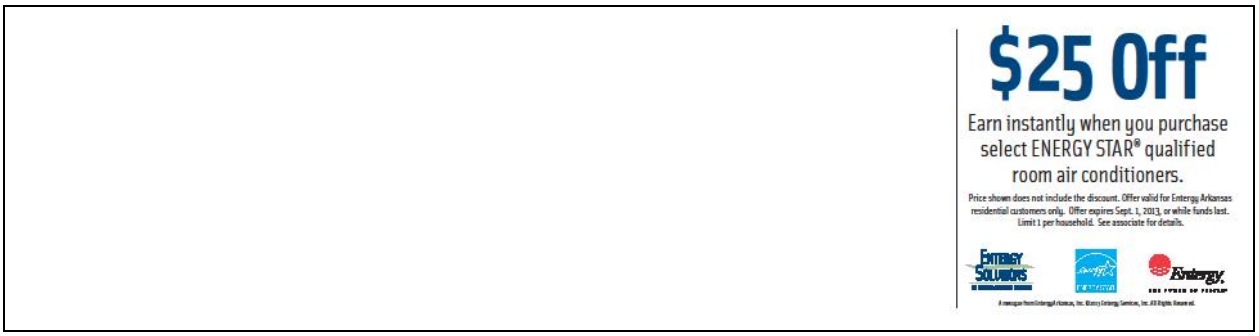
Would you like to be contacted about receiving a free air conditioner tune-up? Check if yes. ( )

How many CFL bulbs do you currently have installed in your home? _____

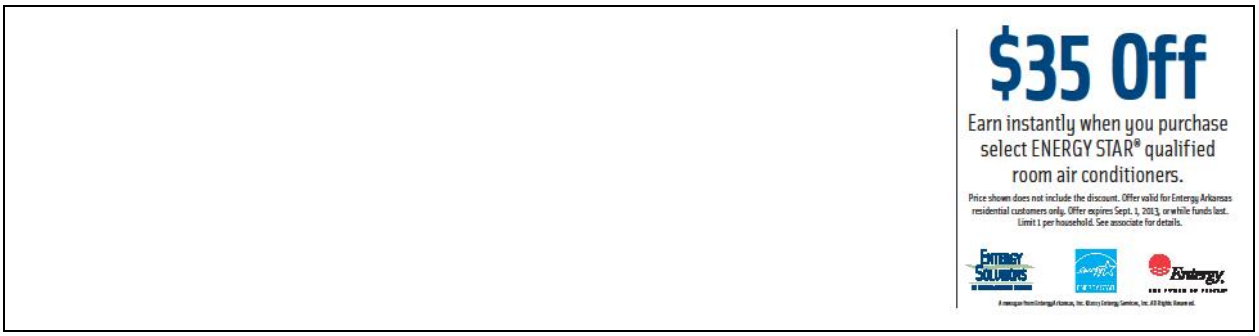
L&A Walmart POP

L&A Wing Header Card

L&A Side Kicker $25 Card

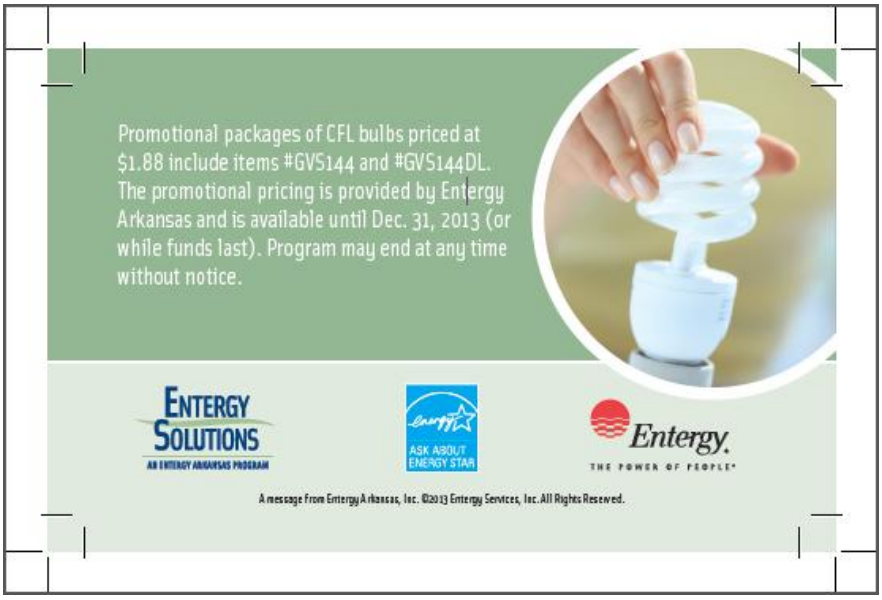


L&A Side Kicker $35 Card

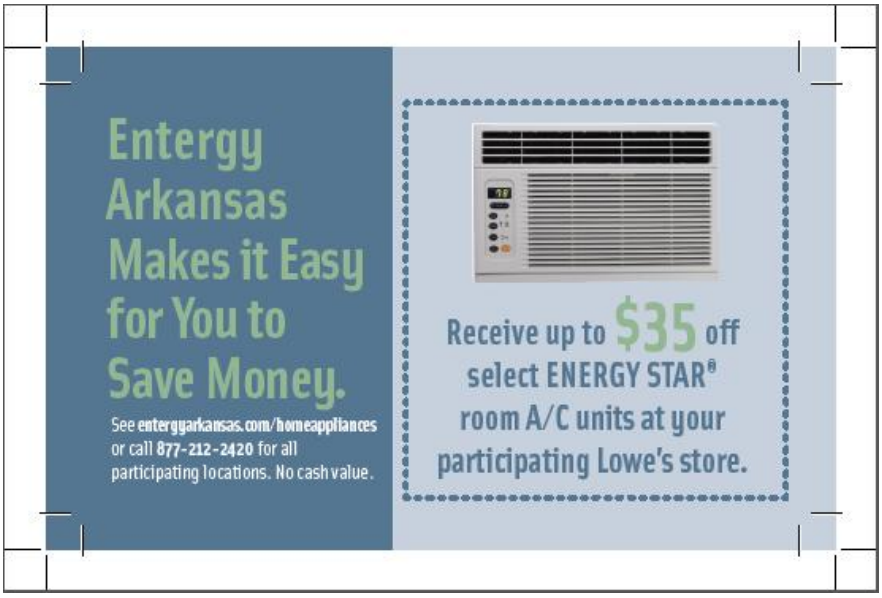


L&A Promo Cards

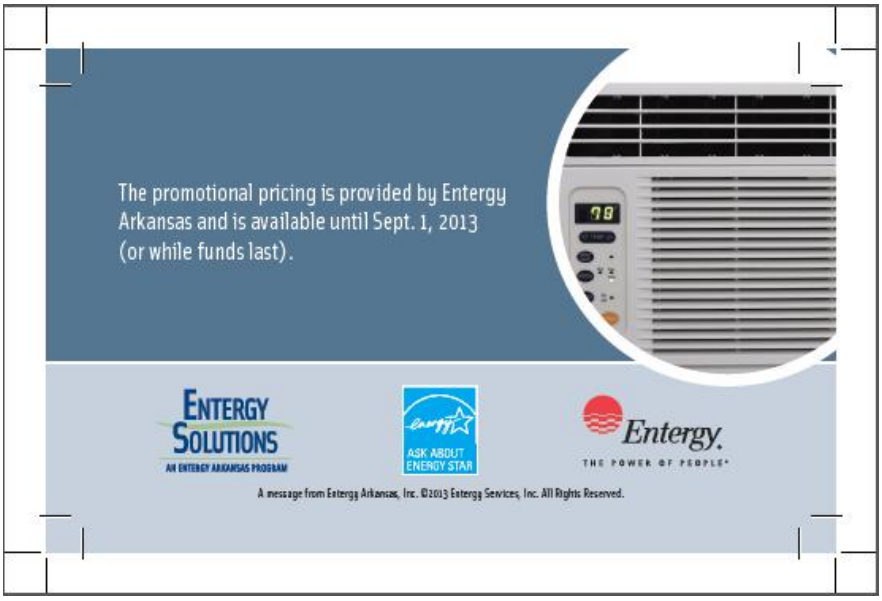
L&A Promo Cards, 2



L&A Promo Cards, 3

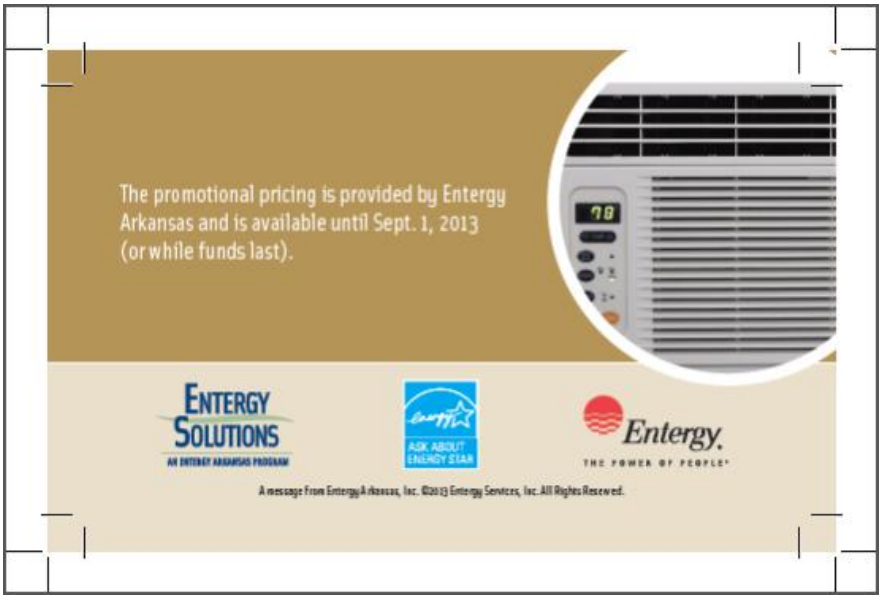


L&A Promo Cards, 4



L&A Promo Cards, 5

L&A Promo Cards, 6



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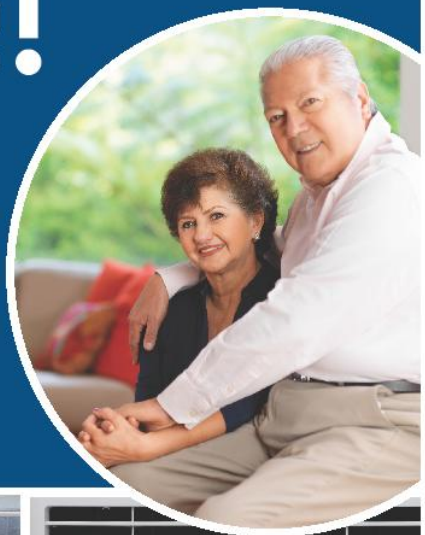
L&A Window Cling

Beat the Heat and Save!

Save up to **$35** on select ENERGY STAR® qualified room air conditioners.



Price shown does not include the discount. Signs with the Entergy logo indicate products that qualify. Offer valid for Entergy Arkansas residential customers only. Offer available while supplies and funds last or until Sept. 1, 2013. Limit one per household. See associate for details.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

energy ENERGY STAR

Entergy.
THE POWER OF PEOPLE®

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L&A Window Cling, Version 2

Don't Miss Your Chance to Save!

Save up to **$35** instantly when you purchase select ENERGY STAR® qualified room air conditioners.

Price shown includes discount. Signs with the Entergy logo indicate products that qualify. Offer valid for Entergy Arkansas residential customers only. Offer available while supplies and funds last or until Sept. 1, 2013. Limit one per household. See associate for details.

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ENERGY STAR

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L&A Fridge FAQ

Entergy Arkansas

Lighting & Appliances Program 2011-2013

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Frequently Asked Questions

ENERGY STAR® REFRIGERATOR MAIL-IN REBATE PROGRAM

Entergy Arkansas provides $75 rebates to customers who purchase qualifying refrigerators via the ENERGY STAR® refrigerator mail-in rebate program. Here are some frequently asked questions about the program.

Q. When can I expect to receive my rebate?

A. Customers can expect to receive their rebate within four to six weeks of the date on which we receive their application, as long as the customer has met all eligibility requirements and has provided all required information as indicated on the rebate application.

Q. Who is eligible for the program?

A. The program is open to all Entergy Arkansas residential customers. Customer status will be verified by the Incentive Processing Center in Michigan upon receipt of a rebate application. In order to be eligible for a rebate, customers must:

- Purchase qualifying equipment, as indicated on the rebate application form.
- Have made the purchase on or before Dec. 1, 2013. To check the status of the program, see the Entergy Arkansas Lighting & Appliances program page: **entergyarkansas.com/homeappliances**.
- Submit a completed program rebate application form (see next page). All rebate forms must be received within 30 days from the purchase date. Rebate applications will not be accepted after Dec. 31, 2013.
- Provide proof of purchase in the form of a receipt or a copy of a receipt. This must be included with the completed rebate application form.

Q. What are the dates of the program?

A. The program begins on Aug. 15, 2013 and runs until Dec. 1, 2013, or until funds are depleted.

Q. Where should I send my rebate application?

A. Customers can mail, fax or email their rebate applications to:
Entergy Arkansas Refrigerator Program
3100 West Rd., Bldg. 3, Ste. 200
East Lansing, MI 48823
(f) 888-668-2907
(e) EAI-Rebate@clearesult.com

Q. Where can I find more information?

A. To learn more about the program, please visit the Entergy Arkansas Lighting & Appliances page at **entergyarkansas.com/homeappliances** or call us toll-free at 877-212-2420.

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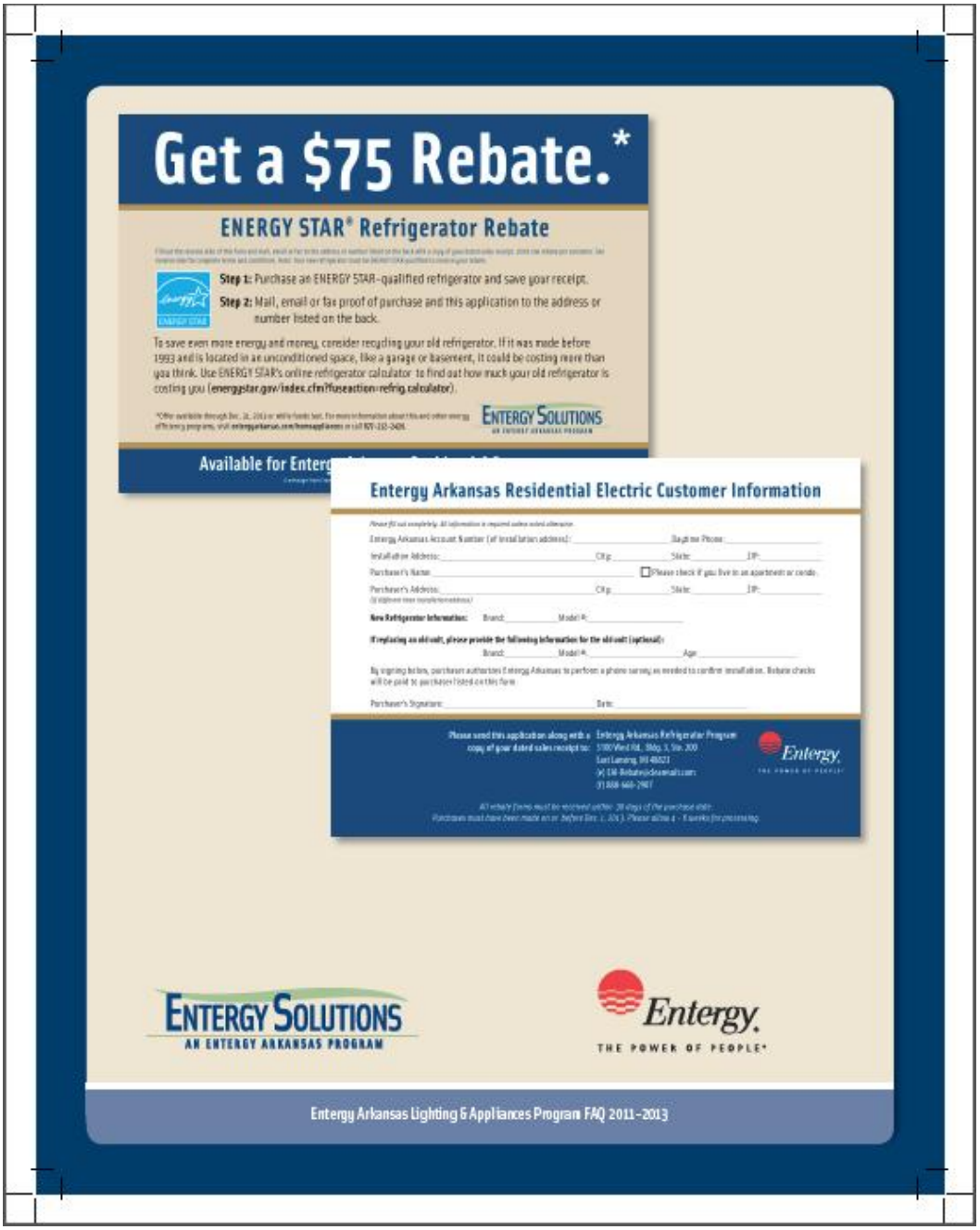
Questions? Contact the Energy Efficiency Solutions Center at 877-212-2420 or visit entergyarkansas.com/homeappliances.

L&A Fridge FAQ, Reverse



Get a $75 Rebate.*

ENERGY STAR® Refrigerator Rebate

Step 1: Purchase an ENERGY STAR-qualified refrigerator and save your receipt.

Step 2: Mail, email or fax proof of purchase and this application to the address or number listed on the back.

To save even more energy and money, consider recycling your old refrigerator. If it was made before 1993 and is located in an unconditioned space, like a garage or basement, it could be costing more than you think. Use ENERGY STAR's online refrigerator calculator to find out how much your old refrigerator is costing you (**energystar.gov/index.cfm?fuseaction=refrig.calculator**).

ENTERGY SOLUTIONS

Available for Enterg

Entergy Arkansas Residential Electric Customer Information

Please fill out completely. All information is required unless noted otherwise.

Entergy Arkansas Account Number (at installation address): _____ Daytime Phone: _____

Installation Address: _____ City: _____ State: _____ ZIP: _____

Purchaser's Name: _____ ☐ Please check if you live in an apartment or condo.

Purchaser's Address: _____ City: _____ State: _____ ZIP: _____
(If different from installation address)

New Refrigerator Information: Brand: _____ Model #: _____

If replacing an old unit, please provide the following information for the old unit (optional):
Brand: _____ Model #: _____ Age: _____

By signing below, purchaser authorizes Entergy Arkansas to perform a phone survey as needed to confirm installation. Rebate checks will be paid to purchaser listed on this form.

Purchaser's Signature: _____ Date: _____

Please send this application along with a copy of your dated sales receipt to: Entergy Arkansas Refrigerator Program
5100 West Rd., Bldg. 3, Ste. 200
East Lansing, MI 48823
(e) EAR-Rebates@examail.com
(f) 888-660-2987

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*All rebate forms must be received within 30 days of the purchase date.
Purchases must have been made on or before Dec. 1, 2013. Please allow 4 - 6 weeks for processing.*

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Entergy Arkansas Lighting & Appliances Program FAQ 2011-2013

L&A Fridge FAQ, 2

$75 back?

Now that's cool.

When you purchase an ENERGY STAR® qualified refrigerator, you may be eligible for a **$75 rebate** from Entergy Arkansas.*

Must be an Entergy Arkansas residential customer to qualify. Limit one rebate per household. Other restrictions apply. Please see rebate application form for more details or visit **entergyarkansas.com/homeappliances.*

Oops!

It looks live we've run out of applications at this location.
You can ask a store associate for an application, or download one from our website at entergyarkansas.com/homeappliances.

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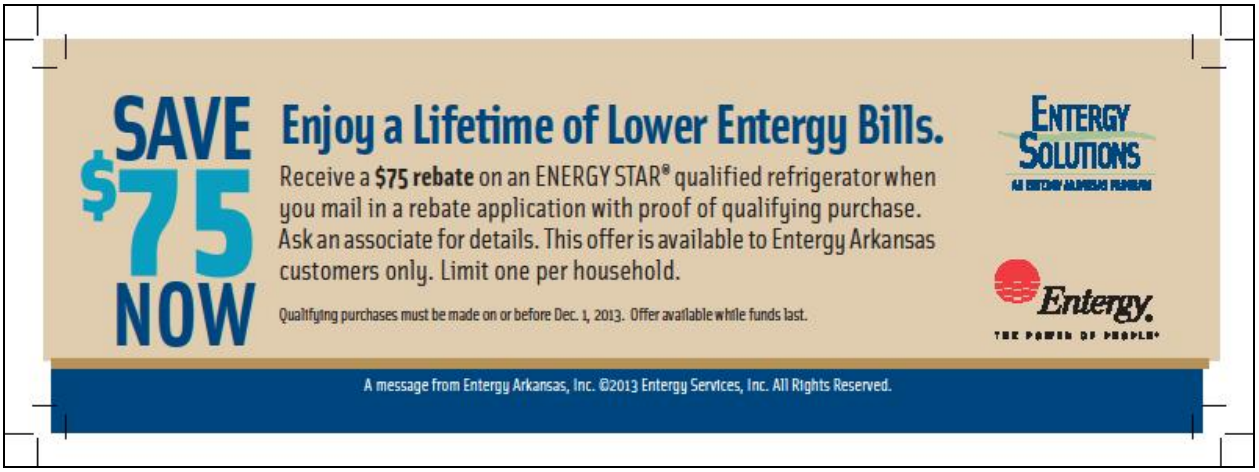
L&A Fridge FAQ, 3



L&A Fridge FAQ, 4

L&A Lowes POS A/C

Save up to $35 instantly on qualifying ENERGY STAR® Room Air Conditioners.

Ahorre hasta $35 de forma instantánea en aires acondicionados para habitación ENERGY STAR que califican.

Price shown includes discount. Look for the utility sticker next to qualifying products.

El precio que se muestra incluye el descuento. Busque el autoadhesivo de servicios públicos cerca de los productos que califican.

This offer is valid for Entergy Arkansas residential customers only. Offer expires Sept. 1, 2013, or while funds last. Limit 1 per household.

LEARN MORE AT energystar.gov

Oferta válida sólo para clientes residenciales de Entergy Arkansas. La oferta vence el 1 de septiembre de 2013 o hasta el agotamiento de los fondos. Límite de 1 por domicilio.

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LOWE'S

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L&A Lowes POS CFL

L&A Lowes POS Fridge

$75 back? Now that's cool.

¿$75 de reembolso? Eso está genial.

LEARN MORE AT energystar.gov

When you purchase an ENERGY STAR® qualified refrigerator and have your old unit hauled away by the retailer, you may be eligible for a $75 rebate from Entergy Arkansas.

Cuando compra un refrigerador con calificación ENERGY STAR y es el distribuidor el que retira su unidad antigua, usted puede recibir un reembolso de $75 de Entergy Arkansas.

Must be an Entergy Arkansas residential customer to qualify. Limit 2 rebates per household. Other restrictions apply. Please see rebate application form for more details, or visit **entergyarkansas.com/homeappliances.**

Para calificar, debe ser cliente residencial de Entergy Arkansas. Límite de 2 reembolsos por domicilio. Se aplican otras restricciones. Si desea más información, consulte el formulario de aplicación para el reembolso o visite **entergyarkansas.com/homeappliances.**

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LOWE'S

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L&A Lowes POS Light Fixtures

L&A Lowes Mailer

L&A Lowes Mailer, Reverse

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L&A Table Top A/C

Don't Miss Your Chance to Save!

Save up to **$35** instantly when you purchase select ENERGY STAR® qualified room air conditioners.

Offer available while supplies last. Price shown includes discount. Signs with the Entergy logo indicate qualified products. Offer valid for Entergy Arkansas residential customers only. Offer available while supplies and funds last or until Sept. 1, 2013. Limit one per household. See associate for details.

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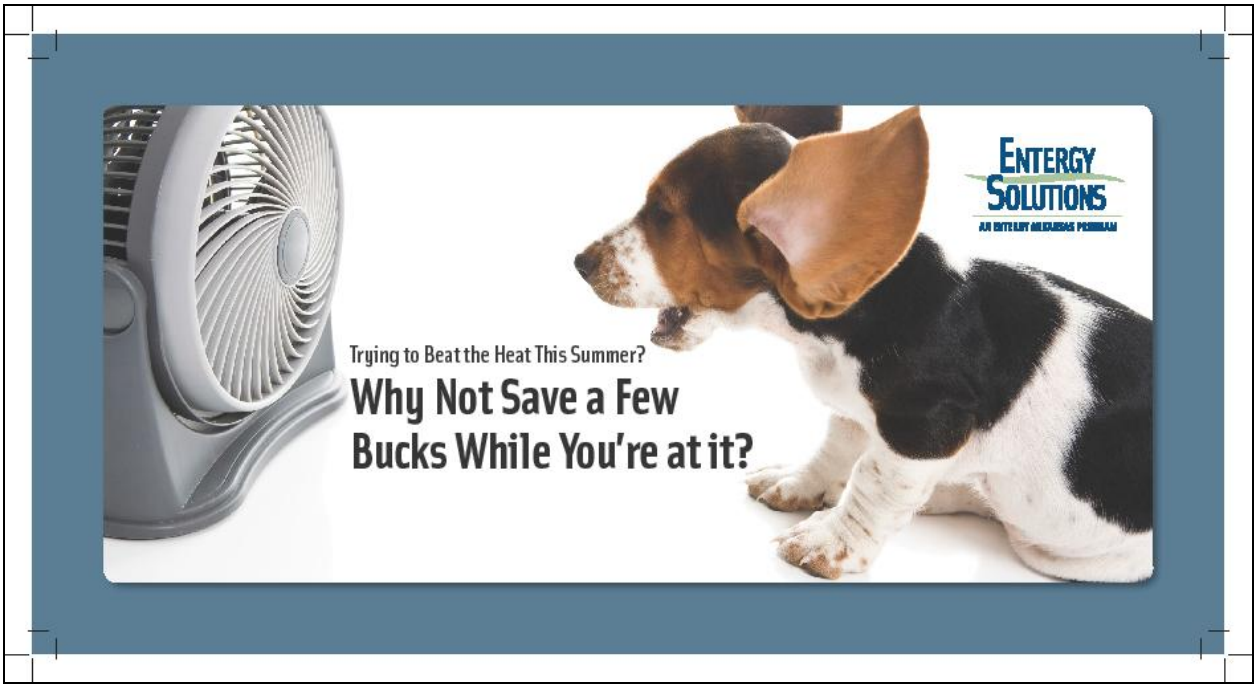
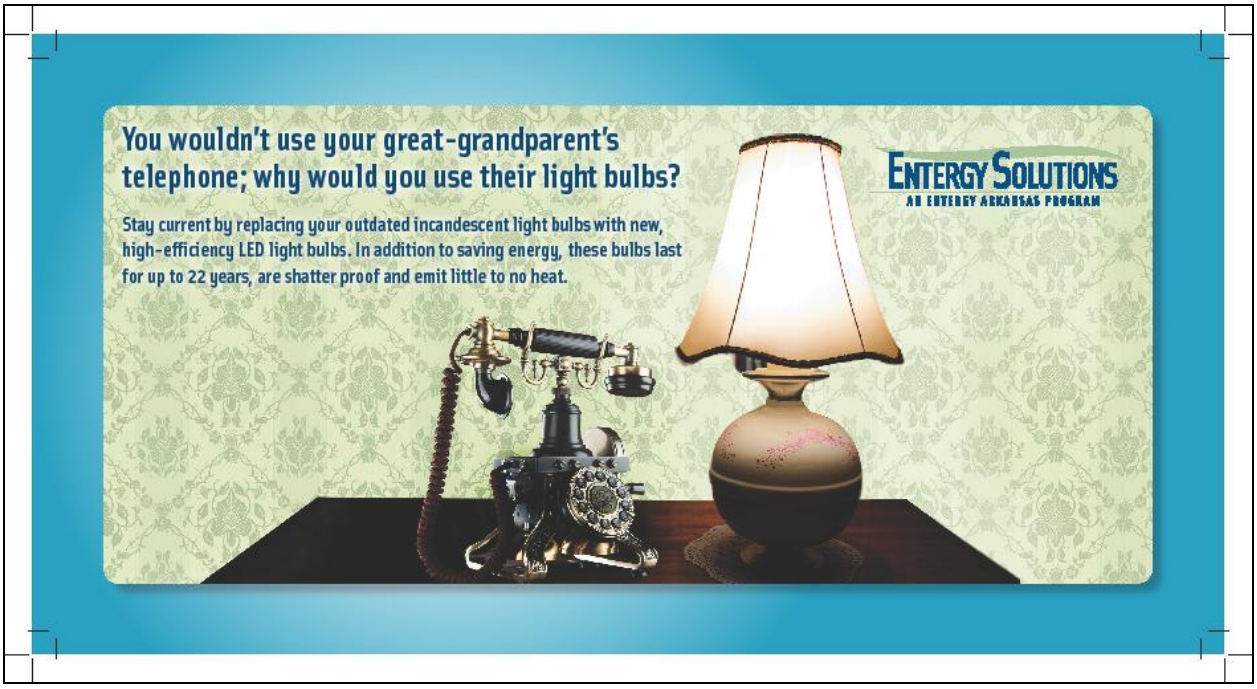
L&A A/C Mailer



L&A A/C Mailer, Reverse

L&A LED Mailer



L&A LED Mailer, Reverse

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2.8 Agricultural Irrigation Load Control

AILC Program Manual

ENTERGY ARKANSAS INCORPORATED

2013 Agricultural Irrigation Load Control

Program Manual

11/18/2013

This manual is a living document used to manage the program and program process for this demand response program. Earlier program year manuals and approved APSC filings have served as a basis for this document.

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PART I - Program Overview

Program Description

The Agricultural Irrigation Load Control (AILC) Program is part of a comprehensive portfolio of energy efficiency programs offered by Entergy Arkansas Inc. (EAI). The AILC program pays participants incentives in return for allowing EAI to interrupt their pumping loads (also referred to as curtailment event or scheduled event) during summer peak loads. These incentives are paid in the form of billing credits. The load control season runs from June 1st through August 30th. The AILC program provides other benefits for the participants such as real time text or e-mail notifications of curtailment events and allows participants to remotely control (i.e., turn on and off) the wells that are on this program[1].

The Program is designed to minimize the following market barriers to demand response implementation for EAI's agricultural water pumping customers:

- Lack of program awareness; the AILC program will market the benefits of the AILC program through marketing which will feature incentives and other benefits.
- Technical impediments; the AILC program will work aggressively to minimize the lack of equipment, software, and two way communication systems required by the program for both participants and EAI operations.
- Burdensome capital costs; the AILC program will fund the equipment and installation capital costs thereby minimizing the capital outlay for participants.
- Uninformed cultural energy environment; the AILC program will transform long-term and permanent changes in attitudes, awareness, and knowledge about energy savings and use of energy efficient technologies in order to achieve energy savings. Marketing and billing credits are the two primary methods in which this program will achieve these long-term changes. General awareness campaigns and program-specific marketing will raise awareness and understanding of the demand reducing opportunities for participant's energy consumption.

Program Objectives

The AILC program objective is to defer the need for new peaking generation investments by reducing utility on-peak demand. The AILC program will reduce demand by shifting on-peak energy to off-peak times. Based upon the type of usage that is being interrupted, it is expected the energy not used during interruption times will be made up during non-interruption off peak times. The AILC program was designed to be cost-effective and reduce peak demand by an estimated 45 MW by 2014. EAI' original PSC approved and filed plan projected 2,200 irrigation accounts by 2013. This original EAI's plan was to recruit 500 accounts in 2010, 600 accounts in 2011, 700 in 2012 and 400 accounts in 2013. The total target level would represent approximately a 20 percent penetration rate of the eligible target market. The estimated planned cumulative demand reduction[2] is 10,000 kW for 2010, 22,000 kW for 2011, and 36,000 kW for 2012 and 44,000 kW for 2013. Since the actual enrollments through program year 2012 were short by 550 accounts, the 2013 participant goal was revised upwards from 400 new participating wells to 700 new wells.

Program Administration

EAI will implement the AILC program through the use of EAI Management, EAI Staff and EAI resources. Additionally EAI will utilize third party vendors for information technology support, equipment design and manufacturing, and for the installation and maintenance of AILC equipment. Additional third party vendors will be engaged as required for marketing, monitoring and tracking the program performance goals. See appendix for participant process flow chart.

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[1] The ability for a participant to remotely turn his registered well on or off is superseded by curtailment events. 2013 is the first year this new feature is available to all participants.

[2] Values are gross demand reduction values.

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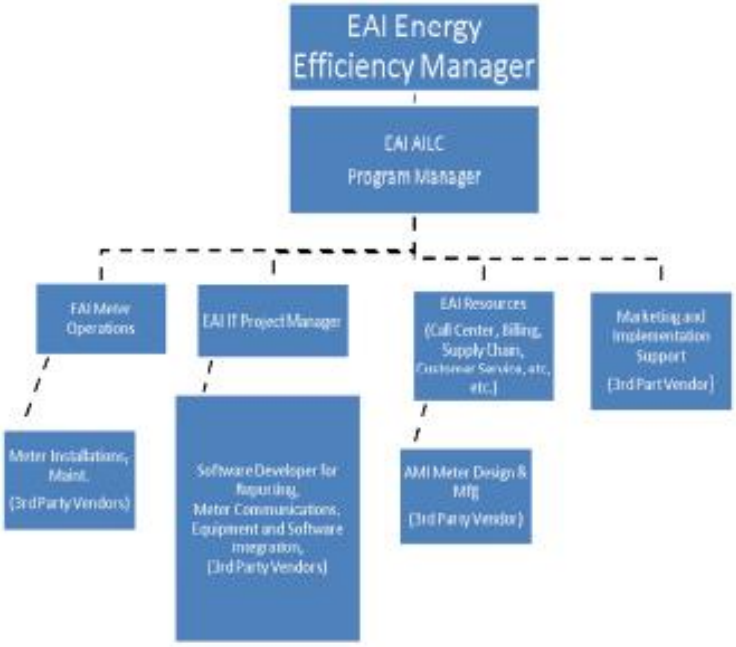
Program Changes

The 2013 AILC program resource plan does not have any program modifications from 2012. The implementation of the plan 2013 AILC program includes one half of an EAI full time employee to function as the in-house program manager.

AILC 2013 ORGANIZATIONAL CHART



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AILC 2013 CONTACT INFORMATION TABLE

Name	Role	Company	Telephone	E-mail
Accenture	IT Software Developer for EAI customer Software	Accenture	Contact Erin Mayo	Contact Erin Mayo
Baw, Dan	Marketing and Support	Advanced Information Services	501-258-2584	danbaw@swbell.net
Canterbury, Robert	Procurement Specialist	EAI	501- 944-8156	rcanter@entergy.com
Gervenak, David	Director Smart Grid	Elster Solutions	919-621-9707	David.Gervenak@us.elster.com
Gordon, Kuba	Business Service Operation Support	EAI	501-377-3681	Kgordo2@entergy.com
Graves, Jonathan	General Foreman	SEC	Call Scott Conrad	Call Scott Conrad
Green, James	Manager Meter Reading Operations	EAI	501-377-4336	Jgreen@entergy.com
Parker, Grace	Engineer	EAI	501-223-6109	lparke3@entergy.com
Jeter, Denice	Energy Efficiency Budget Coordinator	EAI	501-377-3686	Djete90@entergy.com
Klinge, Kevin	Project Manager	Elster Solutions	919-250-5840	Kevin.klinge@us.elster.com
Mayo, Erin	IT-Project Manager	EAI	601-985-2314	evalent@entergy.com
Minter, Doris	Customer Service Representative	EAI	870-672-4901	dminter@entergy.com
Munoz, Gabe	Program Manager	EAI	501-377-36959	gmunoz@entergy.com
Scott, Conrad	Supervisor Construction	EAI	501-279-3103	cscott@entergy.com
ATKINS	Installation Vendor	ATKINS	Call Scott Conrad	Call Scott Conrad
Smith, Richard	Energy Efficiency Manager	EAI	501-377-3638	Rsmith18@entergy.com
Standridge, Bobbie	Sr. Customer Service Specialist	EAI	501-301-3502	bstandr@entergy.com
Waguespack, Gerald	IT Project Manager	SAIC	8-574-7219	GWAGUES@entergy.com

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Program Eligibility

The eligibility requirements for the AILC program are:

- Participants must have an active account in good standing with EAI
- Participants must be taking service under EAI's Agriculture Water Pumping Service Schedule
- Participants must have authorization to modify existing metering configuration
- Participants must equipment which is accessible and capable of accommodating program equipment[3]

Program Incentives

The AILC program pays participants through billing credits. The credits are based on $4.16 per kW of their billed demand up to 30% of the total base [4]bill and are applied to the billing cycles which cover service from June 1 through August 30. The participant experience will vary widely and is dependent on variables such as motor size and efficiency, weather, crop, irrigation type, water table and soil conditions. The typical efficiency of most well motors is somewhere between 70-75%. The typical participant in 2012 averaged a 29 kW demand per participant billed account. The average incented billing credit per meter in 2012 was $85.31[5]. The experience from previous years in the load control pilot program shows a participant can typically expect to curtail a load of approximately 20 kW. See appendix for participation process flow chart.

Typical AILC Credit & Installation Costs

Size of Motor in HP	Typical kW Demand (.75 Motor Efficiency)	Typical Monthly Credit	Typical Customer Contribution for Installation of 1/10 Mile	Typical Customer Contribution for Installation of ¼ Mile
10	10	$41	$167	$3,917
15	15	$62	Typically No Installation Cost	$2,750
20	20	$83	Typically No Installation Cost	$1,583
25	25	$103	Typically No Installation Cost	$417
50	50	$207	Typically No Installation Cost	Typically No Installation Cost
75	75	$310	Typically No Installation Cost	Typically No Installation Cost

[3] In program year 2013 the program notified un-installable well accounts that starting in 2014, EAI will end the longstanding practice of paying AILC credits for well locations which have registered the wells but have not been able to get equipment installed.
[4] The base bill is the bill before line item riders outside of the Agricultural water pumping rate tariff.
[5] Based on available 2012 Billing Credit information. In 2012, 1263 meters received a total credit of $323,221

10/29/2013

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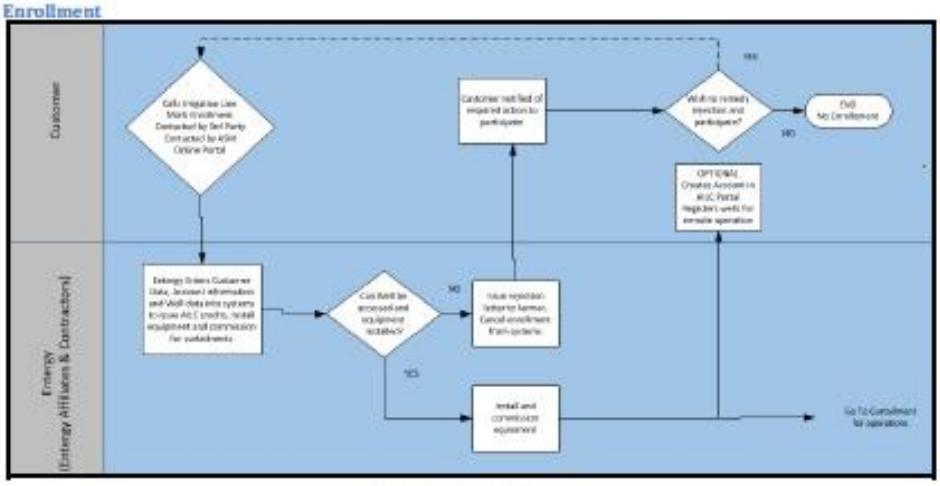
PART II - Customer Experience

Enrollment



Customer Participation Process

The participant must be the owner of the pumping unit(s), or the participant will furnish EAI the owner's written consent for the installation of the control device. If the participant response is greater than anticipated, EAI will suspend the marketing and outreach efforts. Once the budget for the current year is expended, a waiting list will be established for program participation in the following program year. Typically the participant may enroll in one of three ways[6].

- Participant may complete the pre-printed irrigation account forms sent in recruitment mailings and either mail back or fax back to the EAI irrigation desk.
- Participant may choose to call the EAI irrigation desk at 1-800-324-4709 and relay information to customer service representative.
- Participant may choose to enroll online at www.entergyarkansas.com/loadcontrol. Online enrolment requires participant to have account and well information in order to complete the process.

If there is evidence of alteration of or tampering with EAI's control device, the participant will reimburse EAI for the cost of a replacement or repair of the control device and the credit to customer's bill during the applicable season as it is defined in the EAI's Agricultural Water Pumping Service Rate Schedule. Furthermore if tampering is experienced, EAI may cancel service under this schedule and remove its control device. If EAI elects to cancel service under this schedule and remove its control device as a result of tampering, the participant will pay EAI associated removal costs. Participation in this program shall be for the peak billing seasons (June 1 to August 30) of the current year and shall be automatically renewed for successive peak billing seasons in succeeding years unless terminated by participant. The participant agrees

[6] Individual recruitment by assigned account managers and larger agricultural farmers with more than 20 wells may follow independently customized enrollment methods.

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to allow EAI representatives to have access to the pumping unit for the purpose of installing, testing, and maintaining the remote control device at all times. Any maintenance or outage issues experienced by a participant should follow the standard service requesting process by calling 1-800-324-4709.

Curtailment Events

EAI will conduct a test curtailment at the beginning of the season to test the communications and operations of installed equipment. Other test curtailments may occur as required. The AILC program will only curtail the participating irrigation loads during the peak billing season. In addition, the curtailments may only be scheduled on weekdays for a total of three hours and be limited to occur between 12:00 noon and 9:00 PM. Before a curtailment event the participant will receive an e-mail or text message notifying them of an upcoming curtailment including the duration of the curtailment as long as curtailment notification is selected during the enrollment process. If the participants register their wells for remote operation, they may schedule their own individual curtailment and disconnect or reconnect the enrolled well account load utilizing the AILC website (http://entergy-arkansas.com/loadcontrol).Remote operations of the wells will not be accessible during any AILC curtailment.

Program Termination

If participants find they cannot continue or do not wish to continue participation in the program provisions are made for participants to "opt out" or discontinue participation by refunding any billing credits paid for the current program year. Unless equipment removal is requested, opting out of the program will initiate field services to place the load control box on "by-pass" mode. This will allow the opt-out customer to experience uninterrupted service and allow future participation without additional service calls for equipment installation.

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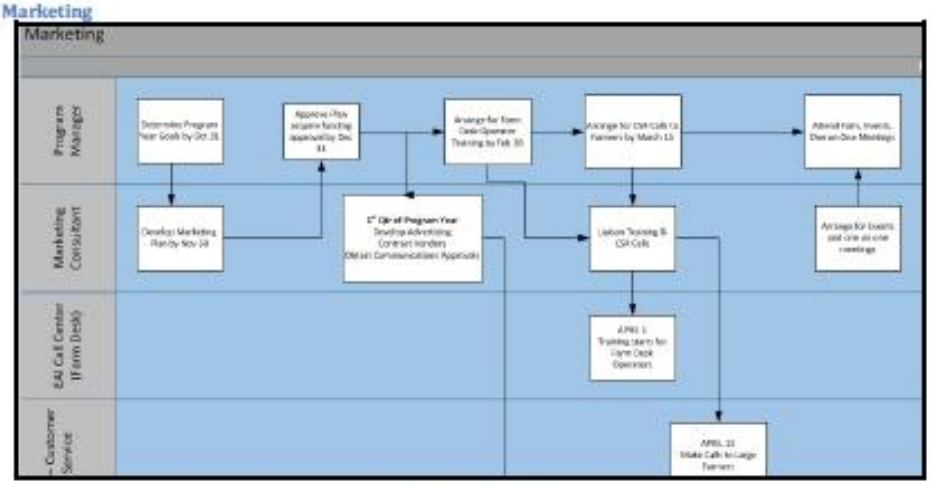
PART III - Operations

Marketing



Marketing Process

One of the 2012 lessons learned was the marketing for the farming community needed to take place BEFORE farmers start planting for the new season. In 2012, the planting season started early in the year and was completed by April. In 2013 EAI will begin participant recruitment in the 1st quarter of the year before planting season starts. EAI will use vendor supported marketing efforts, leverage existing in-house telephone centers, direct mail, and one-on-one sales to achieve the participation goals for the program year. Additional focused mass marketing will be implemented utilizing radio, print ads and online marketing. One of the 2013 marketing plan's goals is to increase enrollment by educating the market on the ability for participants to use the program equipment to remotely operate their wells. This new feature has garnered a tremendous amount of interest in one on one participant dialogue.

During the year one-on-one meetings with farmers and agricultural events will be attended to promote the program. To help promote the program a demonstration unit comprised of a functioning full size meter and control box will be built. This will allow potential participants the ability to experience firsthand the ease of remote well operations.

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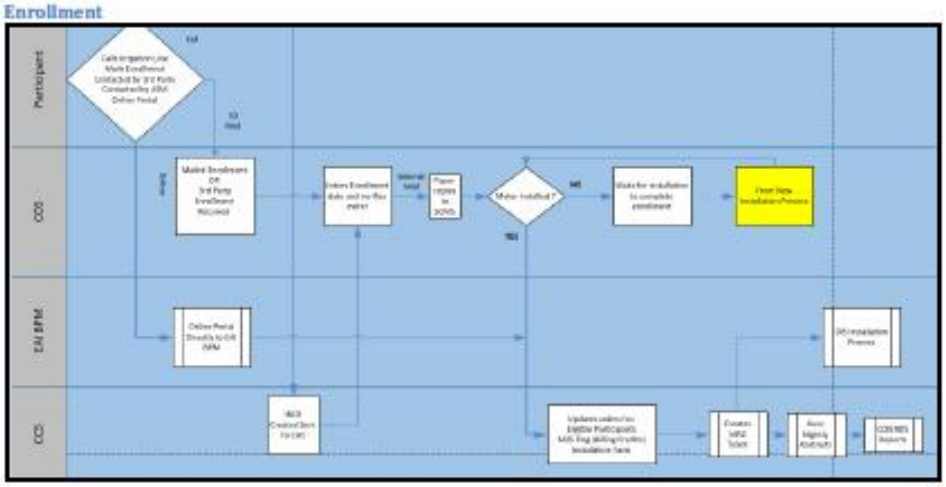
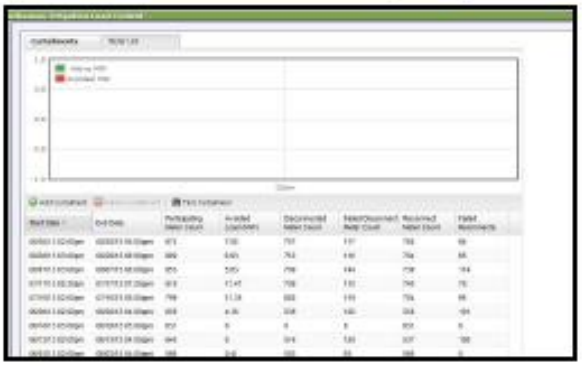
Enrollment



Operations Enrollment Process

The customer enrollment request which begins the Operataions Enrollment Process can come from either telephone, U.S. Mail, outside third party, EAI Account Service Managers or directly from the AILC Website. When initiated by U.S. Mail a Customer Operations Support Associate will enter enrollment data directly into the Internal Curtailment Portal.



Internal Portal Curtailment Tab

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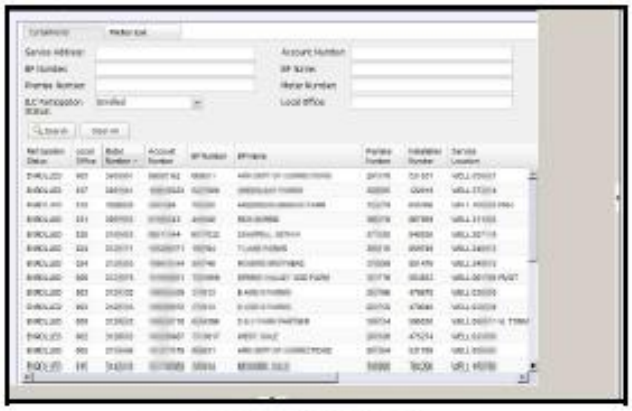
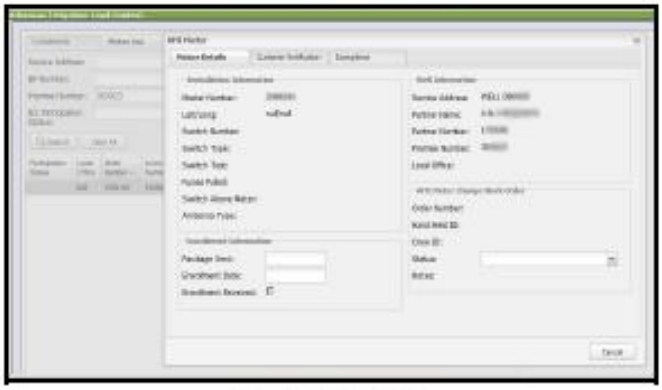


Internal Portal Meter Database Tab



Internal Portal Data Entry Tab

This secure website allows authorized users to access appropriate levels of data entry, enrolled meter data including customer account information, current available load, curtailment data and the ability to schedule program curtailments. Once data is entered, the process is to send paper initiated requests to Secure Contract Management Systems (SCMS) and verify the requsted enrollment has an installed meter. If the request is for a new well location and does not have an installed meter, the request is re-routed to EAI servcie personell for meter installation. If a meter exists then the request initiates an "MRZ" work order in EAI's proprietary customer account software (CCS). The CCS work orders are downloaded into EAI's servcie work management system (DIS). The DIS work orders are assigned to the appropriate work group and all

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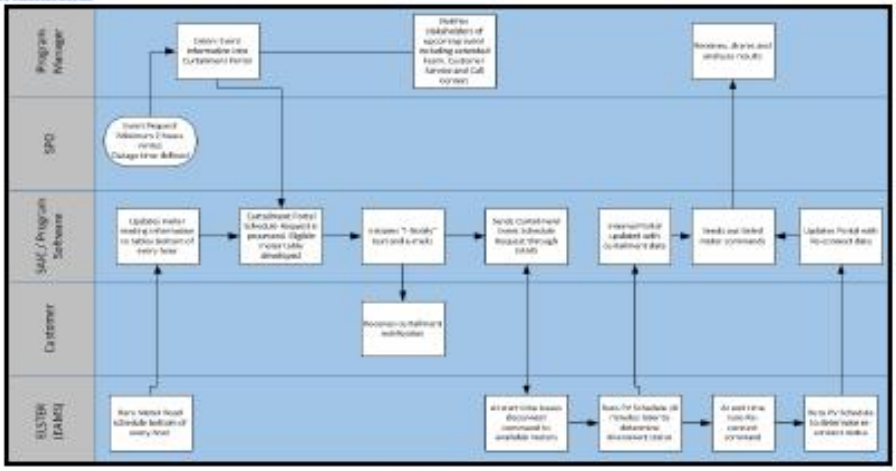
MRZ tickests are assigned to the AILC installation crews. Once the ticket is completed the customer information and well data are added and avaiable for curtailment.

External Customer Website

The customer is now enrolled and equipment is operational. At the customer's option, the account can now be registed on the External Customer Website and operated remotely once the well is activated by the farmer.

Curtailments



Curtailment Process

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Program curtailments can be initiated three different ways. First a curtailment may be called by Entergy's System Planning and Operations group (SPO). This is the primary function of the program. As a secondary benefit in an emergency situation the program may be used to alleviate grid overloading. The emergency curtailment request may come from the SPO or regional operations centers. The last curtailment initiation method is initiated by the program manager for program testing. EAI will conduct a test curtailment at the beginning of the season to test the communications and operations of installed equipment. Test curtailments will usually be limited to a two-hour event. Other test curtailments may occur as required. The AILC program will only curtail the participating irrigation loads during the peak billing season. In addition, the curtailments may only be scheduled on weekdays for a total of three hours and be limited to occur between 12:00 noon and 9:00 PM. Before a curtailment event the participant will receive an e-mail or text message notifying them of an upcoming curtailment including the duration of the curtailment as long as curtailment notification is selected during the enrollment process.

In 2014 the AILC Program will attempt to qualify as a MISO demand response resource which requires the curtailment to last for four hours. In 2014 the AILC program will attempt to call for cascading curtailments to obtain a four hour curtailment. For example if 1200 wells are available at an average of 20 kW per well the resulting 24 MW will be divided and cascaded to achieve a four hour curtailment of 12 MW. See image below.

Ramp up	MISO 4 Hour Curtailment 12 MW				Ramp Down
1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
curtailment of	600	wells			
1:30 - 4:30	20	kW / well			
			curtailment of	600	wells
			3:30 - 6:30	20	kW / well

The curtailment event is initiated by the program manager utilizing the Internal Curtailment Portal. The secure portal limits access of the scheduling feature to a pre-determined list of users. To schedule a curtailment an authorized user can simply click on the curtailment link and schedule a curtailment event by entering the starting and ending date and time sand ensuring the curtailment alots sufficent time to complete pre-curtailment validations prior to the start of the cusrtailment. The pre-curtailment process is alloted 2 hours for completion. The program manager will then send a notification of curtailment to interested stakeholders.

Scheduling a Curtailment

In order for the entire curtailment process to function all meters enolled in the program must be able to be "disconnectable". If a meter is not disconnectable the scheduled curtailment will fail. The pre-curtailment process

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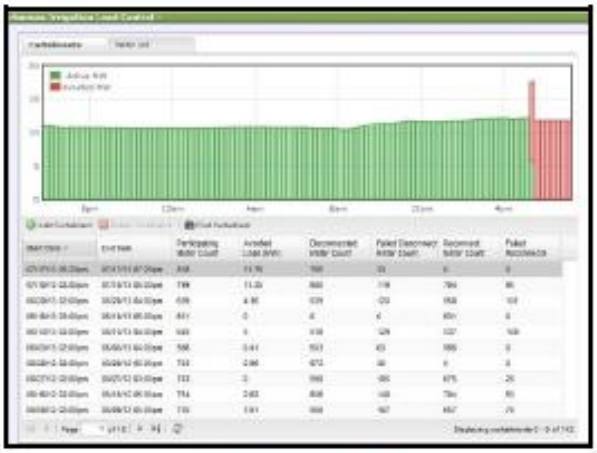
validates the connectability against a data table in the AILC Program Database (MDUS) which is downloaded from Elster's Energy Axis Management System (EAMS) to verify connectivity status. After validation, a list of scheduled meters is automatically sent to EAMS for curtailment schedule placement and a software program called "I-Notify". The I-Notify software sends a text or e-mail to the meter owners and other stakeholders informing them of the upcoming scheduled curtailment. At the scheduled time the External Customer Portal will be have the remote control feature disabled. EAMS will then activate the curtailment at the scheduled time for the validated meters and schedule a present value (PV) meter reaing 20 minutes after the start of curtailment. The PV results are uploaded to MDUS and a table of failed disconnected meters is produced and sent to I-Notify which disiminates the e-mails to program stakeholders. The PV is also updated to the Interbal Curtailment Portal which displays disconnected meters and associated loads as well as the number of failed meters. Meters may fail to disconnect for several reasons such as:

- Failed cellular servcie
- Equipment Failure (lightning strike – Other Malfunction)
- Meter has been turned off by customer or power failure



Curtailment Portal Active View

At the scheduled end time for curtailment EAMS will send a re-connect signal to all validated meters. 20 minutes after the re-connect signal is sent a PV reading is scheduled in EAMS and uploaded to MDUS. The failed reconnected meter list is sent to stakeholders through I-Notify and all tables and portals are updated with current meter status and associated loads. After curtailment the External Customer Portal will enable remote control by participants.

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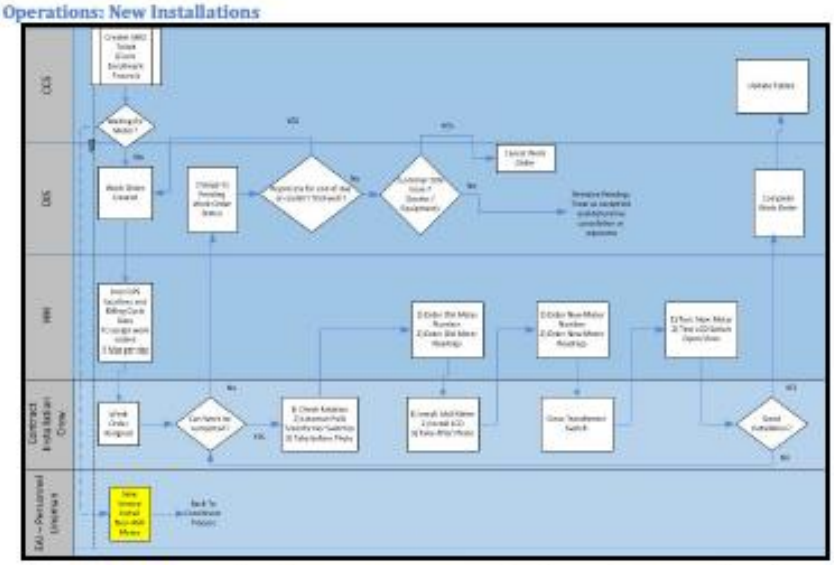
Field Operations: New Installations



All new program equipment installations will be overseen by the Operations Field Engineer. The Engineer will coordinate third party installation resources with EAI's supply chain. After contractor selection, resources will be trained on EAI's safety protocols, and latest equiment specifictaions and installation techniques. The resources will also be equiped with hand-held units capable of downloading DIS work orders. To succesfully commission new equipment in the field the work orders must be completed during a non-meter reading cycle and an existing EAI meter should be installed.

The installation procedure is to assess if the location and participant's existing equipment is suitable for installation. If the participant's equipment cannot be accessed or cannot accommodate the program equipment the work order will be rejected. Rejected work orders will be forwarded to Field Engineer and Program manager. The engineer will cancel the work order and the program manager will send a rejection letter to the participant de-enrolling them from the program until the situation is remedied.

For installations without restrictions, after notifying the participant of their arrival (when reasonable), the installation crew members will first check the line rotation ensuring the phases are as expected. The lineman will then open the transformer switch de-energizing the existing meter and meter load. The new equipment will be installed with meter information recorded and photos being taken before and after installation. The lineman will reclose the transformer switch and the meter and disconnect box is tested. Successful installations upload a completed work order while failed installations loop back to the appropriate step.

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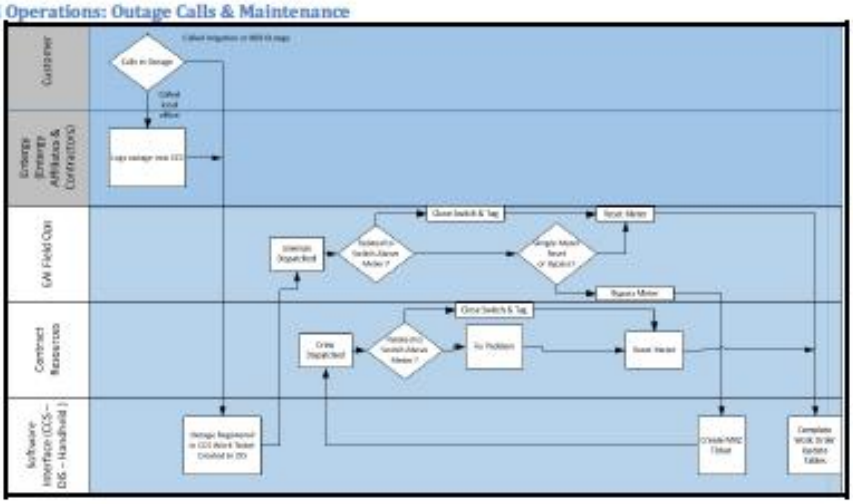
Field Operations: Outage Calls & Maintenance



EAI personnel handle emergency service calls 24 hours a day 7 days a week but do not work on program equipment. Standard operating procedure is to get the service back on by bypassing program equipment or replacing AMI meters with non-AMI meters. All repairs and program installation are completed by contract crews which are generally available Monday – Thursday April 15 through August 15. Work assigned to contract crews is distinguished in the work management system with a distinction of an "MRZ Work Ticket". All equipment outages start with notification from the participant. The participant will either call the irrigation desk or the 1-800-OUTAGE number if calling after business hours. Some participants have a special relationship with the local field office personnel and will call the local office personnel directly. When the local office personnel are involved they input the outage information into CCS in the same way the outage desks do. CCS will create a service call ticket and a lineman will be dispatched to the site. Upon arrival the lineman will determine if the participant has disabled the meter by operating the disconnect switch above the meter. If this is the case then the switch should be closed and if possible the meter should be re-set. Upon resetting the meter a "Do Not Operate" switch tag should be place on the disconnect switch and the ticket can be closed. If it is undetermined that the meter cannot be reset then the meter should be replaced with a non-program meter and the program equipment should be bypassed. An MRZ ticket should be created. If upon arrival the program equipment has been damaged then the program equipment and meter should be replaced or bypassed in order to get service back on. An MRZ ticket should be created so a contract crew can repair the equipment.

Contract crews handling maintenance calls will download the MRZ tickets into their handheld units and repair as the Field Engineer assigns the repairs. Once assigned the crew will determine if a disconnect switch above the meter was a factor in the outage. If so, then a "Do Not Operate" switch tag will be placed on the disconnect switch and repairs will be completed. After repairs are completed the work order ticket is competed in the system and all tables are updated.

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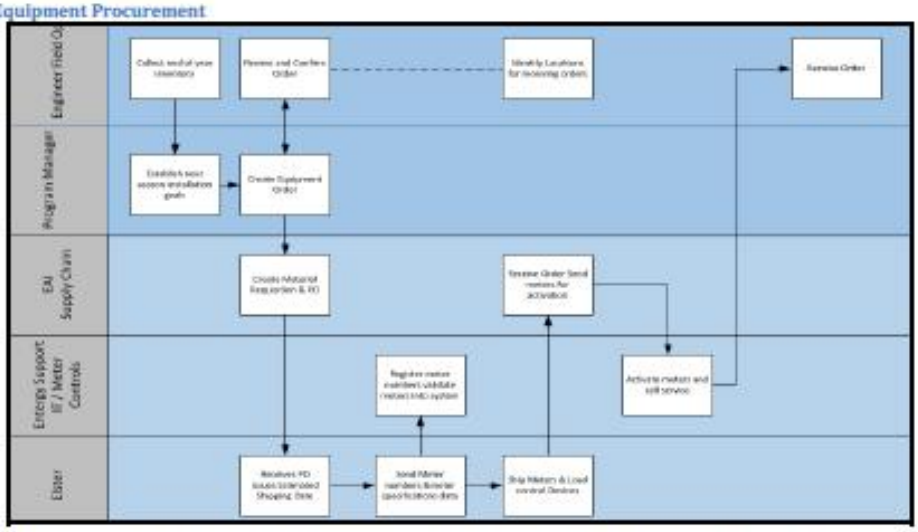
Equipment Procurement



AILC equipment ordering is handled through Entergy Service' Supply Chain department. Currently the only available supplier for program equipment is Elster Manufacturing. The program employs Automated Metering Infrastructure (AMI) meters with cellular technology and a load control device (LCD). There are four meter form types the program keeps inventoried along with four differently rated LCDs. In addition to the meters and LCDs the program stocks a regular and high gain antenna. These inventoried items are available by special request from Entergy Services Supply Chain. Supply Chain has coordinated specifications for all inventoried items and has created catalogue ID numbers for these parts.

Entergy Cat ID #	Equipment	Type
0032101261	Load Control Switch	240V, 120A
0032101397	Load Control Switch	240V, 200A
0032101322	Load Control Switch	480V, 120A
0032101320	Load Control Switch	480V, 200A
0032101252	Electric Meter	2S
0032101254	Electric Meter	9S
0032101256	Electric Meter	12S
0032101258	Electric Meter	16S
0032101253	Electric Meter	35S
0032078126	Antenna	High Gain
0032078114	Antenna	Salt Shaker

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Standard operating procedure for material ordering through supply chain dictates all external orders are processed with a material requisition and purchase order.

At the end of the curtailment and installation season the field engineer will take a detailed review of all inventories and inventory locations. Usable inventories will be tallied and communicated to the program manager. The program manager will confer with the field engineer and create a purchase request. The request will be forwarded to supply chain no later than January 31 of the program year. Supply Chain will coordinate the purchase and delivery with the manufacturer. During manufacturing when meter numbers are assigned, the data will be communicated from the manufacturer to Entergy Services Meter Support group for processing. The meter numbers need to be integrated into Entergy's metering control systems for future activation. The completed order is shipped back through Supply Chain where meter and cellular activation occurs. After activation the equipment is shipped back to the field engineer's preferred inventory locations.

Quality Management System

EAI management will utilize a three tiered system for quality assurance and verification.

- Tier 1 will ensure participant enrollment, installation and operation of AILC equipment and appropriate billing credit application. Please reference process flow charts for further details. Tier 1 tools and resources are built into EAI's automated processes and software developed for operations work orders, customer data systems and program reporting. Tier 1 tools and resources monitor the quality and functionality of participating accounts. These Tier 1 tools and resources include but are not limited to:
    - EAI's proprietary customer service software CCS
    - EAI Operation's work scheduling system
    - EAI's outage reporting system
    - AILC Web portal Dashboard
    - AILC's Handheld Installation Units
    - EAI's EAMS reporting
- Tier 2 quality assurance and verification includes review and oversight from EAI management and staff. EAI personnel will review installation invoicing and verify installation work by reviewing meter operations and conducting field site visits. EAI staff resources will personally attend to participant issues either by telephone, in person or through correspondence. EAI management will query available database information to measure activity success and failure rates for proposed curtailments, remote well operations, incentive distribution and budgetary execution. EAI management will also monitor and create monthly internal reporting on load and participant goal attainment. EAI will also employ a 3rd party vendor to conduct participant and ex-participant surveys to gage program satisfaction and marketing effectiveness.
- Tier 3 will be implemented by an independent measurement and evaluation contractor. The independent contractor will review procedures, implementation, goal attainment and participant satisfaction.

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APPENDIX

AILC Responsibility Matrix – Page 1

Task	EAI EE Portfolio Manager	EAI Program Manager	EAI - IT Project Manager	EAI - IT Portfolio Manager	EAI Operations Field Engineer	EAI Operations Resource Support	Marketing Consultant	IT Contractor PM
A – Accountable for task I – Get informed of event or status R – Responsible for Integrated Functions	Richard Smith	Duke Munoz	Erin Mayo	Mike Adams	Grace Parker	Scott Conrad	Dan Rice	SAIC - Gerald Wagenpeck
Curtailment Event	I	A Schedule event in curtailment Portal	R Provide direction for IT resources to enable curtailment control, data updates and notifications	I	I	I	I	R Provide direction for SAIC resources to enable curtailment portal, data updates and notifications
Participant Enrollment or Opt Out		A Develop and support processes and automation to register participation status	R Provide direction for IT resources to enable data updates		R Provide direction for installation resources to enable equipment installations	R Provide support to acquire and supervise installation resources	R Provide administrative support to Program Manager	R Provide oversight of SAIC resources to enable table updates, billing credit and installation work ticket notifications
Equipment Ordering	R Provide Support to Program Manager with new/modified Mfg contracts	A Develop Next Season equipment order. Develop funding requirements. Develop Contract for Mfg support for equipment.			R Provide inventory status, installation statistics and support for next season equipment and Mfg support needs		R Provide support for next season potential recruitments	

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AILC Responsibility Matrix– Page 2

Task	Equipment Manufacturer PM	Recruitment/Admin & AMR	Customer Tracking Specialist	Customer Tracking Analyst	Customer Tracking Asst Services Manager	Center Specialist	Customer Service Center CSR	Telephone Center Supervisor
A – Accountable for task I – Get informed of event or status R – Responsible for Integrated Functions	ELECTRIC- Kevin Kilage	Charles Magee, Mike Davis, Doris Milner, Teadon White, Russell Everett	Bill Green	Kulia Gordon	Paula Martinez	Bobbie Wooldridge	Brandi Jackson	Sheila Taylor , Danny Mason
Curtailment Event	R Provide schedule protocols in EAMS	I	I	I	I	I	I	R Inform phone center and irrigation desk of event
Participant Enrollment or Opt Out			R Set meters on AMR auto read/Monitor Monthly Auto Read/Verify data in On-going Status Calls/Meet regular meter/check on manual read	R Coordinate any changes to the installation and communicate with MEAS				R Shared Responsibility with Tracking Specialist - Participant data into Curtailment Portal Data Tab
Equipment Ordering	R Provide equipment order and services estimate to Program Manager. Support contracting of new services		R Provide meter integration support for assessment orders. work with IT to change the MR control on the installation in CCS to auto read. For existing AMR meters, change the MR control					

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AILC Responsibility Matrix – Page 3

Task	Center CSR - Training Specialist	Customer Accounting Services - Specialist	CCS Engineer	NMC Engineer	NMC Handheld Unit Engineer	System Planning Org	Distribution Ops Center	Distribution Field Service
A - Accountable for task I - Get informed of event or status R - Responsible for Integrated Functions	Evelyn Brown	Marsha Jordan / Sherry Hale	Derek Ratner	Don Purling	Alex Gomez	Mike Hall	Ryan Projoed	Line Supervisors / Sec Mgrs
Curtailment Event	I	I		R Provide updated billing meter availability list and pre-curtailment process data to Cluster. Compile list of available WiC meters		R Send the curtailment request if originating from SPO	R Send the curtailment request if originating from Distribution Ops	I
Participant Enrollment or Opt Out	R Shared Responsibility with Telephone Center Supervisor. Participant data into Curtailment Portal Data Tab	R Update Participant billing credit status	R Support CCS interface data	R Provide for automated table updates in MDUS for enrollment status and installation facts	R Provide support to Field Operations Hand held units			R For participants enrolled locations with new sell-in, install regular non-AMR meter to enable opt out/in function
Equipment Ordering				R Provide integration support for equipment orders, coordinate newly acquired meters to ensure meters are provisioned with Verizon Verify newly acquired WiC meters are entered into T_METER_ table in MDUS Verify acquired DAMG operated meters are inserted into MDUS activate installed ILC meters prior to the ILC season start date. De-activate installed ILC meters at the end of the ILC season				

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AILC Responsibility Matrix – Page 4

Task	EAI EE Portfolio Manager	EAI Program Manager	EAI - IT Project Manager	EAI - IT Portfolio Manager	EAI Operations Field Engineer	EAI Operations Resource Support	Marketing Consultant	IT Contractor PM
A - Accountable for task I - Get informed of event or status R - Responsible for Integrated Functions	Richard Smith	Gabe Munoz	Erik Mayo	Mike Adams	Grace Parker	Scott Conrad	Dan Baw	NMC - Gerald Wagenpadt
Software Upgrades	R Provide list of desired enhancements to Program Manager. Support Program Manager with new/modified IT contracts	A/R Assemble team software requests into Final list of desired enhancements to IT Project Manager. After SOW is finalized create or modify contracts to support SOW and Milestoned	A/R Develop Next Season software upgrades SOW. Facilitate IT Requirements Gathering Sessions. Finalize project requirements with business stakeholders. Ensure that IT Requirements are Delivered on time and on budget. Coordinate, Oversee, and Participate in Customer Acceptance Testing	R Provide direction and support to acquire contract and resources for upgrades	R Provide list of desired enhancements to Program Manager			R Provide NOW and cost estimate to IT Project Manager
Funding	R Provide Support to Program Manager with new/modified RP	A Create or Modify RP and work orders to accommodate new equipment, mfg services and IT upgrades contracts.						

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AILC Responsibility Matrix – Page 5

Task	Customer Invoicing Specialist	Customer Invoicing Analyst	Customer Invoicing Asst Services Manager	Customer Service Center Specialist	Customer Service Center CSR	Customer Service Center Telephone Center Supervisor	Customer Service Center CSR - Training Specialist	Customer Accounting Services Specialist
A = Accountable for task I = Get informed of event or status R = Responsible for Integrated Functions	Jim Green	Ruba Gordon	Paula Mcelroy	Bobbie Standridge	Brandi Jackson	Nanita Taylor , Danny Moore	Evelyn Brown	Marsha Jordan / Sherry Hale
Software Upgrades	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager	R Provide list of desired enhancements to Program Manager
Funding								

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AILC Responsibility Matrix- Page 6

Task	Customer Accounting Services Specialist	CCS Engineer	SAIC Engineer	SAIC Handheld User Engineer	SAIC Developer	CCS Sr Analyst	Regulatory Accounting	System Planning Org
A = Accountable for task I = Get informed of event or status R = Responsible for Integrated Functions	Marsha Jordan / Sherry Hale	Derek Rateau	Dan Purling	Alba Gomez	Stephen Grillo	Art Cortizino	Jim Berkins - Mgr	Mike Hall
Software Upgrades	R Provide list of desired enhancements to Program Manager	R Provide support to produce SOW and cost estimate to IT Project Manager	R Provide support to produce SOW and cost estimate to IT Project Manager Provide direction and support for developers working on ILC related enhancements modifications. Including detail clarification and testing support. Work with the ILC business team to identify and correct issues. Work with the vendor (Qlater) as needed to resolve issues and coordinate modifications as required.	R Provide support to produce SOW and cost estimate to IT Project Manager	R Provide support to produce SOW and cost estimate to IT Project Manager	R Provide list of desired enhancements to IT Project Manager		
Funding								

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AILC Responsibility Matrix – Page 7

Task	EAI IT Portfolio Manager	EAI Program Manager	EAI IT Project Manager	EAI IT Portfolio Manager	EAI Operations Field Engineer	EAI Operations Resource Support	Marketing Consultant	IT Connector PM
A = Accountable for task I = Get informed of event or status R = Responsible for Integrated Functions	Richard Smith	Gabe Munoz	Erin Maye	Mike Adams	Grace Parker	Scott Conrad	Don Daw	SAIC - Gerald Wagenpack
Marketing	I	A/R Create or assist in creation and approval of upcoming year's marketing plan					A/R Provide marketing data from previous seasons and recommend strategy and plan for upcoming season. Plan to include use of EAI customer facing personnel and appropriate training.	
Maintenance & Operations of Equipment & Service		R Provide support to field ops	R Provide support to Field ops Escalate any IT Related issues		A Complete or reject for cause all maint work orders from CCs/CRS. Complete root cause analysis on replacements. Track warr issues	R Provide support to Field ops Installation crews		

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AILC Responsibility Matrix – Page 8

Task	Equipment Manufacturer PM	Customer Service Representatives & ASM	Customer Invoicing Specialist	Customer Invoicing Analyst	Customer Invoicing Acct Services Manager	Customer Service Center Specialist	Customer Service Center CSR	Customer Service Center Telephone Center Supervisor
A = Accountable for task I = Get informed of event or status R = Responsible for Integrated Functions	ELSTER - Kevin Klingo	Charles Mogro, Mike Davis, Doris Minter, Teadeo White, Russell Everett	Jim Green	Kuba Gordon	Paula Mosiroy	Bobbie Standridge	Brandi Jackson	Vanita Taylor , Stacey Mason
Marketing		R Provide support during account activation season by calling larger agricultural accounts, face to face meetings, phone calls, community meetings, support annual promotional initiatives				R Provide support to Marketing consultant for local face to face events		R Provide support to Marketing consultant for training CSR during account activation season
Maintenance & Operations of Equipment & Service	R Provide support for field ops root cause analysis	R Report equipment or service issues using outage protocols						R Report equipment or service issues using outage protocols

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AILC Responsibility Matrix

Task	Customer Service Center CSR – Training Specialist	SAIC Developer	CSR Sr Analyst	Regulatory Accounting	System Planning Org	Distribution Ops - Center	Distribution Field Services
A – Accountable for task I – Get informed of event or status R – Responsible for Integrated Functions	Evelyn Brown	Stephen Grillo	Art Cortisimo	Jim Berkas - Mgr	Mike Hall	Ryan Projeasi	Line Supervisors / Svc Men
Marketing	R Provide support to Marketing consultant for training CSR during account activation season.						
Maintenance & Operations of Equipment & Service							R Make emergency repairs during off peak hours and report equipment or service issues using outage protocol. Handle complaints initiated by the customer concerning AILC devices. Forward unsolvable issues to program leaders for rectification

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AILC Meter Installation Process

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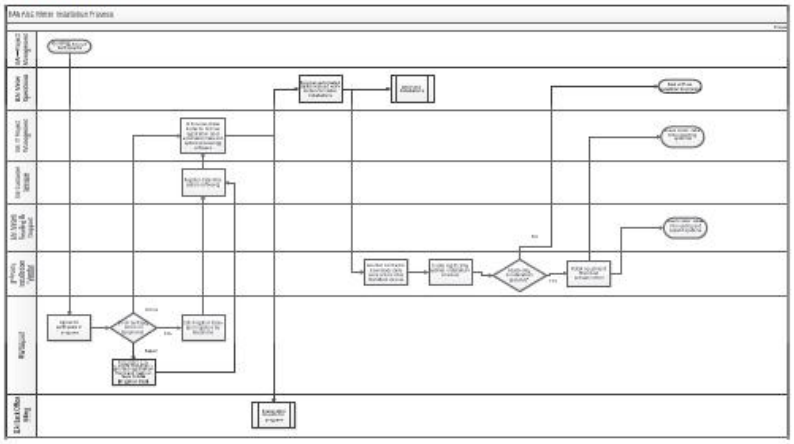

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AILC Participation Process
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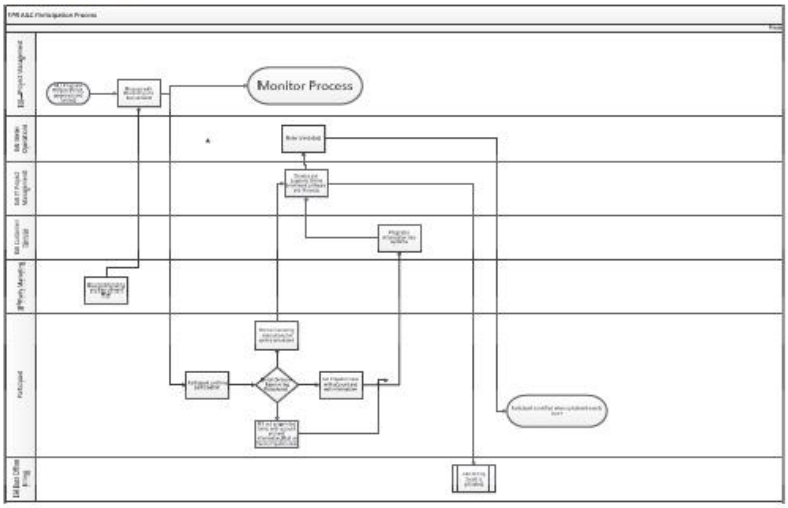

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AILC Procurement Process
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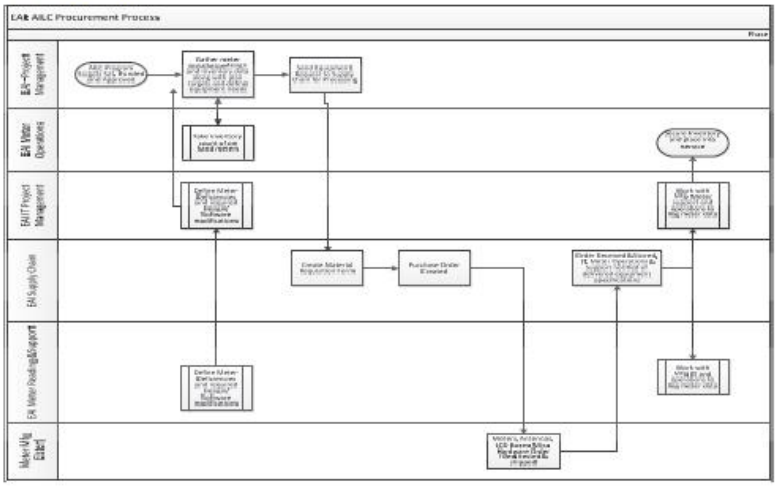

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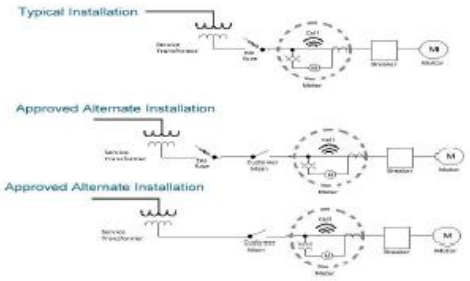
Typical AILC Meter Installation Oneline Diagram



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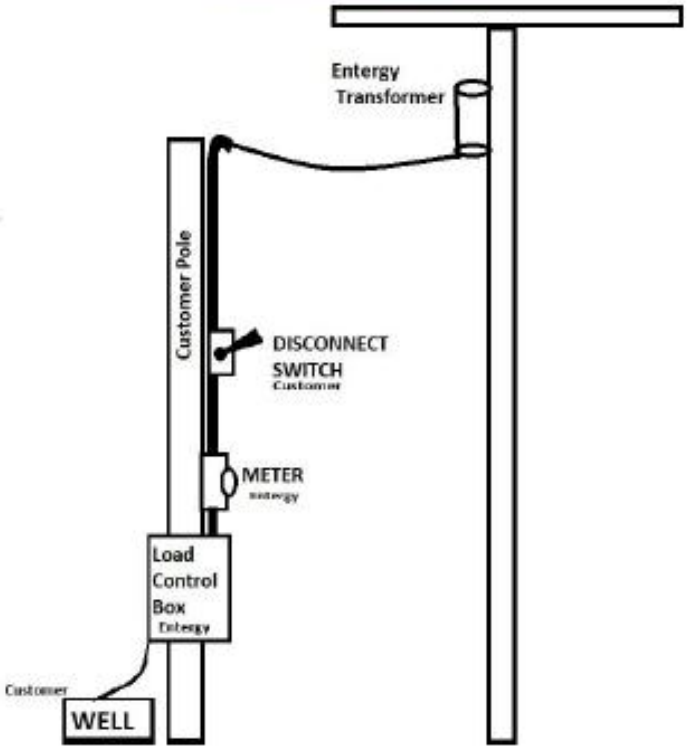
Typical Installation Configuration



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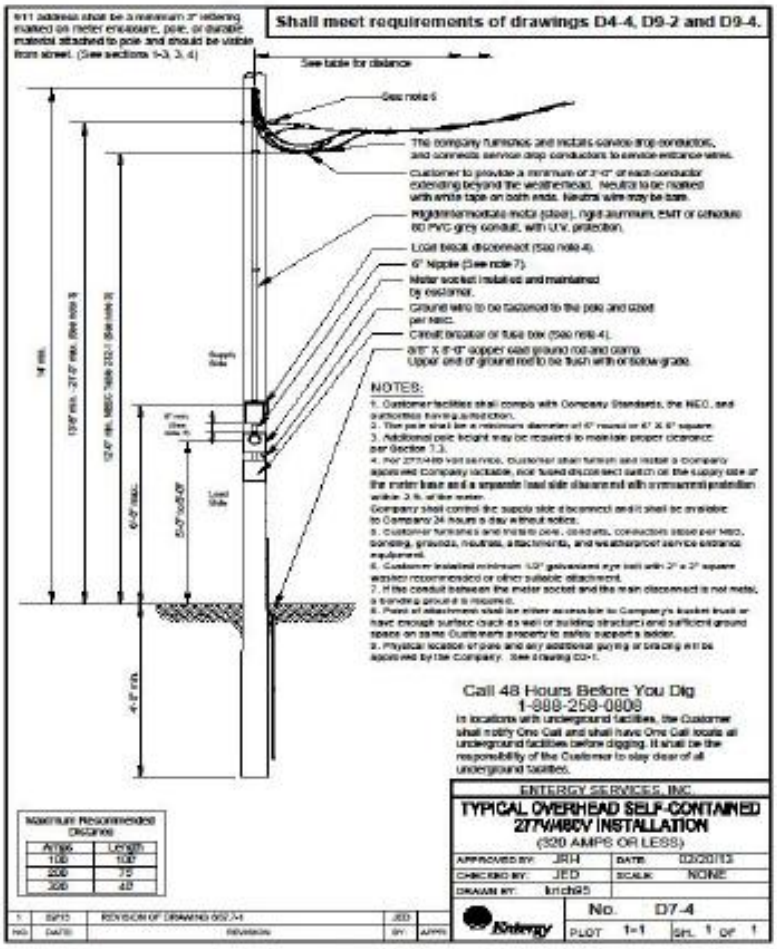
CUSTOMER EQUIPMENT
REQUIREMENTS



10/29/2013

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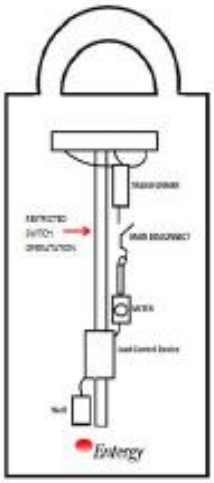
Do Not Operate Switch Tag

FRONT

BACK



10/29/2013

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AMI Meter and LCD Box

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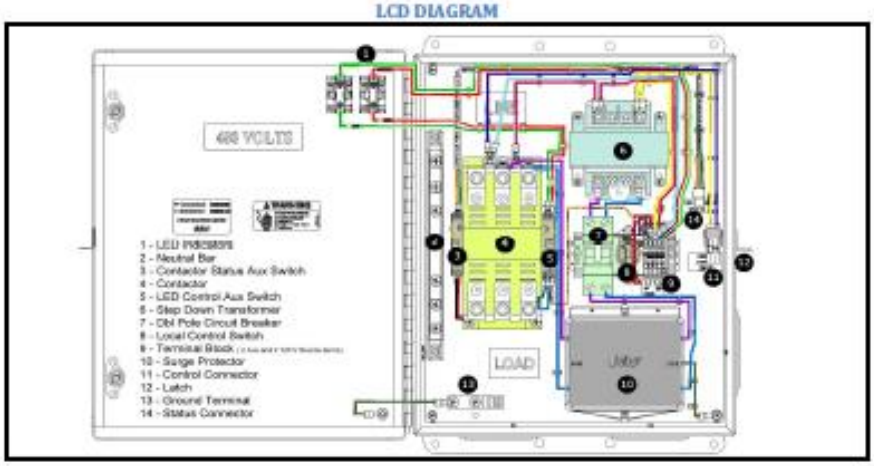
LCD DIAGRAM



LCD WIRING SCHEMATIC

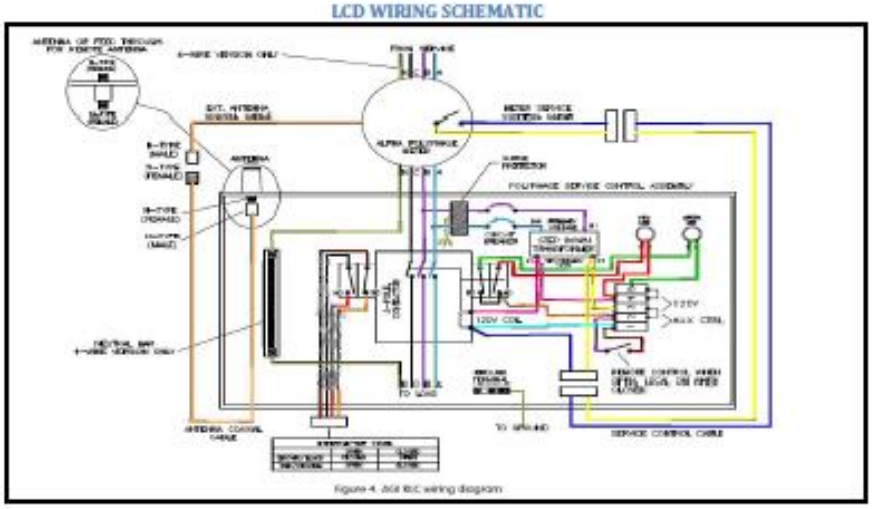


Figure 4. JCC ILC wiring diagram

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Photo of Typical AILC Meter Pre-Installation

Photo of Typical AILC Meter Post-Installation

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AILC TRAINING SLIDES FOR PARTICIPANT ENROLLMENT

(Click on image to access full slides)

This is the Irrigation Load Control Program's home page. This is where you will log in with your already registered account or register an new account by selecting "New User Registration"

10/29/2013

AILC Brochure

How to Enroll

Call or e-mail us:

Contact the Entergy Arkansas Irrigation Desk at **800-324-4709** or e-mail us **aarcscfarmers@entergy.com**.

You may also write us at:

Entergy Arkansas, Inc.
P.O. Box 551
Attn: Customer Operations Support
Little Rock, AR 72203

Sign Up Online

Visit us online at **entergyarkansas.com/loadcontrol** and start saving today.

For More Information

Call **800-324-4709** now to get more information and to assure your place in the program. Or visit our website at **entergyarkansas.com**.

Entergy.
THE POWER OF PEOPLE

A message from Entergy Arkansas, Inc.
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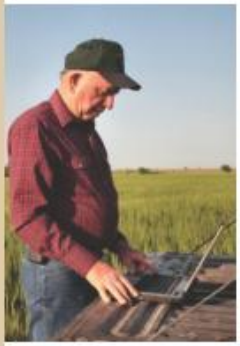
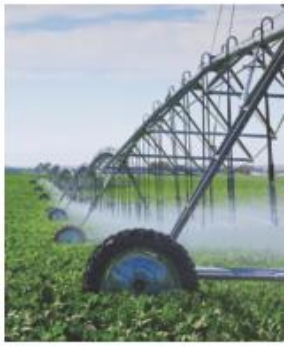
Operate Your Wells From Anywhere





Enroll today to save money, time and hassle this summer by participating in Entergy Arkansas' Agricultural Irrigation Load Control Program.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

AILC Brochure, Reverse

This year, Entergy developed a way for farmers to remotely operate any wells enrolled in the Agricultural Irrigation Load Control (AILC) Program **– directly from your computer, laptop, tablet or smartphone.** Now, you can turn on or off any well from home, in town or in the field anytime of the day or night – anytime of the year.

Program Benefits

- Significant savings on Entergy bills.*
- Operate wells anywhere, anytime with a computer or smartphone.
- No more need to drive from well to well in the middle of the night just to turn them off or on.
- Daily notifications from Entergy Arkansas when wells will be turned off/on.

*All calculations and savings information are estimates for illustration and are based on averages. Your actual saving may vary significantly. Weather, the size and type of equipment and other variables could greatly diminish your actual savings.

Program Basics

- Program period is June 1 through Aug. 31.
- Available to all Entergy Arkansas customers taking service under the Agricultural Water Pumping Service rate schedule.
- Billing credit is $4.16 per kilowatt-hour per month of maximum demand used at each pump for the usage months.
- No installation fees.
- Meters are activated using wireless signals.
- During the program period, Entergy might need to interrupt the electric service to the pump for no more than three hours each weekday, Monday through Friday, between the hours of 12 p.m. and 9 p.m., excluding holidays.
- You may sign up one, some or all of your pumps.
- Maximum irrigation loads and air conditioning loads coincide on hot summer afternoons and place the greatest demand on electricity resources that serve you. This program helps to reduce some of that demand for all customers.

How to Participate

To participate in the AILC Program, you must agree to allow Entergy Arkansas to:

- Install a load control device on your pump, which will turn the power off and on to the pump. There is no installation fee for these devices.
- Allow us to turn off the pump for three hours per day, Monday through Friday, any time between hours of 12 p.m. and 9 p.m., excluding holidays. Pumps will be turned off and on remotely by a two-way communication system designed for our customers.
- Upon request, we will send you texts or emails to let you know when the well is turned off and when the pump is available again after the interruption.
- You can opt out of the AILC Program at any time during June, July and August. Entergy Arkansas will recalculate any credit you have received while in the program then bill you for that amount on the next month's energy bill.

AILC Letter

Entergy.

Entergy Arkansas, Inc.
P.O. Box 3797
Little Rock, AR 72203

February 12, 2013

A & A FARMS
PO BOX 127
TILLAR, AR 71670-0127

Dear A & A FARMS:

Turn your wells on and off from your living room and Entergy Arkansas will pay you to do it !!!

Last year, you may have paid $xxxx more than you had to on your Entergy bills.*

That's our estimate for what you would have saved if your eligible pumps were enrolled in the Agricultural Irrigation Load Control (AILC) Program.

Enclosed is information about how to participate in this year's AILC Program. By working with Entergy Arkansas to schedule your irrigation around peak summer hours, your farm will receive a $4.16 per kilowatt credit, and the savings will be limited to 30 percent of your monthly base bill before adjustments.

New this year is the ability to control your irrigation wells remotely. Now you can turn off or on any well enrolled in the program from a computer, laptop, tablet like an iPad or a smartphone like an iPhone. No need to get up in the middle of the night and drive to a field to turn the well on or off. You can do it all now from an air conditioned home, truck or tractor.

Here's how the program works: the meters are activated using wireless signals. From June through July and only on select days Monday thru Friday and at the most for three hours, Entergy will interrupt electric service to the pump but never on a holiday. For your participation, Entergy will apply a $4.16 per kilowatt credit to the bill for that service month. You may sign up one or all of your pumps, and the credits will occur June through August, as determined by your normal billing date.

Last year this program assisted in keeping the lights on in your community when drought and severe weather threatened community-wide blackouts. Please help in reducing peak load, it will benefit all customers. To register is even easier than in past years. Here's how you can sign up

1

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AILC Letter, page 2

Call: 800-324-4709.
Email: arcscfarmers@entergy.com.
Visit: myaccount.entergy.com/AMI/Login.portal.

NOTE: It costs you NOTHING to cancel your participation in the program. If you find one or more of your pumps cannot be in AILC, all you have to do is contact us.

Thank you for considering this program again, and I look forward to working with you in the AILC Program this year.

Sincerely,

Gabe Munoz
Program Manager

P.S. You'll find out much more about AILC from the enclosed brochure and frequently asked questions. Or, please call and we'll be glad to discuss a plan for you.

*All calculations and savings information are estimates for illustration and are based on averages. Your actual savings may vary significantly. Weather, the size and type of equipment and other variables could greatly diminish your actual savings.

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FREQUENTLY ASKED QUESTIONS:

1. How will the credit be applied?
   The program will provide a $4.16 credit per kilowatt of electricity used for each pump. The total credit could be as much as 30 percent of the base bill amount before adjustments. In the past, accounts using this billing credit saved between 10-15 percent of their bill over three months.

2. Am I eligible for this voluntary program?
   All Entergy Arkansas customers receiving electric service with the Agriculture Water Pumping Service tariff are eligible.

3. Why is Entergy Arkansas implementing this program?
   The Arkansas Public Service Commission has urged Entergy Arkansas to find ways to reduce the total "peak load," the amount of electricity required to serve all our customers during the weekday periods of summer afternoons. Reducing peak load will benefit for all customers.

4. What if I choose to terminate the program before the three months are over? Or, what if I learn my pumps cannot be turned off as frequently as described after I have joined the program?
   You will not be penalized for opting out of the program after you sign up. If you find one or more of your pumps cannot be in AILC, all you have to do is notify us in writing during the contract period. According to the terms of the contract, we will recalculate any credit you have received while in the program then bill you for that amount on the next month's energy bill. We will rebill the pump account to indicate any credit that may have been received during the contract. No penalty fees will be assessed.

5. What if something goes wrong with the meter or the switching controls?
   Installation and maintenance is Entergy's responsibility. The company will give you a telephone number to call that is answered 24 hours every day in case there is a problem.

6. What about other months? Next year? What about pumps other than those listed?
   Entergy Arkansas is expanding the number of accounts that can be placed on this program in the future.

7. Where can I see the terms of the agreement?
   You can view a draft of the terms online by going to http://entergyarkansas.com/irrigation. We also can e-mail you a copy of the agreement or mail one if you will call or email us today:
   PHONE: 800-324-4709.
   EMAIL: arcscfarmers@entergy.com.
   ONLINE: myaccount.entergy.com/AMI/Login.portal.

8. Why is Entergy Arkansas sponsoring this program?

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AILC Letter, page 4

Maximum irrigation loads and air conditioning loads coincide on hot summer afternoons and place the greatest demand on electricity resources that serve you. This program helps to reduce some of that demand.

9. How do I sign up for the program?
   To sign up, contact the Entergy Arkansas Irrigation Desk at:

   800-324-4709 or
   Email us at arcscfarmers@entergy.com or
   Visit us online at: myaccount.entergy.com/AMI/Login.portal.

   We will send you a sign up package that will include the billing discount information and contracts for your signature along with instructions for returning the contract.

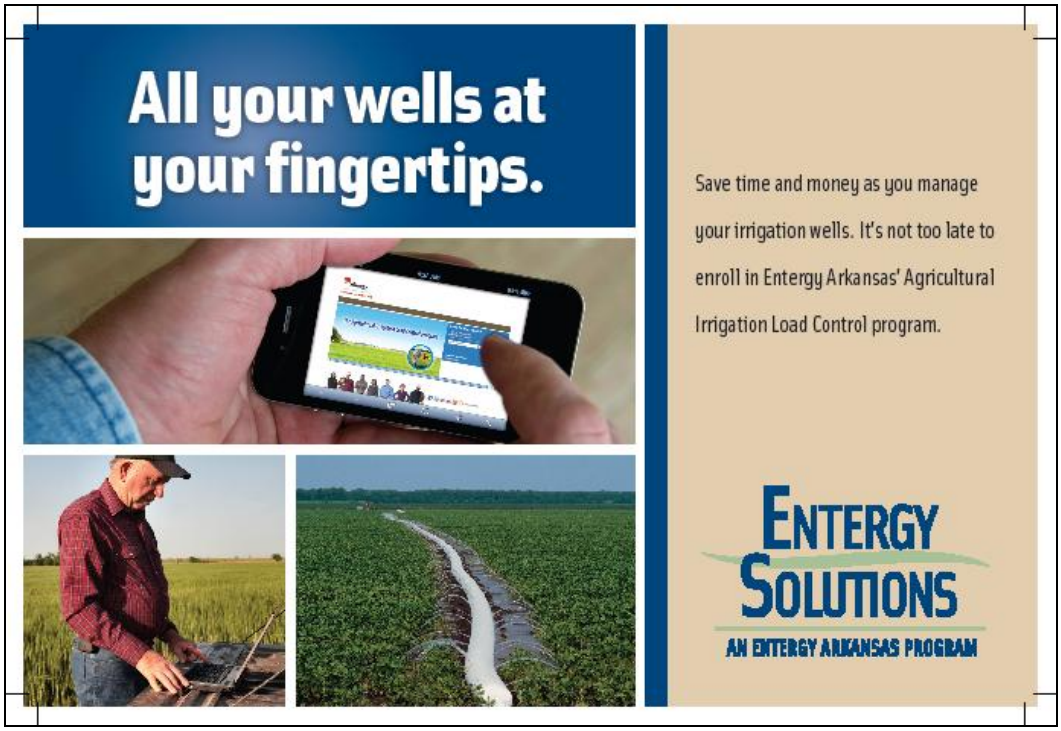
10. What is expected of me to participate?
    To participate in the Agricultural Irrigation Load Control Program, you will need to allow Entergy Arkansas to:
    - Install a load control device on your pump(s) which will turn the power off and on to the pump.
    - Allow us to turn off the pump for three hours per day, Monday through Friday, any time between hours of 12 p.m. until 9 p.m., excluding holidays. Pumps of up to 110 horsepower will be remotely turned off and on by a two-way communication system designed for Entergy Arkansas customers.
    - NOTE: Upon request, we will provide you with text or email notifications when the well is turned off and when the pump is available again after the interruption.

11. Are there any installation fees?
    There are no installation fees. To participate, you must allow Entergy Arkansas and our contractors to access the meter pole. Also, the pole must be in sufficient condition such that we can install the new meter and load control device.

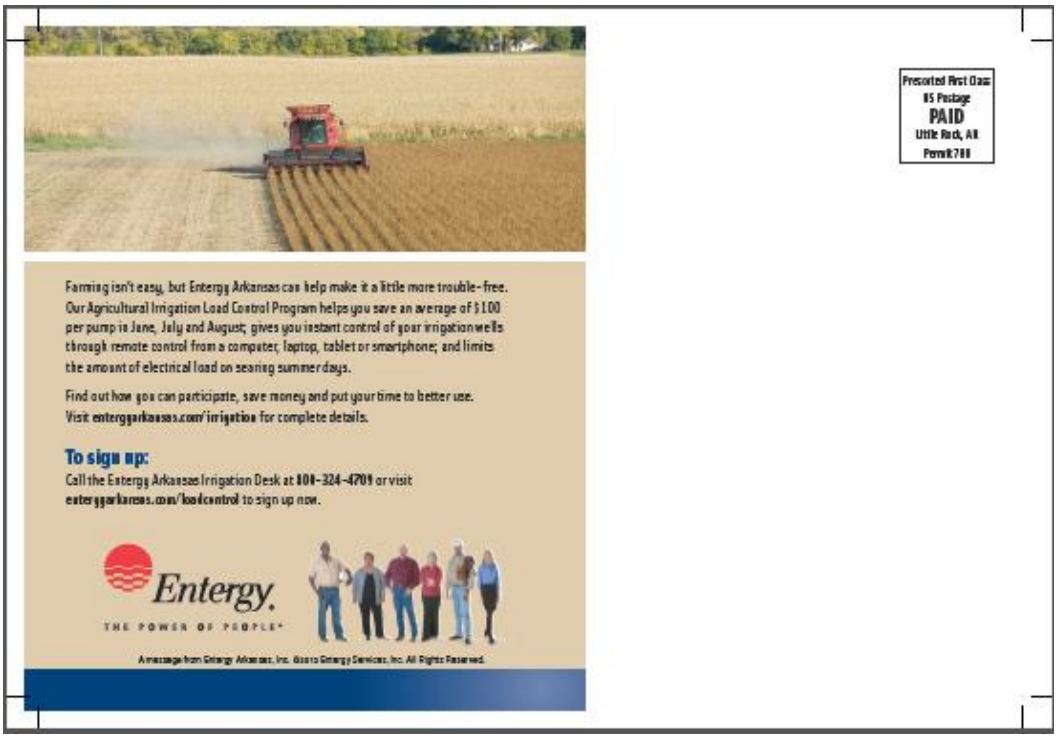
12. How does remote control of my wells work?
    Now when you participate in the program, you can turn your irrigation wells on and off right from your computer or smart phone. What you do is visit AILC Program's home page and register a new account by selecting New User Registration or log in with your registered account if you are returning to the program. This will be your home page, and from there you can view the status of your wells and the last scheduled disconnection. It also has links to control your wells, enroll in or opt out of the AILC Program, update your account profile, manage text messaging and update well information.

    You can do all of this from a computer, laptop, tablet like an iPad or a smartphone like an iPhone. No need to get up in the middle of the night and drive to a field to turn it on or off. You can do it all now from an air conditioned home, truck or tractor.

AILC Postcard



AILC Postcard, Reverse



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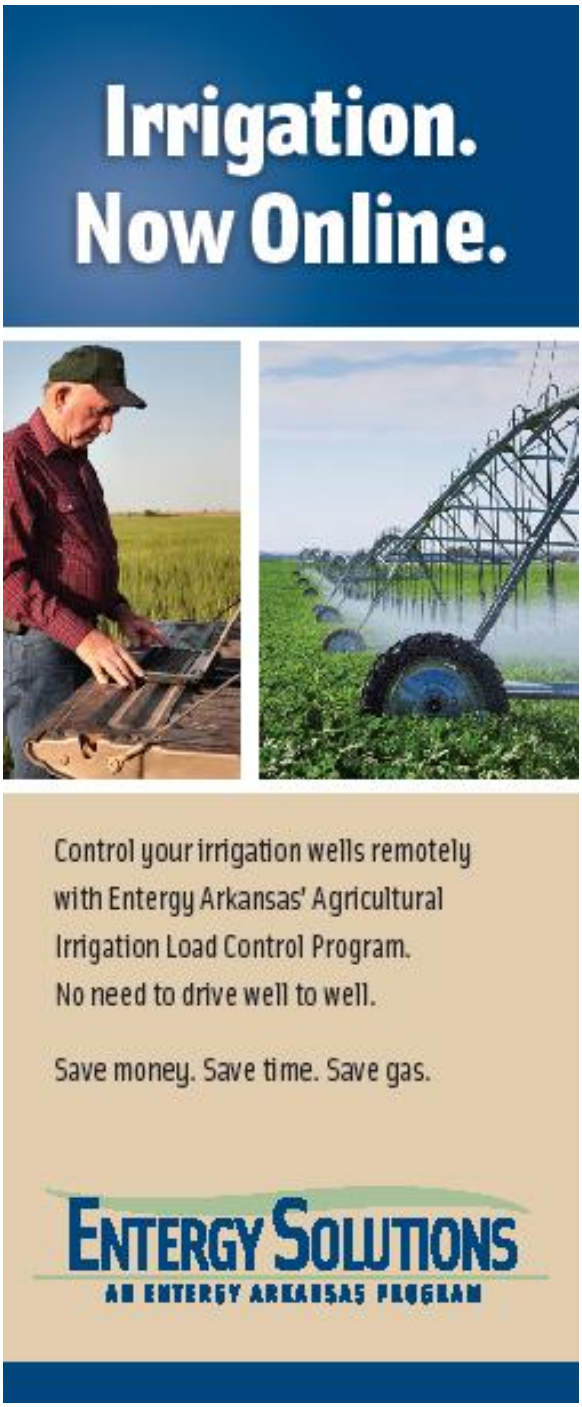
AILC Bill Insert



AILC Bill Insert, Reverse

Entergy Arkansas' improved Agricultural Irrigation Load Control Program lets you remotely turn on and off your participating irrigation wells from your computer or smartphone. You can save an average of $100 per pump per month and have instant, certain control of your irrigation schedule.

For complete details, visit **entergyarkansas.com/irrigation**.

Sign Up Today.

Contact the Entergy Arkansas Irrigation Desk at **800-324-4709** or visit **entergyarkansas.com/loadcontrol** to sign up now.

Entergy®

THE POWER OF PEOPLE®

A message from Entergy Arkansas, Inc.

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AILC Press Release

AILC Press Release

CONTACT INFORMATION

Entergy's Agricultural Irrigation Pump Load Control Can Save Time, Money, Energy for Arkansas Farmers

CITY, AR (Feb. 15, 2013) – The Agricultural Irrigation Pump Load Control (AILC) Program from Entergy Arkansas, Inc. can help reduce Entergy bills for irrigation and allow farmers to manage their wells from their personal computer or smartphone, saving time, saving energy and making control of the wells more convenient.

To participate, farmers agree to let Entergy Arkansas power off their wells for three hours on peak demand weekdays June through August. The greatest demand for electricity occurs in the summer months when customers are using air conditioning to cool their homes and businesses. This peak demand coincides with the time farmers are pumping water into their fields.

"We've offered Irrigation Pump Load Control for several years, but recent improvements in the program added the ability to turn irrigation wells on or off remotely from a computer or smartphone," said **LOCAL MANAGER, TITLE**. "Imagine not having to get up late at night and fight mosquitoes just to turn off a well. Farmers can use AILC to turn their irrigation wells on or off when they need them most from anywhere they have a computer, tablet, smartphone and access to the Internet."

Participants may sign up one or all of their pumps. Entergy pays the cost to install a special meter that can be activated wirelessly and remotely on each irrigation pump that is enrolled.

The farmers receive a credit of $4.16 per kilowatt with savings up to 30 percent off their monthly base bill before adjustments when they agree to allow Entergy to interrupt electric service to participating pumps for three hours each Monday through Friday between the hours of noon and 9 p.m., excluding holidays, during June, July and August.

To participate in the program, interested farmers can call 1-800-324-4709 or email arcscfarmers@entergy.com before **DATE**. The AILC Program closes for enrollment before the interruption months to allow time for equipment installation.

CLOSING ENTERGY PARAGRAPH

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AILC Radio Scripts

RV Rewrite to 2 – 30 sec spots 020513

FARMER 1 - 30sec

ANNCR:	FARMERS ACROSS ARKANSAS ARE saving TIME AND MONEY with Entergy Arkansas' AGRICULTURAL IRRIGATION LOAD CONTROL PROGRAM
FARMER 1:	EVEN IN THE MIDDLE OF THE NIGHT, I CAN TURN OFF MY WELLS FROM MY SMARTPHONE. I DON'T HAVE TO DRIVE FROM WELL TO WELL ANYMORE.
ANNCR:	OPERATE YOUR IRRIGATION PUMPS RIGHT FROM YOUR COMPUTER OR SMARTPHONE. And… GET A CREDIT OF ABOUT $100 PER MONTH PER WELL DURING THE SUMMER.
ANNCR:	SAVE TIME, MONEY and ENERGY. SIGN UP TODAY at ENTERGY ARKANSAS DOT COM SLASH IRRIGATION.

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AILC Radio Scripts, Page 2

FARMER 2 - 30sec

ANNCR:	FARMERS ACROSS ARKANSAS ARE saving TIME AND MONEY with Entergy Arkansas' AGRICULTURAL IRRIGATION LOAD CONTROL PROGRAM
ANNCR:	OPERATE YOUR IRRIGATION PUMPS RIGHT FROM YOUR COMPUTER OR SMARTPHONE. And… GET A CREDIT OF ABOUT $100 PER MONTH PER WELL DURING THE SUMMER.
FARMER 2:	I SAVED THOUSANDS LAST YEAR BY SIGNING UP FOR ENTERGY Arkansas' IRRIGATION PROGRAM. WITH REDUCED LABOR AND GASOLINE COSTS, I'LL SAVE EVEN MORE THIS YEAR.
ANNCR:	SAVE TIME, MONEY and ENERGY. SIGN UP TODAY at ENTERGY ARKANSAS DOT COM SLASH IRRIGATION.

AILC Web Banner Plan

ENTERGY
EAI Entergy Solutions AG Online
2/15/2013

SEM/Target EAI Areas	Visibility	Est Monthly Imp.	Est Monthly Visits	Monthly Cost	2 Cycles
Expanded Keyword Set	90% Visiblity	7,500	420	$2,118	$4,236

Target Markets:

Stuttgart	Dewitt
Brinkley	Searcy
Lake Village	Griffithville
McGehee	Hazen
Dermott	Lonoke
Carlisle	

I hereby authorize The Ramey Agency, LLC to purchase and place commercial advertising time and space on behalf of Entergy Services, Inc. based on the foregoing media plan. Entergy assumes financial responsibility for payment of all advertising placed by The Ramey Agency, LLC. on our behalf in accordance with the foregoing media plan. Upon receipt of client's audited billing regarding media purchases, Entergy shall, subject to any discrepancy adjustments, remit payment in full to The Ramey Agency, LLC. Accordingly, The Ramey Agency, LLC. will pay directly any expenses incurred under any media contracts entered into on Entergy's behalf that The Ramey Agency, LLC. has placed.

APPROVED By:

_____
Authorized Name/Signature

_____
Client/Advertiser

_____
Date

AILC Web Banner Plan Expanded Key Words

arkansas natural resources conservation service
brinkley ar weather
corn planter for sale
county agent
crop forecast
cultivator for sale
delta farm press
delta grow seed company
dermott ar weather
disc cutter for sale
eagle seed extension agent extension service
farm bureau ar
farm bureau insurance
frost dates ar
griffithville ar weather
hazen ar weather
irrigation equipment
irrigation pumps
lake village ar weather
lonoke ar weather
mcgehee ar weather
planting dates ar
planting equipment for sale
pumps for sale
rainfall forecast ar
searcy ar weather
seeder for sale
stratton seed
stuttgart ar weather
tractors for sale
usda farm service agency
well pumps
12 volt well pumps
2 row corn planter for sale
4 row corn planter for sale
above ground well pumps
ag extension service
agricultural extension agent
agricultural extension service
agricultural irrigation equipment
agricultural irrigation pumps
agricultural well pumps
agriculture extension agent
agriculture extension service
agrilife extension service
air seeder for sale
antique well pumps
antique well pumps for sale
ao smith well pumps
arkansas agricultural extension service
arkansas cooperative extension service
arkansas extension service
artesian well pumps
best submersible well pumps
best well pumps
booster pumps for irrigation
brillion grass seeder for sale
brillion seeder for sale
centrifugal irrigation pumps
cheap well pumps
cobb county extension service
colorado extension service
colorado state extension service
colorado state university extension service
commercial irrigation pumps
commercial well pumps
community service extension
constant pressure well pumps
coop extension service
cooperative extension agent
cooperative extension service
cooperative extension service arkansas
cornell extension service
cost of well pumps
county agricultural agent
county agricultural extension agent
county extension agent
county extension service
csu extension service
ct extension service
dayton well pumps
deep well hand pumps
deep well irrigation pumps
deep well jet pumps
deep well pumps
deep well pumps for sale
deep well pumps installation
deep well pumps prices
deep well pumps troubleshooting
deep well submersible pumps
deep well turbine pumps
deep well water pumps for sale
delta farm press magazine
diesel irrigation pumps
diesel irrigation pumps for sale
diesel water pumps for irrigation
domestic well pumps
drilled well pumps
drip irrigation equipment
drip irrigation pumps
eagle seed company
eagle seed forage soybeans
eagle seed forage soybeans for sale
eagle soybean seed
electric irrigation pumps
electric water pumps for irrigation
electric water pumps irrigation
electric well pumps
extension service utah
farm extension service
farm irrigation equipment
farm irrigation equipment for sale
farm irrigation pumps
field cultivator for sale
flotec irrigation pumps
flotec shallow well pumps
flotec well pumps
garden irrigation equipment
garden irrigation pumps
gas powered irrigation pumps

AILC Web Banner Plan Expanded Key Words, Page 2

gas water pumps for irrigation
golf course irrigation equipment
golf course irrigation pumps
gould irrigation pumps
gould shallow well pumps
gould submersible well pumps
gould well pumps
gould well pumps prices
goulds irrigation pumps
goulds pumps submersible well pump
goulds shallow well pumps
goulds submersible well pumps
goulds well pumps
goulds well pumps prices
grass seeder for sale
grundfos submersible well pumps
grundfos well pumps for sale
gwinnett county extension service
hand operated well pumps
hand well pumps
hand well pumps for sale
high pressure irrigation pumps
hillsborough county extension service
home depot irrigation pumps
home depot well pumps
home well pumps
honda irrigation pumps
how do well pumps work
how much do well pumps cost
how well pumps work
image usda farm service agency
installing submersible well pumps
iowa extension service
iowa state extension service
iowa state university extension service
irrigation booster pumps
irrigation equipment for sale
irrigation equipment manufacturers
irrigation equipment supplier
irrigation equipment suppliers
irrigation pumps diesel
irrigation pumps electric
irrigation pumps for ponds
irrigation pumps for sale
irrigation pumps used
irrigation system equipment
irrigation system pumps
irrigation water pumps
irrigation water pumps for sale
irrigation well pumps
jang seeder for sale
jet well pumps
john deere 2 row corn planter for sale
john deere irrigation pumps
la extension service
lake irrigation pumps
land pride seeder for sale
lane county extension service
large irrigation pumps
lawn irrigation equipment
lawn irrigation pumps
local extension service
lowes irrigation pumps
lowes well pumps
manual well pumps
meyers well pumps
montgomery county extension service
myers irrigation pumps
myers water well pumps
old well pumps
pinellas county extension service
planet jr seeder for sale
planet junior seeder for sale
portable irrigation pumps
power seeder for sale
pressure tanks for well pumps
pto driven irrigation pumps
pto irrigation pumps
pto irrigation pumps for tractors
pumps for irrigation
pumps irrigation
pumps well
red jacket well pumps
residential irrigation pumps
residential well pumps
ruth berry well pumps
service extension
shallow well hand pumps
shallow well jet pumps
shallow well pumps
shallow well pumps for sale
shallow well water pumps
simer well pumps
sizing well pumps
slit seeder for sale
small irrigation pumps
solar deep well pumps
solar irrigation pumps
solar powered irrigation pumps
solar powered pumps for irrigation
solar powered water pumps for irrigation
solar powered well pumps
solar pumps for irrigation
solar submersible well pumps
solar water pumps for irrigation
solar water pumps irrigation
solar well pumps
sprinkler irrigation pumps
sprinkler well pumps
sta rite submersible well pumps
sta rite well pumps parts
state extension service
submersable well pumps
submersible deep well pumps
submersible irrigation pumps
submersible pumps for irrigation
submersible water well pumps
submersible well pumps
submersible well pumps for sale
submersible well pumps prices

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AILC Web Banner Plan Expanded Key Words, page 3

submersible well pumps troubleshooting
submersible well water pumps
troubleshooting well pumps
two row corn planter for sale
types of well pumps
u of a cooperative extension service
u of a extension service
university of arkansas cooperative extension service
university of arkansas extension service
usda crop forecast
usda extension service
used brillion seeder for sale
used diesel irrigation pumps
used farm irrigation equipment
used irrigation equipment
used irrigation equipment for sale
used irrigation pumps
used irrigation pumps for sale
used irrigation pumps sale
used well pumps
used well pumps for sale
utilitech well pumps
vacuum seeder for sale
valley irrigation equipment
water irrigation pumps w
ater pumps for irrigation
water pumps irrigation
water well jet pumps
water well pumps
water well pumps for sale
water well pumps sale
water well pumps submersible
water well submersible pumps
wayne deep well pumps
wayne irrigation pumps
wayne shallow well pumps
wayne well pumps
well booster pumps
well hand pumps
well jet pumps
well point pumps
well pumps and pressure tanks
well pumps and tanks
well pumps for sale
well pumps gould
well pumps installation
well pumps lowes
well pumps parts
well pumps prices
well pumps problems
well pumps residential
well pumps submersible
well pumps systems
well pumps troubleshooting
well submersible pumps
well water pressure pumps
well water pumps for sale

AILC 2013 Media Schedule AG Network & Local

ENTERGY
EAI Entergy Solutions AG Plan
February 14, 2013

Target: Farmers qualifying for AILC in mainly rural counties where aquaculture predominate		#Wks/ Mos.	Total Gross Cost	January				February				March				April				May				June				July				August				September				October				November				December			
				31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	16	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	6	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23
Radio, M-F 6a-10a	:30 Spots/Wk	6 weeks	$13,470																																																		
Stuttgart - (covered by ARN-AG)																																																					
Brinkley - (covered by ARN-AG)																																																					
Lake Village - (covered by ARN-AG & Dermott)																																																					
Mogahea - (covered by ARN-AG)																																																					
Dermott - KXSA-FM	5x		$300																																																		
Carlisle - (covered by Des Arc & ARN-AG)																																																					
Dewitt - (covered by ARN-AG)																																																					
Searcy - KWCK-FM (and covered by Des Arc)	5x		$870																																																		
Griffithville - (covered by Searcy & Des Arc)																																																					
Hazen - (covered by ARN-AG & Des Arc)																																																					
Lonoke - (covered by ARN-AG)																																																					
ARN-AG Network (5x/wk per station - list attached)	5x		$12,000																																																		
Des Arc - KFLJ-FM	5x		$300																																																		
Total Campaign Gross Budget			**$13,470**																																																		

Total Client Cost **$12,594**

I hereby authorize The Ramey Agency, LLC to purchase and place commercial advertising time and space on behalf of Entergy Services, Inc. based on the foregoing media plan. Entergy assumes financial responsibility for payment of all advertising placed by The Ramey Agency, LLC, on our behalf in accordance with the foregoing media plan. Upon receipt of client's audited billing regarding media purchases, Entergy shall, subject to any discrepancy adjustments, remit payment in full to The Ramey Agency, LLC. Accordingly, The Ramey Agency, LLC. will pay directly any expenses incurred under any media contracts entered into on Entergy's behalf that The Ramey Agency, LLC. has placed.

APPROVED By:

Authorized Name/Signature

Client/Advertiser

Date

AILC 2013 Media Schedule ARN & Local

ENTERGY
EAI Entergy Solutions AG Plan
February 14, 2013

Target: Farmers qualifying for AILC in mainly rural counties where aquaculture predominate		#Wks/ Mos.	Total Gross Cost	January				February				March				April				May				June				July				August				September				October				November				December			
				31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	16	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	6	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23
Radio, M-F 6a-10a	:30 Spots/Wk	6 weeks	$11,690																																																		
Stuttgart - (covered by ARN)																																																					
Brinkley - (covered by ARN)																																																					
Lake Village - (Covered by ARN & Mcgehee)																																																					
Mcgehee - KVSA-AM (and covered by Dewitt)	5x		$140																																																		
Dermott - (covered by ARN & Mcgehee)																																																					
Carlisle - (covered by ARN & Des Arc)																																																					
Dewitt - KDEW-FM	5x		$630																																																		
Sheridan - (covered by ARN & Des Arc)			$870																																																		
Griffithville - (covered by ARN & Des Arc)																																																					
Hazen - (covered by ARN & Des Arc)																																																					
Lonoke - (covered by ARN)																																																					
Arkansas Radio Network (ARN) M-F 6a-3p (5x/wk per station - list attached)	5x		$9,750																																																		
Des Arc - KFLJ-FM	5x		$300																																																		
Total Campaign Gross Budget			**$11,690**																																																		

Total Client Cost **$10,930**

I hereby authorize The Ramey Agency, LLC to purchase and place commercial advertising time and space on behalf of Entergy Services, Inc. based on the foregoing media plan. Entergy assumes financial responsibility for payment of all advertising placed by The Ramey Agency, LLC. on our behalf in accordance with the foregoing media plan. Upon receipt of client's audited billing regarding media purchases, Entergy shall, subject to any discrepancy adjustments, remit payment in full to The Ramey Agency, LLC. Accordingly, The Ramey Agency, LLC. will pay directly any expenses incurred under any media contracts entered into on Entergy's behalf that The Ramey Agency, LLC. has placed.

APPROVED By:

Authorized Name/Signature

Client/Advertiser

Date

AILC 2013 Media Schedule Local

ENTERGY
EAI Entergy Solutions AG Plan
February 14, 2013

Target: Farmers qualifying for AILC in mainly rural counties where aquaculture predominate		#Wks/ Mos.	Total Gross Cost	January				February				March				April				May				June				July				August				September				October				November				December			
				31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	16	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	6	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23
Radio, M-F 6a-10a	:30 Spots/Wk	6 weeks	$8,675																																																		
Stuttgart - KWAK-FM (and covered by Dewitt)	5x		$510																																																		
Brinkley - (covered by Little Rock)																																																					
Lake Village - (Covered by Dermott & Mogahee)																																																					
Mogahee - KVSA-AM (and covered by Dewitt)	5x		$140																																																		
Dermott - KXSA-FM (and covered by Mogahee)	5x		$300																																																		
Carlisle - (covered by Little Rock & Des Arc)																																																					
Dewitt - KDEW-FM (and covered by Stuttgart)	5x		$630																																																		
Searcy - KWCX-FM (and covered by Des Arc)	5x		$870																																																		
Griffithville - (covered by Searcy & Des Arc)																																																					
Hazen - (covered by Little Rock & Des Arc)																																																					
Lonoke - (covered by Little Rock)																																																					
Little Rock - KBBN-FM and KABZ-FM (5x/wk per station)	10x		$5,925																																																		
Des Arc - KFLJ-FM	5x		$300																																																		
Total Campaign Gross Budget			$8,675																																																		

Total Client Cost **$8,111**

I hereby authorize The Ramey Agency, LLC to purchase and place commercial advertising time and space on behalf of Entergy Services, Inc. based on the foregoing media plan. Entergy assumes financial responsibility for payment of all advertising placed by The Ramey Agency, LLC, on our behalf in accordance with the foregoing media plan. Upon receipt of client's audited billing regarding media purchases, Entergy shall, subject to any discrepancy adjustments, remit payment in full to The Ramey Agency, LLC. Accordingly, The Ramey Agency, LLC. will pay directly any expenses incurred under any media contracts entered into on Entergy's behalf that The Ramey Agency, LLC. has placed.

APPROVED By:

Authorized Name/Signature

Client/Advertiser

Date

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2.11 New Homes Program

New Homes Program Manual

Entergy Arkansas, Inc.

2013 New Homes Program Manual

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Prepared by:

ICF International
Little Rock, AR

Contact:

866-527-9177
EntergySolutions@icfi.com
entergyarkansas.com

Version 1.2
Revised June 1, 2013

Entergy
THE POWER OF PEOPLE

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Entergy Arkansas 2013 New Homes Program Manual

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Program Overview

The Entergy Arkansas New Homes Program awards financial incentives to homebuilders who complete and submit certification of the construction of qualified energy-efficient new homes in the Entergy Arkansas electric service area permitted beginning January 31, 2012 and completed between January 1, 2013 and December 31, 2013.

Three types of incentives are available:

Tier 1: $300 for each special rate home rebate. This rebate typically applies to developments and projects that receive special funding with above code requirements. These homes are reviewed and approved on a case by case basis.

Tier 2: $600 for each High Performance home, based on ENERGY STAR® Version 2.5 guidelines

Tier 3: $1,000 for each ENERGY STAR qualified home, based on current ENERGY STAR guidelines

Note: All applications are subject to a free-rider verification. An application considered a free-rider will be disqualified from program participation. A free-rider is someone who would install an energy efficiency measure without any program incentives or intervention.

Program Participation

All homes in the Entergy Arkansas New Homes Program are certified to meet strict guidelines for energy efficiency. A Residential Energy Services Network (RESNET)-accredited independent Home Energy Ratings System (HERS) Rater is required to verify this certification through use of an approved energy use simulation program and a series of on-site inspections and diagnostic tests.

Following is a summary of the basic steps involved to qualify homes for this program:

1. Complete and submit a program application.
2. For Tier 3 ENERGY STAR homes, complete the ENERGY STAR Online Partnership Agreement.
3. For all Tiers, select a RESNET-accredited HERS Rater.
4. Work with your HERS Rater to identify the energy efficiency measures needed to meet or exceed the High Performance (Tier 1 and 2), ENERGY STAR (Tier 3) specifications.
5. Build homes according to the measures you have selected.
6. Determine the best testing methodology to certify your homes (Performance or Prescriptive Path).
7. Conduct on-site inspections and home performance testing.
8. Obtain an ENERGY STAR label and certificate from your HERS Rater for each ENERGY STAR qualified home.

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Reporting Requirements

Entergy Arkansas is required to collect certain data from homes that are delivered to the New Homes Program. This data is usually collected by the HERS Rater during the final performance testing of the home. Homebuilders should work closely with their HERS Rater to ensure this information is submitted to Entergy Arkansas in a timely manner. Financial incentives will only be paid after Entergy Arkansas receives the required information and verifies its accuracy.

To receive incentives:

1. All required data for each home must be entered into the online reporting system.
2. The homebuilder must submit an invoice generated from the online reporting system with home addresses that match the certificates submitted by the HERS Rater.
3. The HERS Rater must submit either a corresponding ENERGY STAR certificate or HERC certificate displaying the corresponding HERS Index.

Online Reporting System Instructions

To receive incentives:

1. All required data for each home must be entered into the online reporting system.
2. The homebuilder must submit an invoice generated from the online reporting system with home addresses that match the certificates submitted by the HERS Rater.
3. The HERS Rater must submit either a corresponding ENERGY STAR certificate or HERC certificate displaying the corresponding HERS Index.

Online Data Entry Instructions

Following are instructions for using our Online Data Entry Tool. Instructions for both homebuilders and HERS Raters are included. Please contact your Account Manager if you have any questions or issues when using the Online Data Entry Tool.

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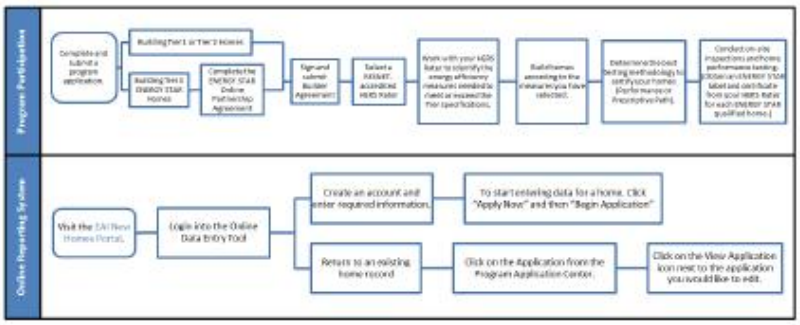

Logging into the Online Data Entry Tool

- To **log in to the Online Data Entry Tool**, navigate to **http://newhomesEAI.programprocessing.com**. Click on the "Create Account" button, enter the required information and click the "Submit Information" button. Your username on the site will be your email address, and the password will be whatever password you entered on the "Create Account" screen. Once you are logged into the site, you are now ready to start entering data for a home.

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- To **Start Entering Data for a Home**, click on Apply Now in the top navigation bar, and then click the "Begin Application" button.

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- To **Return to an Existing Home Record** navigate to **http://newhomesEAI.programprocessing.com**. Click on Login in the top navigation bar, and then enter your username (email address) and password. Click on the "Account Login" button and you will be directed to the Program Application Center. Click on the Application tab to access a list of all applications you have submitted. Click on the View Application icon next to the application you would like to edit. In the window that opens, click on the Application tab. If your application is open for editing, there will be an "Edit Application" button at the top. If there is no "Edit Application" button at the top, then your application is not currently available for editing. Please contact your Account Manager for more information.

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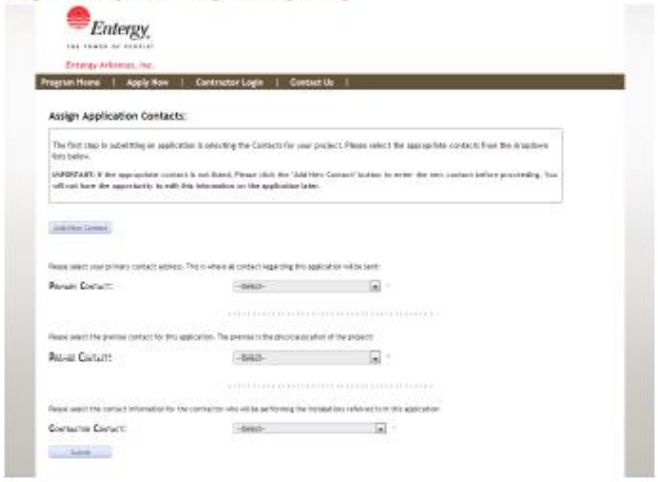
Assign Contacts for the Home you are Registering



Homebuilders:

- Under the Primary Contact drop-down list, select the name of the primary builder contact for the home you are registering. If a name that is not listed is the appropriate primary contact, follow the instructions to add a new contact.
- Under the ContractorContact drop-down list, select the approved Home Energy Rater responsible for the home you are registering.
- Click Submit.

Raters:

- Under the Primary Contact drop-down list, click the Add New Contact button and add the name of the primary builder contact that should be associated with this home record. The contact type should be "primary," the contact name should be "Builder," the account number and Tax ID should be completed as "N/A." Click submit.
- Under the Primary Contact drop-down list, select the nameof the builder contact you just added under the previous step.
- Under the Contractor Contact drop-down list, select your HERS Rating company name.
- Click Submit.

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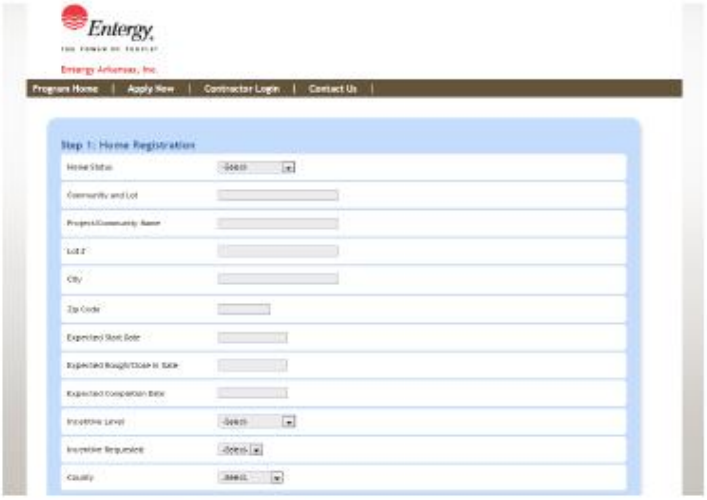
Data Entry Instructions (Your Registration Screen)

Step 1: Home Registration

- Complete all fields in the Home Registration section.
  - For the Expected Start Date and Expected End Date fields, click within the field to open the selection calendar. Dates must be selected from the calendar rather than manually entered.
- If you have data to enter under Steps 2 or 3 at this time, continue on.
- If you are only entering the home registration data for Step 1 during this session, click Submit to save the information you entered.
  - The system will take you to the Program Application Center. Click on the Applications tab and you will see all of the applications in the system.
  - You may Log Out via the button on the Welcome screen or by closing your browser. Or, click the Register Home Now link to the left to start the process for another home.
  - Program staff will review the home registration data and notify you of any issues. After Program staffers have completed their review, you may reopen the form for editing.



Step 2: Data to be Entered by Home Start

- If you are coming back to enter data under Step 2 after your first registration session, log back into the system where you will be taken to the Program Application Center. Click on the Applications tab. Find the desired registration in the list and click the "View" button. You can find the desired home by typing in the community and lot in the search box at the top of the Program Application Center.

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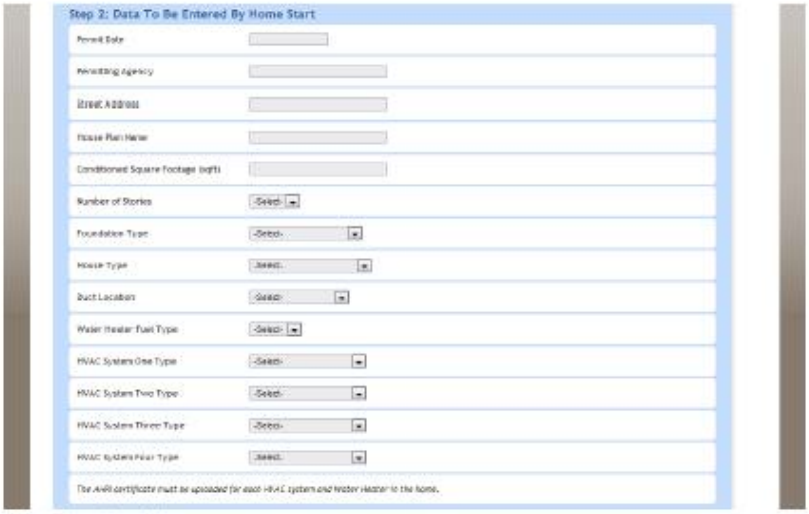
- Select the Application tab and click the "Edit Application" button at the top. (Note that if this button does not appear, Program staffers have not yet reviewed the previously submitted data and reopened the online form for editing.)
- Complete all fields in the Home Start section.
  - For the Permit Date field, click within the field to open the calendar. Dates must be selected from the calendarrather than manually entered.
- Click Submit. This will save the form; (via the Edit Application button) so you can log on and off the system as needed to add data until you are ready to submit the updates for review.



Step 3: Home Completion

- If you are coming back to enter data under Step 3, log back into the system where you will automatically be taken to the Program Application Center. Click on the Applications tab. Find the desired registration in the list and click the "View" button.
- Here you will enter the Entergy Arkansas Meter Number.
- Select the Application tab and click the "Edit Application" button at the top.
- Complete all fields in the Home Completion section.
  - The system can accept information for up to four HVAC systems per home. If the home you are registering does not have four systems, please enter N/A in the extra fields for HVAC equipment.
  - Go back to the workflow screen and upload the necessary AHRI Certificates for your heating and cooling equipment and your water heater. These certificates can be provided by your HVAC contractor and your plumbing contractor.
- **Raters:**

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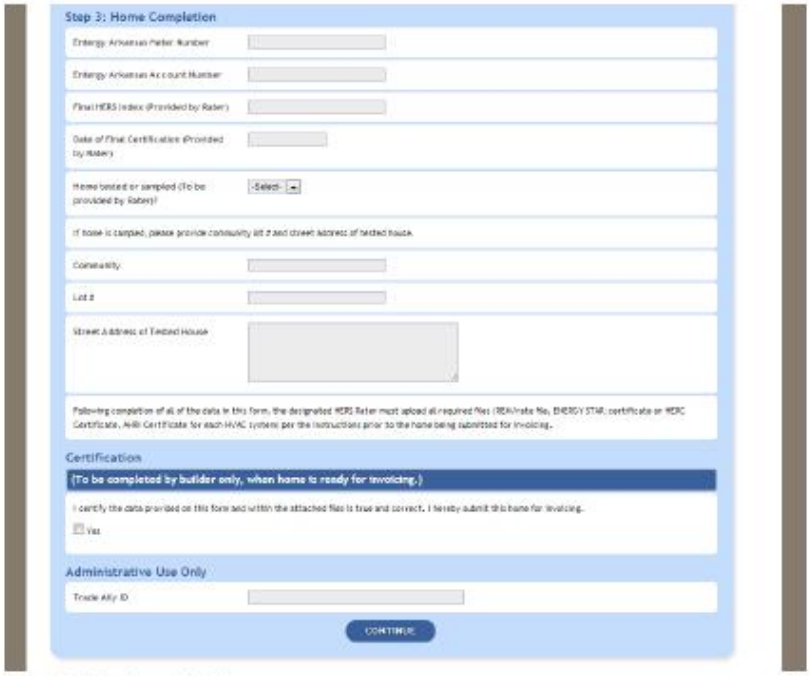
- Log back into the system where you will be taken to the Program Application Center. Click on the Applications tab. Find the desired registration in the list and click the "View" button and then go to the "Your Tasks" tab.
- Click on the "?" next to the Upload REM/Rate File, Upload AHRI Cert, and Upload Certificate tasks. All of these documents must be uploaded. On the File Upload window, click Browse. Navigate to and select the appropriate file, then click Open. Click Upload to upload the file to the online system. Builders can also upload AHRI Certificates as well as ENERGY STAR certificates to the system.
- Click the Refresh icon at the top right of the screen. The screen should refresh to show a green checkmark next to each successfully uploaded document.



Step 4: Certification and Invoicing

- Once all the information in the first three steps is entered and the required documentation has been uploaded by the Rater, the BUILDER must review the certification language and click the "Yes" checkbox to indicate agreement.

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- Click on the "Contact us" tab. Send a message indicating that all the information has been uploaded.
- Program staff will review the home completion and invoicing data and attachments. We will notify you of any deficiencies or notify you that the home has been approved for payment.

Program Training

Entergy Arkansas will provide homebuilders with the training necessary to promote High Performance and ENERGY STAR qualified homes, communicate the associated benefits of buying an energy-efficient home and how to improve their homes' energy performance.

Quality Assurance and Quality Control

Neither Entergy Arkansas, Inc. nor ICF makes any guarantee or any other representation or warranty, expressed or implied, as to the quality or effectiveness of any product(s) provided or work(s) performed through this program.

Energy efficiency gains are subject to a number of variable conditions and circumstances. While it is the intent of the Program to achieve energy efficiencies, neither Entergy Arkansas, Inc. nor ICF International guarantees or warrants that any specific energy efficiency gains will be achieved for a particular customer participating in the program.

Promoting and Selling Energy-Efficient Homes

Demonstrate your commitment to energy efficiency by promoting your High Performance and ENERGY STAR qualified homes to your customers.

- Include information about the energy performance of your homes on your sales sheets.
- Include a page or section on energy efficiency on your website.
- Identify yourself as a builder of energy-efficient homes in your advertisements.
- Display an ENERGY STAR branded yard sign or flag at your ENERGY STAR qualified homes.
- Place ENERGY STAR promotional materials near ENERGY STAR qualified appliances.

Marketing Materials

All participating homebuilders will be provided with free marketing materials for use at model homes, events and in communities. These items are courtesy of Entergy Arkansas. In addition, a variety of resources and materials are available to ENERGY STAR homebuilder partners.
Brochures, fact sheets and posters describing energy-efficient HVAC systems, duct sealing and other topics are available. Standard shipping is provided free of charge to all ENERGY STAR Partners. Visit energystar.gov/publications to view and order these items.

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ENERGY STAR Web Linking Policy

ENERGY STAR partners have the opportunity to have a link from the ENERGY STAR website to their website. This is a valuable resource as energystar.gov receives tens of thousands of visitors per month.

To qualify, the partner's website must comply with the ENERGY STAR Web Linking Policy:

- Display the ENERGY STAR name and logo (used in compliance with the ENERGY STAR Identity Guidelines).
- Reference or provide a reciprocal link to the ENERGY STAR website for more information about the program.
- Include a brief description of participation in ENERGY STAR.
- The link from the ENERGY STAR website will be directed to the page on the partner's site that contains these required elements.

Note that meeting the Web Linking Policy is optional. Active partners who do not wish to comply will continue to be listed on the ENERGY STAR website, but will not have a link to their sites.

After meeting the above requirements, please email hotline@energystar.gov to request a review of your Web page for compliance with the policy.

New Homes Overview

Homebuilder Overview

Build comfortable, energy-efficient homes – and potentially build your business – through the Entergy Arkansas New Homes Program.

The Entergy Arkansas New Homes Program awards financial incentives to homebuilders who submit qualified new homes built in the Entergy Arkansas service area. Under this program, three types of incentives are available:

Tier 1: $300 for each Special Rate home.

Tier 2: $600 for each High Performance home.

Tier 3: $1,000 for each ENERGY STAR® certified home.

How to Participate

All interested homebuilders must complete and submit an application for the program. Entergy Arkansas will review all applications, and selected homebuilders will be notified in writing of the number of homes eligible for incentives. Homebuilders may choose to accept or decline the incentive award offer.

In addition to the Entergy Arkansas program application, all participating homebuilders interested in constructing ENERGY STAR certified homes are required to fill out an Online Partnership Agreement with the National ENERGY STAR New Homes Program. The agreement is located online at: energystar.gov/homesPA.

Home Testing and Certification

All homes in the Entergy Arkansas New Homes Program that are certified must meet strict guidelines for energy efficiency. A Residential Energy Services Network-accredited independent Home Energy Ratings System Rater is required to verify this certification through use of an approved energy-use simulation program and a series of on-site inspections and diagnostic tests.

ENTERGY SOLUTIONS
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Ready to Get Started?

Learn more about the Entergy Arkansas New Homes Program by visiting us online at entergyarkansas.com, calling us at 866-627-9177 or by emailing us at entergysolutions@icfi.com.

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New Homes Overview, Reverse

The following is a summary of the basic steps involved to qualify homes for this program:

1. Complete and submit a program application.
2. For Tier 2 ENERGY STAR certified homes, complete the ENERGY STAR Online Partnership Agreement as described above.
3. For all Tiers, select a RESNET-accredited HERS Rater.
4. Work with your HERS Rater to identify the energy efficiency measures needed to meet or exceed Special Rate (Tier 1), High Performance (Tier 2) or ENERGY STAR (Tier 3) specifications.
5. Build homes according to the measures you have selected.
6. Determine the best testing methodology to certify your homes (Performance or Prescriptive Path).
7. Conduct on-site inspections and home performance testing.
8. Obtain an ENERGY STAR label and certificate from your HERS Rater for each ENERGY STAR certified home.

Reporting Requirements

Entergy Arkansas is required to collect certain data from homes and deliver them to the New Homes Program. This data is usually collected by the HERS Rater during the final performance testing of the home. Homebuilders should work closely with their HERS Rater to ensure this information is submitted to Entergy Arkansas. Financial incentives will only be paid after Entergy Arkansas receives the required information and verifies the accuracy of the report.

To receive incentives:

1. All required data for each home must be entered into the online reporting system.
2. The homebuilder must submit an invoice generated from the online reporting system with home addresses that match the certificates submitted by the HERS Rater.
3. For a Tier 1 or Tier 2 home, the HERS Rater must submit a corresponding ENERGY STAR report displaying the corresponding HERS Index.
4. For a Tier 3 home, the HERS Rater must submit a corresponding ENERGY STAR report displaying the corresponding HERS Index along with all of the required checklists.

Please note: A applicant considered a "Free Rider" will be disqualified from program participation. A "Free-Rider" is someone who would install an energy efficiency measure without any program incentives or intervention.

Participation Benefits

- Up to $1,000 in rebates per qualified home.
- Free sales and technical training courses.
- Marketing support, including free marketing materials.
- Support from a program account manager.

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New Homes QA/QC Verification Checklist

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Entergy Arkansas New Homes Program: QA/QC Visual Verification Checklist

HOME INFORMATION

Date	Homebuilder		Subdivision
Street Address	City	State	ZIP Code
Orientation	Number of Stories	☐ Attached Home	☐ Detached Home

HVAC INFORMATION

AC Condenser Model #	AC Coil Model #	SEER Efficiency	AHRI#
AC Condenser Model #	AC Coil Model #	SEER Efficiency	AHRI#
AC Heat Type ☐ Heat Pump ☐ AC	Attic Access Door ☐ Pass ☐ Fail		

INSULATION INFORMATION

Attic Insulation	Type:	Material:	Grade:
Ceiling Insulation	Type:	R-Value:	
Wall Insulation	Type:	R-Value:	

ADDITIONAL INFORMATION

Radiant Barrier? ☐ Yes ☐ No	Method of Duct Sealing ☐ Mastic ☐ Tape	Program Rep.
CFLs more than 95%? ☐ Yes ☐ No	ENERGY STAR® Windows	UV	SHGC
ENERGY STAR Dishwasher? ☐ Yes ☐ No	Any major visual defects? ☐ Yes ☐ No	Corrective Action recommended? ☐ Yes ☐ No

COMMENTS

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New Homes Resource Kit

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Entergy Arkansas New Homes Program

Resource Kit Contents

Entergy Arkansas Program Materials

- Entergy Arkansas Program Guidebook.
- Program Contact Information.
- Approved Rating Companies: Contact Information.
- Useful Web Links.

Appraising Energy-Efficient Homes

- Earth Advantage Institute Addendum on Appraising High Performance Homes.
- Appraising ENERGY STAR® Homes Presentation.

Building Energy-Efficient Homes

- HVAC System Quality Installation.
- Thermal Enclosure System Rater Checklist Presentation.
- Thermal Enclosure System Rater Checklist Guidebook.
- ENERGY STAR Version 3.0 Training Presentation.
- Water Management System Builder Checklist Guidebook.
- Water Management System Presentation.

Financing Energy-Efficient Homes

- Financing Guidebook.
- RESNET Mortgage Industry National HERS Standards.

Sales and Marketing Resources

- Marketing Materials Contact List.
- ENERGY STAR Certified Homes Consumer Brochure.
- ENERGY STAR HVAC Factsheet.
- ENERGY STAR Independent Inspection Factsheet.
- ENERGY STAR Lighting and Appliances Factsheet.
- Sales Process for ENERGY STAR New Homes.
- Sales Quick Reference Guide.
- Sample Internal Announcement Email.
- Sample Press Release.
- Sample Web Copy.

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Entergy Arkansas New Homes Program

Program Contact Information

Name	Telephone	Email	Help With:
Terry Kessinger, Program Manager	501-244-9564	terry.kessinger@icfi.com	- Incentive Payments. - Plan Reviews. - Technical Questions.
Steve Ellison, Program Manager	469-467-4403	steven.ellison@icfi.com	- Online Reporting System. - Technical Questions. - Incentive Payments.
Ambika Melville, Program Support	501-244-9523	ambika.melville@icfi.com	- Program Enrollment. - Online Reporting System.
Traci Synatschk, Program and Marketing Support	512-553-3766	traci.synatschk@icfi.com	- Program Enrollment. - Marketing Guidance.
Courtney Owen, Marketing Support	903-830-2126	courtney.owen@icfi.com	- Marketing Guidance and Materials. - ENERGY STAR® Logo Use. - Website Assistance.

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AN ENTERGY ARKANSAS PROGRAM

Entergy Arkansas New Homes Program

Approved Rating Companies: Contact Information

Company	Contact	Telephone	Email
HERS, Inc.	Ron Hughes	501-353-0605	ron@hersinc.com
Property & Environmental Inspections	Darryl McCauley	501-352-5017	darryl@peinspections.com
Viridian	Andrea Ingalsbe	501-227-0648	andrea@viridianusa.com

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Entergy Arkansas New Homes Program

Useful Web Links

The websites listed below will provide you with more information about Entergy Arkansas, ENERGY STAR® and energy-efficient residential construction.

Website	Description
entergyarkansas.com	Entergy Arkansas Website
newhomesEAI.programprocessing.com	Online Data Entry Tool
energystar.gov	ENERGY STAR Website
energystar.gov/publications	ENERGY STAR Publications – order FREE marketing materials here
energystar.gov/homes	ENERGY STAR Homes Website
natresnet.org	RESNET – Residential Energy Services Network
usgbc.org	United States Green Building Council

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AN ENTERGY ARKANSAS PROGRAM

Entergy Arkansas New Homes Program

Marketing Materials Information

The following companies can assist you with obtaining ENERGY STAR® branded materials.

Item	Company	Contact	Email	Phone
ENERGY STAR Homes Brochures	EPA	energystar.gov/publications	N/A	N/A
ENERGY STAR Signs	BuildASign.com	Tom Buchele-Wenner	Tom.buchele-wenner@buildasign.com	512-685-6836
ENERGY STAR Flags	Quality Flags	Erik Zylman	ezylman@qualityflags.com	847-672-2662
ENERGY STAR Shirts, Giveaway Items, etc.	4Imprint.com	Judy McDonald	jmcdonald@4imprint.com	877-446-7746 Extension: 8395

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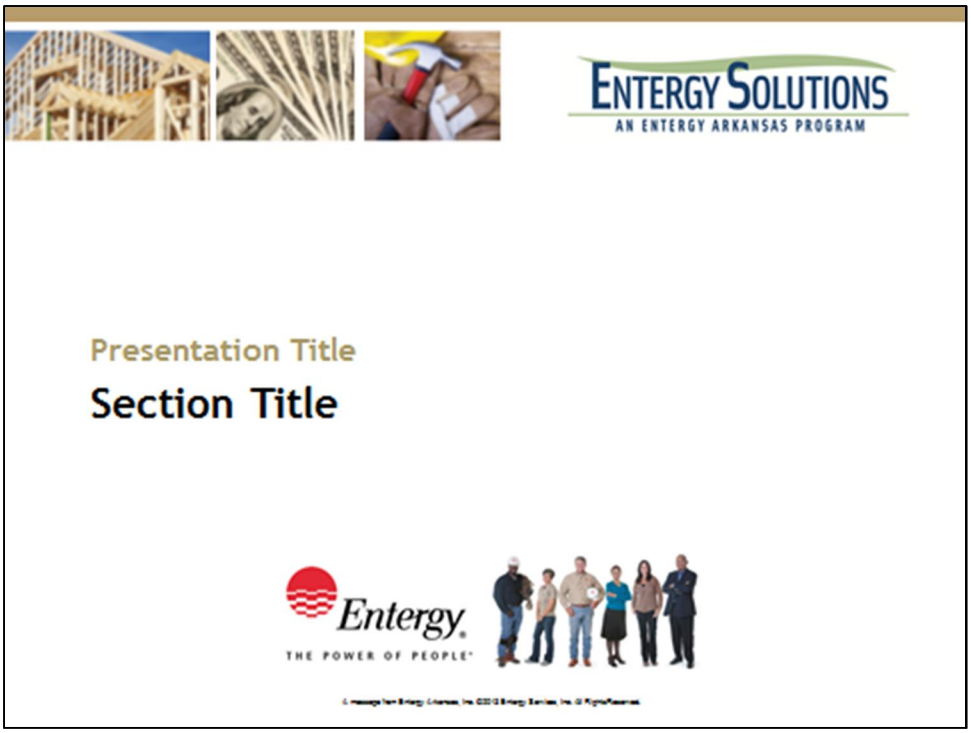
New Homes Power Point Template, Slide 1

New Homes Power Point Template, Slide 2



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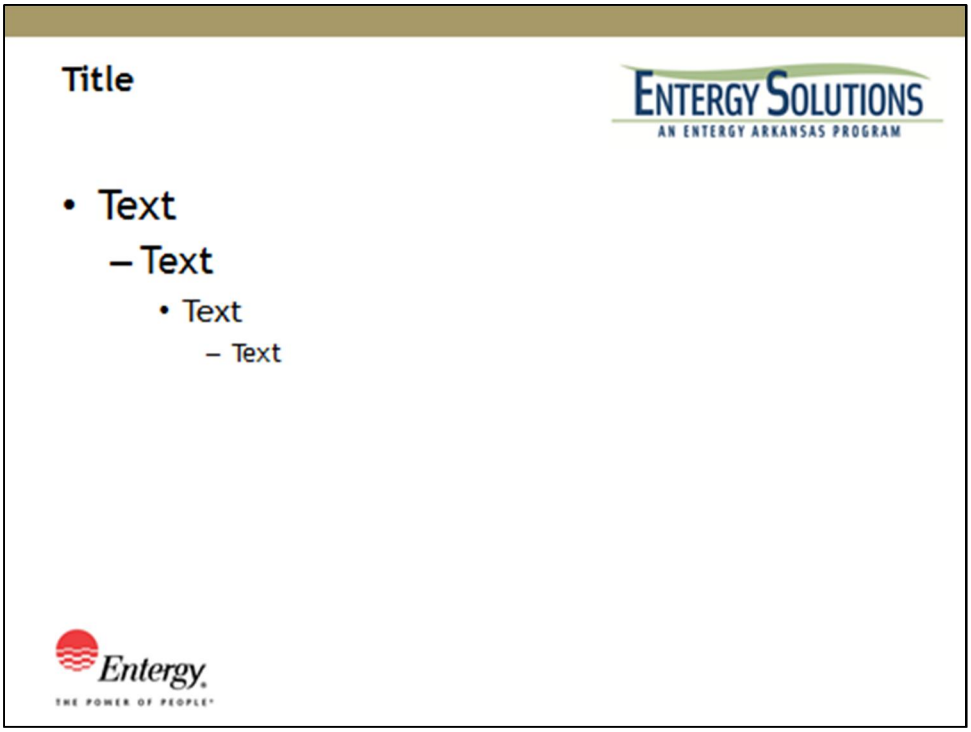
New Homes Power Point Template, Slide 3



New Homes Homebuilder Application

2013 Entergy Arkansas New Homes Program: Homebuilder Application

The 2013 Entergy Arkansas New Homes Program will award a limited number of financial incentives to homebuilders who complete and submit certification of the construction of new High Performance and/or ENERGY STAR® certified homes in the Entergy Arkansas service area. Homebuilders of all production volumes are encouraged to apply. In addition to financial incentives, homebuilders accepted into the program will have access to various training and marketing resources.

Homebuilder Application	
Organization Name *	Organization Main Contact *
Main Contact Email *	Main Contact Phone *

How many 2013 eligible homes does your organization plan on submitting for the following incentive amounts? *

Tier 1: Special Rate | Tier 2: High Performance Home | Tier 3: ENERGY STAR

What types of marketing does your organization currently use? *

Website	Magazine Ads	Email Marketing (e.g. Constant Contact)
Radio Commercials	Twitter	Other
TV Commercials	Facebook	None
Newspaper Ads	Seminars/Consumer Meetings	

If you checked "Other" please explain.

With which HERS Rater(s) are you currently working? *

HERS, Inc. | Viridian | Property and Environmental Inspections | Other

Please note: An applicant considered a "Free Rider" will be disqualified from program participation. A "Free-Rider" is someone who would install an energy efficiency measure without any program incentives or intervention.

* Required

To submit your application, please fax this form to 501-325-0443.

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NB-05-13

New Homes Questline 1

Entergy Solutions programs provide incentives to help you make your home more energy efficient.

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BUILD ENERGY EFFICIENCY INTO EVERY HOME.

The Entergy Arkansas New Homes program provides financial incentives of up to $1,000 to homebuilders who build energy-efficient homes.

Find out more

Do you build homes in the Entergy Arkansas service area? Did you know that you can get up to $1,000 in financial incentives per home – plus technical and marketing support – for homes you build during 2013? Follow the steps listed below to get started today!

- Complete a 2013 Program Application.
- If you plan to build ENERGY STAR® certified homes, complete the ENERGY STAR Online Partnership Agreement.
- Select a RESNET-accredited HERS Rater, and work with the Rater to identify the energy efficiency measures needed for your homes to meet incentive eligibility requirements.
- Submit your homes' information and supporting documentation through the program's online system.

The following incentive levels are available to participating homebuilders during 2013:

Tier 1: $300 for each Special Rate home.

Tier 2: $600 for each High Performance Home.

Tier 3: $1,000 for each ENERGY STAR certified home.

Contact us to learn more about the requirements for each tier.

Find out more

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New Homes Questline 2

Entergy Solutions programs provide incentives to help you make your home more energy efficient.

ENTERGY SOLUTIONS
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BUILD ENERGY EFFICIENCY INTO EVERY HOME.

Join us at an upcoming event to learn about financial incentives of up to $1,000 per home for homebuilders who build energy-efficient homes.

Find out more

Do you build homes in the Entergy Arkansas service area? Did you know that you can get up to $1,000 in financial incentives per home—plus technical and marketing support—for homes you build during 2013?

Meeting Details

HERS, Inc.
June 13, 2013
9:30–11:00 a.m.
1206 South Main St.
Little Rock, AR 72202

HomeEnergyRx
June 14, 2013
9:30–11:00 a.m.
100 Gamble Road
Little Rock, AR 72211

We will provide a program information packet and refreshments at all meetings. Please RSVP by contacting **Ambika Melville** at **501-244-9523** or **entergysolutions@icfi.com**.

The following incentive levels are available to participating homebuilders during 2013:

Tier 1: $300 for each Special Rate home.

Tier 2: $600 for each High Performance Home.

Tier 3: $1,000 for each ENERGY STAR® certified home.

Contact us to learn more about the requirements for each tier.

Find out more

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New Homes Banner Stand

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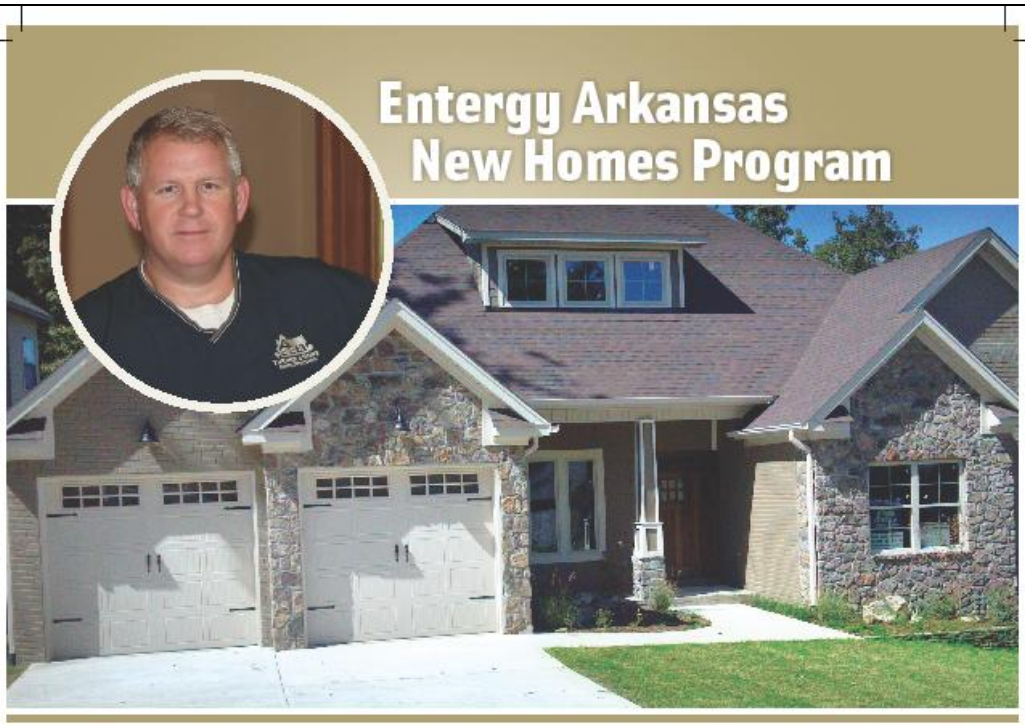
New Homes Case Study: Turner and Sons Construction



HOMEBUILDER SPOTLIGHT

Turner and Sons Construction

John Turner, owner of Turner and Sons Construction in Little Rock, has the distinction of building the first Certified Green home in the state. The 3,000-square-foot home is located in what is now Little Rock's only Certified Green Neighborhood.

John became a Certified Green Professional through the National Association of Home Builders and constructed the green home according to the NAHB Green Built Standard. But that was just the beginning of John's commitment to helping homeowners build in energy efficiency from the ground up.

Turner and Sons Construction participates in the Entergy Arkansas New Homes Program, which offers financial incentives up to $1,000 to home builders who submit qualified new homes built in the Entergy Arkansas service area. Through the New Homes Program, builders also receive technical training, sales and marketing materials, and ongoing support from a program account manager—all designed to help them build energy-efficient homes and build their businesses.

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"Entergy Arkansas makes it easy to get the home qualified for the program. And the rebates help offset some of the construction costs."

John Turner
Turner and Sons Construction

New Homes Case Study: Turner and Sons Construction, Reverse

Opportunity to Grow

John promotes the New Homes Program and the benefits of energy-efficient construction with every existing or potential client. He is confident that his participation in the program will continue to enhance the Turner reputation for building quality homes and result in more new construction projects.

John advises other builders, "Take the New Homes Program training classes and get started. You'll get the knowledge and skills you need to jump right into a project and you'll keep learning by doing."

How to Participate

All interested homebuilders must complete and submit an application for the program. Entergy Arkansas will review all applications, and selected homebuilders will be notified in writing of the number of homes eligible for incentives. Homebuilders may choose to accept or decline the incentive award offer.

In addition to the Entergy Arkansas program application, all participating homebuilders interested in constructing ENERGY STAR® certified homes are required to fill out an Online Partnership Agreement with the National ENERGY STAR New Homes Program. The agreement is located online at: energystar.gov/homesPA.

Incentives for Builders

Tier 1: $300 for each Special Rate home

Tier 2: $600 for each High Performance home

Tier 3: $1,000 for each ENERGY STAR certified home

Learn more about the Entergy Arkansas New Homes Program at entergyarkansas.com.
Or call 866-627-9177 or email entergysolutions@icfi.com.

HOMEBUILDER PROFILE

Turner and Sons Construction
www.turnerandsonsconstruction.com

Location: Little Rock

Established: 2005

Certifications:
National Association of Homebuilders
Certified Green Professional

"Through this program, I was able to build the best home I could and make it better for my clients."

John Turner
Turner and Sons Construction

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2.12 Multifamily Homes

MF Program Manual

Entergy Arkansas, Inc.

2013 Multifamily Program Manual

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Prepared by:

CF International
Little Rock, AR

Contact:

866-627-9177
MultifamilyEA@icfi.com
entergyarkansas.com

Version 1.0
Revised July 8, 2013

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Entergy Arkansas 2013 Multifamily Program Manual

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MF Program Manual, page 3

Program Overview

Program Description

The EAI Multifamily Program provides cost-effective energy efficiency measures to the multifamily residential market throughout the EAI, Inc. (EAI) electric service territory. Through the program, ICF technicians will install energy efficiency measures in dwelling units of participating customers at no cost. The program will also provide energy surveys to owners of multifamily properties, helping those owners to learn about other energy saving opportunities and programs.

Program Objectives

The program's objectives are to help multifamily property owners, managers, and tenants reduce energy usage at the property and the dwelling units, as well as learn more about their energy consumption.

Program Participation

STEP 1: Enroll in the program by calling an account manager at 866-627-9177 or by emailing an enrollment form* to **MultifamilyEAI@icfi.com**.

STEP 2: Schedule an appointment to have the direct installation team perform the installations.

STEP 3: Answer energy survey questions to the best of your ability.

*The enrollment form is a one-page document that all participants must complete. This form collects information required to confirm eligibility for the program, and also helps determine which energy efficiency measures are appropriate for the property.

STEP 4: Send notices to all tenants about the upcoming installations.

STEP 5: Schedule a property management representative to accompany the direct installation team while they are on the property for access to the units.

STEP 5: Schedule an appointment to the Direct Installation Team leader perform an energy survey of the common property and a quality control verification of work performed in a sampling of the units. A property management representative should plan to be present for the duration of the energy survey.

Program Eligibility

- Multifamily properties composed of five or more units located within the EAI electric service territory are eligible for the EAI Multifamily Program. Properties under a residential, multifamily or commercial rate code all qualify for this program.
- There are no maximum limits on the size of a building or number of qualifying buildings in a single complex.
- Funds are limited and services are available in select geographic areas on a first-come, first-served basis.
- Building with fewer than four units, condominiums, and owner occupied buildings, regardless of the number of contiguous units per building, may qualify for a different EAI residential energy efficiency program. For

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information about such programs, please visit entergyarkansas.com.

Program Benefits

Direct Install Measures

In this program, energy-efficient products are furnished and installed at no cost to EAI multifamily customers. The installed measures help reduce energy usage, water consumption, and sewer charges. The measures available for direct installation in eligible properties and locations are as follows:

- ENERGY STAR CFLs (13 watt, 18 watt and 23 watt) in fixtures and lamps that replace incandescent bulbs (limited to ten CFLs per unit).
- 1.5 gallons per minute showerheads and faucet aerators (when existing fixtures have flow rates of 2.0 gallons per minute or greater and where the water heater is powered by electricity).

Energy Survey Services

Included with the site visit is a complementary energy survey of the property and applicable equipment. Property owners/managers will receive a summary report of the property's potential energy savings as well as information about other EAI programs for which they may be eligible.

Program Quality Management

Post Inspection

Completed projects will be subjected to a post-installation inspection, selected on a random basis. Typically, it will consist of 10 percent of the properties. If it is determined that a post-inspection is going to be performed, a Program Representative will contact the customer to ask about the installation and visit the project site.

Terms and Conditions

- **MULTIFAMILY PROGRAM:** The EAI, Inc. (EAI) Multifamily Program service includes the installation of energy-saving measures at the time of the site visit by an EAI authorized contractor. Property owners that participate in the program will receive a summary report from the authorized contractor via mail/email.
- **SUMMARY REPORT:** The Multifamily Program summary will provide the customer with a compiled review of energy-saving measures installed throughout the property, and recommendations related to energy efficiency programs available. EAI will not be responsible for lost documentation pertaining to the delivery.
- **ELIGIBILITY:** Funds are limited and services are available in select geographic areas on a first-come, first-served basis. Participants must be EAI electric utility customers. For other EAI programs, please visit entergyarkansas.com.
- **APPROVAL AND VERIFICATION:** EAI reserves the right to verify the delivery of services and to have reasonable access to the participant's residence to inspect the energy efficiency measures installed under this program.
- **TAX LIABILITY:** The customer is responsible for declaring and paying any and all applicable federal, state, and local taxes that may be owed on any incentive. EAI will not be responsible for any tax liability that may be imposed on the customer as a result of the delivery of direct installation measures. Please contact your tax professional for more information.

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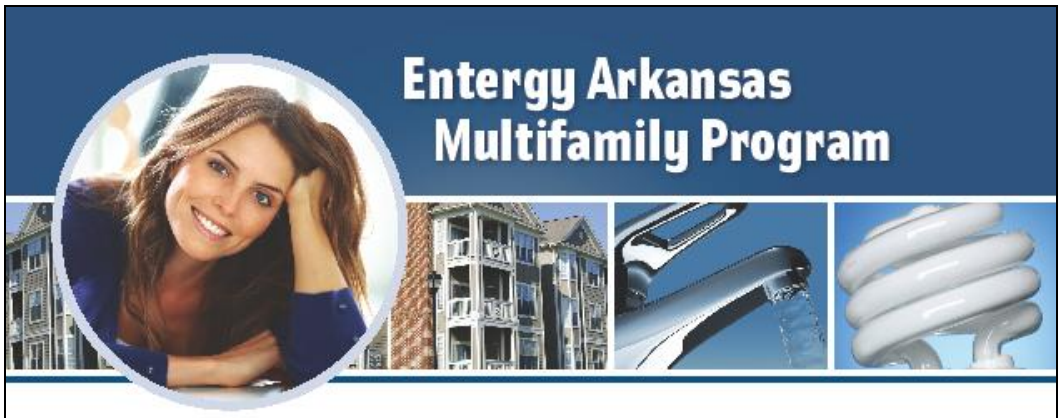
- **ENDORSEMENT:** EAI does not endorse any particular manufacturer, product, system design, or service in promoting this program.
- **INFORMATION RELEASE:** Participant agrees that EAI may include participant's name, EAI services, and resulting energy savings in reports or other documentation submitted to the program implementer on EAI' behalf and/or the Arkansas Public Service Commission.`
- **NO WARRANTIES:** EAI DOES NOT WARRANT THE PROPER COMPLETION OF WORK OR PERFORMANCE OF INSTALLED PRODUCTS, EXPRESSLY OR IMPLICITLY. EAI does not endorse, guarantee, or warrant any particular manufacturer or product and EAI provides no warranties, expressed or implied, for any products or services. EAI makes no warranties of any kind, whether statutory, expressed, or implied, including without limitations, warranties of merchantability or fitness for a particular purpose regarding CFLs, efficient-flow showerheads, or faucet aerators. EAI makes no guarantee of energy-saving results by receiving measure installation. The customer acknowledges that neither EAI nor any of its consultants are responsible for assuring the design, engineering or installation of the measures is proper or complies with any particular laws (including patent laws), codes or industry standards.
- **PROPERTY RIGHTS:** Participant represents that s/he has the right to complete and/or install the energy-saving measures on the property on which those measures are completed and/or installed, and that any necessary landlord's or tenant's consent, as the case may be, has been obtained.
- **RENTER'S CERTIFICATION:** Renter certifies that s/he has received consent from the landlord or homeowner for receipt of the energy survey and associated direct installation of measures.
- **RIGHT TO REFUSE:** The direct installation team has the right to refuse service or end the delivery when confronted by a customer acting inappropriately or when facing an unsafe situation. "Inappropriate" includes but is not limited to the following: unreasonable demands for service, personally threatening or offensive language, threatening or erratic behavior, and personal contact. Authorized contractor reserves the right to exclude any premises, or vicinity therein, deemed potentially unsafe or harmful.
- **USE OF EMAIL ADDRESS:** EAI or program implementer may contact participants via email or fax in connection with the Multifamily Program.
- **AUTHORIZATION, PROGRAM CHANGES, SUSPENSION OR CANCELLATION:** EAI may change the program requirements, incentives, or terms and conditions, including suspending acceptance of applications or terminating the program, at any time without notice.
- **MISCELLANEOUS:** These terms and conditions constitute the agreement between the parties and supersede all other communications and representations. By executing an Enrollment Form, the customer agrees to be bound by these Terms and Conditions.

Disclaimer

Neither EAI nor ICF makes any guarantee or any other representation or warranty, expressed or implied, as to the quality or effectiveness of any product(s) provided or work(s) performed through this program.

Energy efficiency gains are subject to a number of variable conditions and circumstances. While it is the intent of the Program to achieve energy efficiencies, neither EAI nor ICF International guarantees or warrants that any specific energy efficiency gains will be achieved for a particular customer participating in the program.

MF Overview



Save Energy. Save Money.

The Entergy Arkansas Multifamily Program can benefit both multifamily property owners and their tenants. The energy efficiency upgrades described below will add value to your property and help lower your water and sewer costs while also providing your tenants with decreased energy costs.

Free energy-saving products will be installed in each unit of your eligible* multifamily property by a team of Entergy Arkansas field technicians.

Compact Fluorescent Light Bulbs

CFLs will be installed in fixtures or table lamps in each unit.

- CFLs last up to 10 times longer than traditional incandescent bulbs.
- CFLs use up to 75 percent less energy than traditional bulbs.

Energy-Efficient Showerheads

Eligible showerheads will be replaced with new, energy-efficient showerheads.

- The showerheads are corrosion-resistant, self-cleaning and maintenance-free.
- The 1.5 gallons-per-minute showerhead uses 40 percent** less water compared to a standard showerhead, meaning less energy is used to heat water for showers.

Kitchen and Bathroom Faucet Aerators

Energy-efficient, 1.5 gallons-per-minute faucet aerators will be installed in the kitchen and bathroom.

- The aerators are made of long-lasting materials.
- They use 31 percent** less water compared to a standard faucet, meaning less energy is used for water heating.

Pipe Insulation

Pipes connected to your water heater will be insulated.

- This measure may help reduce the time it takes for hot water to reach your tap and will reduce the costs associated with heating water.

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Energy Survey

The Entergy Arkansas field technicians also will perform an energy survey of your property's common areas at no cost. This survey will identify opportunities for future energy-efficient improvements to the building systems (i.e., heating, cooling and lighting), and you will be provided with a summary report with recommendations.

Learn more about the Entergy Arkansas Multifamily Program by visiting us online at **entergyarkansas.com**, calling us at **866-627-9177** or by email at **entergysolutions@icfi.com**.

*Water efficiency products are only available to those customers who have an electric water heater.

**Savings are approximate and will vary with efficiency of heating and water heating system, temperature of incoming and outgoing water and number of occupants in the home.

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MF Overview, Spanish

Programa de Multifamiliares de Entergy Arkansas

Ahorre Energía. Ahorre Dinero.

The El Programa de Multifamiliares de Entergy Arkansas puede beneficiar a los dueños de la propiedad y a los arrendatarios. Las mejoras de eficiencia en el uso de la energía que se describen abajo le agregaran valor a la propiedad y ayudara a reducir su gasto de agua y servicios de aguas residuales mientras proporciona a sus arrendatarios costos bajos en el uso de energía.

Productos gratis que ahorran energía se instalaran en cada unidad de su propiedad de multifamiliares que sean elegibles* por un equipo de técnicos en el campo de Entergy Arkansas.

Bombillas de Luces Compactas Fluorescentes

Las bombillas de luz compacta fluorescente se instalaran en elementos de la instalación o en lámparas de mesa en cada unidad.

- Las bombillas de luz compacta fluorescente duran hasta 10 veces más que las bombillas incandescentes tradicionales.
- Las bombillas de luz compacta fluorescente utilizan hasta 75 por ciento menos energía que las bombillas tradicionales.

Regaderas Eficientes en el uso de la Energía

Las regaderas elegibles serán remplazadas con regaderas eficientes en uso de energía nuevas.

- Las regaderas son resistentes a la corrosión, se limpian solas y se mantienen gratise.
- La regadera de 1.5 galones por minuto utilizan 40 por ciento** menos comparado a una regadera estándar, significa que menos energía es utilizada para calentar agua para las duchas.

Aerificadores en los Grifos de Cocina y Baño

Aerificadores eficientes en el uso de la energía se instalaran en los grifos de cocina y baño.

- Los aerificadores están hechos de materiales durables.
- Utilizan 31 por ciento** menos agua comparado a un grifo estándar, significa que utilizan menos energía para calentar agua.

Tubería Aislada

La tubería conectada al calentador de agua debe estar aislada.

- La medida ayudara a reducir el tiempo que toma para que el agua caliente llegue a su llave y esto reducirá el gasto asociado con calentar agua.

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Encuesta de Energía

Los técnicos en el campo de Entergy Arkansas también realizaran una encuesta de energía de las áreas comunes de su propiedad a ningún costo. La encuesta identificara oportunidades para las mejoras futuras de eficiencia en el uso de la energía a los sistemas del edificio (por ejemplo, calefacción, aire acondicionado e iluminación), y a usted se le proporcionara un resumen con recomendaciones.

Aprenda mas acerca del Programa de Multifamiliares de Entergy Arkansas al visitarnos en línea en **entergyarkansas.com**, o llámenos al **866-627-9177** o vía correo electrónico a **entergysolutions@icfi.com.**

*Productos de agua eficiencia solo están disponibles para los clientes que tienen un calentador de agua eléctrico.

**Los ahorros son aproximados y varían con la eficiencia de calefacción y del sistema de calentador de agua, temperatura del agua entrante and que sale y el numero de ocupantes en la casa.

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MF Tune-Up Program Terms & Conditions

ENTERGY SOLUTIONS

Tune-Up Program Terms and Conditions

These terms and conditions are only valid for installation or service completed on or after Sept. 1, 2013. Only participating Contractors may submit applications for rebate consideration.

Customer Information		
Property Name	Email Address	
Street Address and Unit #	Phone	
City and County	State	Zip
Entergy Arkansas Account Number		
Company Name and Service Technician		

APPLICATION: The application and any required additional documentation, including the invoice, permit information and equipment tune-up reports must be filled out completely, accurately and must be submitted by the Contractor. Customers are advised to obtain and retain a copy of the application from the Contractor and any accompanying documentation submitted to Entergy Arkansas, Inc. under this program. Entergy Arkansas will not be responsible for lost documentation pertaining to an application request. This program covers tune-ups performed on or after Sept. 1, 2013. Details of this program, including incentive levels, are subject to change or cancellation without prior notice. The application, with required documentation, must be received within 30 days of the completion of the installation or service performed. Only one rebate is allowed for each tune-up performed. Funds for incentives are limited and available on a first-come, first-served basis. Incentive amounts are valid through Dec. 31, 2013, but can change without notice. Please call us toll free at 1.866.627.9177, email **entergysolutions@icfi.com** or visit **entergyarkansas.com** for the most up-to-date details.

ELIGIBILITY: This offer is valid for Entergy Arkansas multifamily electric customers applying through the Entergy Arkansas Multifamily AC Tune-Up Program only. In order to qualify for a rebate, the tune-up must be performed by an Entergy Arkansas participating Contractor. The application must be submitted by a participating Contractor for payment. Air conditioning units must be older than one year and have not had a similar comprehensive tune-up within the past five years. Participating Contractors are listed at **entergyarkansas.com**.

APPROVAL, VERIFICATION AND INSPECTION: Prior to any payment of incentives, Entergy Arkansas reserves the right to verify sales transactions. Customer's Contractor will verify that the installed energy-saving measures meet all applicable building codes; zoning laws; local, state and federal requirements; and other relevant requirements. Contractor is responsible for any applicable permits as required by law. Outdoor temperatures and other weather conditions may affect this verification process. The Multifamily property may also be selected for a quality control post-installation inspection by Entergy Arkansas or its Contractor. No warranty is expressed or implied by this inspection.

REQUIRED DOCUMENTATION: A Contractor's invoice itemizing the tune-up service performed must accompany each Entergy Arkansas Multifamily Tune-Up Program incentive request. The invoice copy must indicate the property name, address, unit number and date of service performed. Multiple units at the same property can be itemized on one invoice. Applications for tune-up services must have all sections of the rebate application and Terms and Conditions properly completed, along with the Contractor's invoice.

PAYMENT: Please allow up to eight weeks for processing. Payment processing may be delayed if required documentation or information on the application or on the Contractor's invoice is missing.

Please call us toll free at 1.866.627.9177 or email **entergysolutions@icfi.com** if you have questions about your incentive.

TAX LIABILITY: Entergy Arkansas will not be responsible for any tax liability that may be imposed on the customer as a result of the payment of incentives. Please contact your tax advisor for more information.

NO ENDORSEMENT: Entergy Arkansas does not endorse any particular manufacturer, product, system design, claim or Contractor in promoting this program.

INFORMATION RELEASE: Customer agrees that Entergy Arkansas may include customer's name, address, Entergy Arkansas account number, Entergy Arkansas services and resulting energy savings in a Entergy Arkansas authorized database and such information may be included in reports or other documentation submitted to Entergy Arkansas and/or the Arkansas Public Service Commission. Entergy Arkansas will treat such information as confidential and the information in the reports shall only be in the aggregate.

LIMITATION OF LIABILITY: ENTERGY ARKANSAS' LIABILITY IS LIMITED TO PAYING THE INCENTIVE SPECIFIED. IN NO EVENT WILL ENTERGY ARKANSAS BE LIABLE WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, WARRANTY OR OTHERWISE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES CONNECTED WITH OR RESULTING FROM PARTICIPATION IN THIS PROGRAM. ENTERGY ARKANSAS RESERVES THE RIGHT TO NOT PAY THIS INCENTIVE IF THE APPLICATION FORM AND ALL REQUIRED ADDITIONAL INFORMATION ARE NOT COMPLETE AND ACCURATE.

WARRANTIES: ENTERGY ARKANSAS DOES NOT WARRANT THE PERFORMANCE OF INSTALLED OR SERVICED EQUIPMENT, EXPRESSLY OR IMPLICITLY. ENTERGY ARKANSAS MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING THE CENTRAL AIR CONDITIONING PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR CONTRACTOR FOR DETAILS REGARDING EQUIPMENT PERFORMANCE AND WARRANTIES.

PROPERTY RIGHTS: Property Manager/Owner represents that he/she has the right to authorize the energy-saving measures on the property on which those measures are completed and/or installed and that any necessary landlord's consent has been obtained.

CUSTOMER'S CERTIFICATION: Property Manager/Owner certifies that he/she has contracted for the received service listed on the application at the defined location. Property Manager/Owner agrees that all information is true and that he/she has conformed to all program and equipment requirements listed.

Signatures (required)

Entergy Arkansas Multifamily Air Conditioner Tune-Up Program incentive requests cannot be processed unless all of the appropriate fields on the front side of this application are complete. Please be sure you have read the terms and conditions of this application.

I HAVE READ AND UNDERSTAND THE TERMS AND CONDITIONS ABOVE. I CERTIFY THAT THE INFORMATION I HAVE PROVIDED IS TRUE AND CORRECT.

Property Manager/Owner Signature or Last Four Digits of Social Security Number of Account Holder — *Date*

Contractor Signature — *Date*

Incomplete applications will not be accepted for payment. Your participating Contractor must provide all supporting documentation. This includes a completed and signed copy of this form, along with a copy of the Contractor's invoice, including installation date, equipment type, make, model and serial numbers. For tune-up services, this form, along with the Contractor's invoice and a copy of a completed central air conditioner report, must be provided. All supporting documentation will be submitted by the participating Contractor via the online application system.

MF Tune-Up Program A/C Rebate Application

Entergy Arkansas Multifamily AC Tune-Up Rebate Application

Company _____ Test date _____

Property Name _____ Contact Number _____

❑ Gas Furnace or ❑ Air Handler
Blower Tonnage _____
❑ Condensing Unit or ❑ Heat Pump
EER (if known) _____
Indoor Coil (tons and ref. control only if in air handler)
_____

Manufacturer _____ Rated TESP _____
Model # _____ S/N _____
Manufacturer _____ Tons _____
Model # _____ S/N _____
Manufacturer _____ Tons _____
Model # _____ ❑ TXV ❑ Fixed

Test Results	Before		After		Comments
Fan Airflow (measured/verified)	0		0		Ideally this system should have _____ CFM
System Watts					Watts = measured Volts x measured Amps
Coil Entering DB/WB	DB	WB	DB	WB	Coil entering conditions
Coil Leaving DB/WB	DB	WB	DB	WB	Coil leaving conditions
Coil Capacity	BTUH		BTUH		BTU = CFM x 4.5 x Δ enthalpy
÷ Equipment Nominal BTU	BTUH		BTUH		Manufacturer's rated nominal cooling BTUH
= System Effective Efficiency	%		%		Should exceed 85% of nominal capacity

Charge Data ('After' only)

Outdoor Air _____ °F Suct. Press. _____ psi Suct. Temp. _____ °F Liquid Press. _____ psi Liquid Temp. _____ °F
Name Plate Charge _____ lbs. _____ oz. Liquid Line Size: Length _____ Diameter _____

Calculation Worksheet (Before/After)

System Watts (Power):
Blower Motor Volts _____/_____ x Amps _____/_____ = _____/_____ Watts
Outdoor Unit Volts _____/_____ x Amps _____/_____ = _____/_____ Watts
Add watts above to get total _____/_____ Total

Converting Wet Bulb to Enthalpy (measure all temps. To first decimal place and record Enthalpy to two decimal places)
Coil Entering WB _____ °F _____ °F = _____/_____ BTU/Lb Enthalpy a
Coil Leaving WB _____ °F _____ °F = _____/_____ BTU/Lb Enthalpy b
Coil Capacity Before: CFM _____ x 4.5 x (Enthalpy a - b _____) = _____ BTUH
Coil Capacity After : CFM _____ x 4.5 x (Enthalpy a - b _____) = _____ BTUH

System Effective Efficiency Before: Coil Capacity _____ ÷ _____ Equip. Nom. Cap. = _____ %
System Effective Efficiency After : Coil Capacity _____ ÷ _____ Equip. Nom. Cap. = _____ %

Minimum Tune-Up Procedures and Notes

❑ Changed or Cleaned Air Filter _____
❑ Inspect/Clean Condenser, Evaporator Coil and Blower _____
❑ Tighten Electrical Connections, Lubricate Moving Parts _____
❑ Adjusted Refrigerant Charge to OEM Specs. ❑ added / ❑ recovered _____ lbs. _____ oz.
❑ Measure Voltage and Amperage of Blower and Outdoor Unit _____
❑ Check Controls and Sequence of Operation _____
❑ Calibrate/ Program Thermostat _____

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MF-09-13

MF Briarwood Press Release

FOR IMMEDIATE RELEASE

Entergy Arkansas Offers Energy-Saving Upgrades to Briarwood Apartments

Searcy, AR (DATE)- Through its suite of Entergy Solutions energy efficiency programs, Entergy Arkansas is helping its residential and commercial customers save energy and money. Residents and management at Briarwood Apartments in Searcy recently received free energy-saving upgrades through the utility's Entergy Solutions Multifamily Program.

As a part of the Searcy Regional Chamber of Commerce Energy Smart Campaign, Entergy Arkansas field technicians installed energy-saving measures throughout Briarwood Apartments, providing residents opportunities to save on monthly energy costs through decreased lighting and water heating costs, and providing management valuable information about how to improve the overall energy use at the property. Measures installed in individual units included:

- CFL's that use up to 75 percent less energy and last up to 10 times longer than traditional bulbs.
- Energy-efficient showerheads that are maintenance-free and use up to 40 percent less water than standard showerheads.
- Kitchen and bathroom faucet aerators that are made of long lasting materials and use 31 percent less water compared to standard faucets.

If you're interested in learning more about the Entergy Arkansas Multifamily Program or other Entergy Solutions programs, please visit us online at entergyarkansas.com. For more information about the Searcy Arkansas Energy Smart campaign, visit searcychamber.com

Entergy Arkansas provides electricity to approximately 700,000 customers in 63 counties. Entergy Arkansas is a subsidiary of Entergy Corporation, an integrated energy company engaged primarily in electric power production and retail distribution operations. Entergy Corporation's utilities own and operate power plants with approximately 30,000 megawatts of electric generating capacity. The Entergy utilities deliver electricity to 2.8 million utility customers in Arkansas, Louisiana, Mississippi and Texas. Entergy Corporation has annual revenues of more than $11 billion and approximately 15,000 employees.

Website: entergyarkansas.com Twitter: @EntergyARK Facebook: Facebook.com/EntergyARK

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MF Rebate Reservation

ENTERGY SOLUTIONS

Multifamily Rebate Reservation

Rebate Reservation Process

1. When the Entergy Arkansas Multifamily Efficiency Rebate program funds become low, a rebate reservation number will be required to assure funds are available.
2. Contractor submits the rebate reservation form to reserve a rebate for an energy efficiency improvement at the location listed below.
3. ICF will review the rebate reservation form and validate the Entergy Arkansas account number provided.
4. ICF will email contractor a rebate reservation number that is valid for work performed within 15 days of authorization.
5. Contractor completes and submits rebate application.
6. Contractor receives a rebate check for completed qualifying projects.

Property Manager Contact Information

Property Name	Contact	
Address		
City	State	Zip
Entergy Arkansas Account Number		
Primary Phone	Cell Phone	
Email Address		

Multifamily Residential Energy Efficiency Program

Select one or both: ❑ Insulation to R-38 ❑ Multifamily AC Tune-up

Number of rebates	Square footage of insulation:
Rebate Amount Reserved:	$ Up to $2,500 may be reserved. The final rebate amount may exceed the reservation amount if funds are available.

Contractor Information

Company	Contact	Phone
Address	Email	

Terms and Conditions

Submission of this rebate reservation form is subject to the following terms and conditions:

1. Entergy Arkansas has a limited budget and participation is on a first-come, first-served basis.
2. A rebate may be reserved up to a maximum of 15 days for individual measures. You will receive a confirmation that the rebate has been reserved, including the expiration date.
3. Rebates are paid only for multifamily property customers with a valid Entergy Arkansas Account and ICF/Entergy Arkansas reserves the right to have an inspection conducted at the project location to verify installation.
4. Rebates are paid for the completion of eligible energy efficiency upgrades and services performed by a participating contractor. Rebate amount paid is based on the actual products correctly installed and/or services properly performed.

Fax completed form to 866.627.9188 or email to entergysolutions@icfi.com

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MF-08-13

MF Banner Stand

MF Leave Behind Card

MF Leave Behind Card, Spanish

MF Contractor Participation Agreement

ENTERGY SOLUTIONS

Contractor Participation Agreement

2013/2014 Entergy Arkansas Multifamily Air Conditioning Tune-Up Market Transformation Program

This contractor agreement for participation in the 2013-14 Entergy Arkansas Air Conditioning Tune-Up Program is made by and between _____ contractor and ICF Resources, L.L.C. ICF is the program administrator of Entergy Arkansas' Multifamily Air Conditioning Tune-Up Program. "Contractor" shall mean the company and persons responsible for performing the work contained herein. "Air Conditioning System Performance Improvement" shall mean the performance of the program's tune-up service on an existing, in-service air conditioning system that meets the Eligibility Requirements as defined in this agreement.

2. **Participation Award.** For each qualifying AC System Performance Improvement Report submitted, the program hereby agrees to pay a $175 incentive payment to the contractor. The total maximum number of tune-ups that the contractor is eligible to receive the $175 incentive payment for under this agreement is on a first-come first-served basis until program incentive funds are exhausted.
3. **Contractor Participation Requirements.** Contractor must meet the following requirements to maintain active status as a participant in the program:
   i. **Licensing and Insurance Requirements.** Contractor must be currently licensed with the Arkansas Department of Health and must carry the appropriate amount of insurance for the classification of the license held. Contractor agrees to provide a copy of their license and insurance certificate with this agreement.
   ii. **Initial Completion of Program Training.** Contractor, or an appropriate employee of contractor, must successfully complete the program's technical training course. Training must be successfully completed within the earlier of 90 days from the date of this agreement or the date of the next available class.
   iii. **Contractor Reporting Requirements.** On each Air Conditioning System Performance Worksheet submitted, contractor agrees to provide the program Administrator with completed pre-test and post-test results for all of the required performance data as listed on the Air Conditioning System Performance Worksheet.
   iv. **Marketing and Promotion of Tune-Up Service.** At a minimum, contractor must promote the availability tune-up service protocol on its company Web site, if such site exists. Other types of marketing and promotional initiatives are encouraged if deemed appropriate by the contractor.
4. **System Eligibility Requirements.** Each system tune-up must meet the following Eligibility Requirements in order to qualify for financial incentives:
   i. **Address within the Entergy Arkansas Service Territory.** The multifamily property address must be in the Entergy Arkansas service territory and be serviced by Entergy Arkansas. To verify eligibility, contractor will provide a valid Entergy Arkansas account number for the property upon which the unit is located. The address (including unit number) must be included for each AC System Performance Improvement Report submitted to the program.
   ii. **Equipment Eligibility.** Systems must be between 1.5 and 5 tons, installed on or before Oct. 1, 2012. The unit cannot have participated in an Entergy Arkansas air conditioner tune-up in the past five years.
   iii. **Eligible Submission Dates.** System tune-ups must be completed after Oct. 1, 2013. A completed Air Conditioning System Performance Worksheet and application for each system tune-up must be submitted within 15 days of the service performed date.

MF Contractor Participation Agreement, page 2

iv. **Documented Improvement in System Performance.** To qualify for the $175 incentive payment, each Air Conditioning System Performance Worksheet must include pre tune-up measurements, selected tune-up measures and post tune-up measurements. The post-tested system must achieve OEM design capacity. Contractor agrees that the decision regarding the eligibility of any submitted system for incentives is at the sole discretion of ICF and Entergy Arkansas and that this decision is final and not eligible for appeal in any court of law.

v. **ICF reserves the right to implement a rebate reservation process when the program funding is nearing exhaustion.** Contractors will be notified in writing and/or email at least two weeks prior to the reservation process being implemented. When implemented, contractor must have a rebate reservation number in order to guarantee payment.

5. **Entergy Arkansas' Right to Additional Audit and Reimbursement.** Contractor acknowledges the right of ICF and/or Entergy Arkansas to conduct a follow-up audit of any Air Conditioning System Performance Worksheet report that has been accepted for payment into the program. Contractor also acknowledges the right of ICF to invoice contractor and collect reimbursement for any incentive payments that were paid in error for any of the following reasons: (i) any address which is found not to be on Entergy Arkansas service; (ii) any address that is found to have already been paid financial incentives for the same measure by the program or from any other Entergy Arkansas program; or (iii) any system that fails the ICF and/or Entergy Arkansas follow-up audit process.

Performance Milestone Date Requirements. Since incentives are awarded on a first-come first-served basis until program funds are exhausted, you are encouraged to submit the qualifying Air Conditioning System Performance Worksheets as soon as possible after the service is complete. ICF has the option to withdraw some or all of the potential incentive.

6. **Term.** This agreement shall remain in effect until Dec. 31, 2014; provided, however, any payments due for documentation submitted prior to Dec. 15, 2014, shall still be due and owing. Contractor acknowledges that ICF reserves the right to terminate the agreement, or modify this agreement at any time, without prior notice, as may be required by governmental regulatory action; provided, however, if this agreement is modified contractor shall have the right to terminate the agreement if the modified agreement is unacceptable to contractor.

7. **Notices.** Addresses for notices:

Contractor

_____

_____

_____

_____

_____

ICF:

ICF Resources, LLC.

Attention: Terry Kessinger

425 West Capitol, Suite 3180

Little Rock, AR 72201

8. **Indemnity.**

CONTRACTOR WILL RELEASE, INDEMNIFY AND HOLD HARMLESS ENTERGY ARKANSAS FROM ANY AND ALL CLAIMS, DEMANDS, LOSSES, EXPENSES, DAMAGES, ATTORNEYS' FEES, JUDGMENTS, COSTS AND LEGAL LIABILITY ARISING FROM OR RELATED TO THE CONTRACTOR AGREEMENT, THE PROGRAM OR ANY SERVICES OR PRODUCTS PROVIDED THEREUNDER, REGARDLESS OF ANY STRICT LIABILITY OR NEGLIGENCE OF ENTERGY ARKANSAS, WHETHER ACTIVE OR PASSIVE, EXCEPTING ONLY SUCH CLAIMS AS MAY BE CAUSED BY THE GROSS NEGLIGENCE OR WILLFUL MISCONDUCT OF ENTERGY ARKANSAS.

9. **Other Terms and Conditions.**

A. Contractor will perform the work as an independent contractor and neither contractor nor its employees will act as or be deemed employees or agents of ICF or Entergy Arkansas. Contractor agrees to furnish all labor, materials, equipment, supervision and clean-up to perform the installation of energy efficiency measures. Contractor warrants that prior to beginning any work it will obtain, at its own cost and expense, all permits, licenses and other authorizations from governmental authorities as then may be required to perform the work and that it will maintain such authorizations throughout the term of this agreement, as necessary.

B. In the event of a dispute, each party agrees to have an authorized representative empowered to resolve the dispute meet for a period of not more than three (3) calendar days to resolve the dispute. Should the dispute resolution be unsuccessful, the matter may be submitted to any court of competent

MF Contractor Participation Agreement, page 3

jurisdiction or an alternative dispute resolution panel. No oral or written representation made during the course of any panel proceeding or other settlement negotiation shall constitute a party admission.

C. This agreement shall be governed by and construed in accordance with the substantive laws of Arkansas, without any reference to conflict-of-laws principles.

D. In no event shall ICF be liable for any indirect, incidental, special or consequential damages whatsoever (including but not limited to lost profits or interruption of business) arising out of or related to this agreement, even if advised of the possibility of such damages. In no event shall ICF's liability to contractor in connection with this agreement exceed the amount payable hereunder.

E. No language in the agreement shall be construed to make the parties legal business partners, joint ventures, representatives or agents of each other, nor shall either party so represent such to any third party.

F. **Additional Entergy Arkansas Terms.**

i. ICF represents, and contractor acknowledges, that ICF is an independent contractor with respect to Entergy Arkansas and the program, and that ICF is not authorized to make representations or incur obligations on behalf of Entergy Arkansas. contractor further acknowledges that Entergy Arkansas is not a party to this agreement and that ICF and contractor are solely responsible for performance hereunder. Contractor agrees that Entergy Arkansas is a third-party beneficiary of this agreement and, as such, may rely on the representations made herein by contractor and enforce contractor's obligations hereunder to the extent the same are applicable to Entergy Arkansas.

ii. Contractor agrees upon three (3) calendar days' prior verbal notice, to provide Entergy Arkansas, ICF and any independent measurement and verification person selected by the Arkansas Public Service Commission with full and complete access to any program property for any purpose related to the program. **Access shall be in compliance with the contractor's reasonable access requirements.**

iii. **ANY REVIEW, INSPECTION OR ACCEPTANCE BY ENTERGY ARKANSAS OF THE PROJECT SITE OR OF THE OPERATION OR MAINTENANCE OF ANY INSTALLED SYSTEM IS SOLELY FOR THE INFORMATION OF ENTERGY ARKANSAS AND THAT, IN PERFORMING ANY SUCH INSPECTION OR REVIEW OR IN ACCEPTING A SERVICED SYSTEM, ENTERGY ARKANSAS MAKES NO REPRESENTATIONS OR WARRANTY WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AS TO THE ECONOMIC OR TECHNICAL FEASIBILITY, CAPABILITY, SAFETY OR RELIABILITY OF THE SYSTEM AS SERVICED BY CONTRACTOR.**

iv. Contractor acknowledges that Entergy Arkansas makes no express warranty or representation regarding the qualifications of ICF.

ON BEHALF OF THE CONTRACTOR, I HAVE READ AND UNDERSTAND THE TERMS OF THIS AGREEMENT AND VOLUNTARILY ENTER INTO IT.

Contractor _____

Authorized representative _____

Title _____

Tax ID number _____

Date _____

Signature _____

Entergy Solutions participating contractor Yes/No

Cities/areas or zip codes serviced _____

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MF Web Page

Entergy
Entergy Arkansas, Inc.
Residential Customers
Business Customers
MAIN PAGE
myADVISOR
myHOME
myRESOURCES
myACCOUNT
Multifamily Program
Save Energy. Save Money.
Energy-Saving Calculators
Energy Efficiency Programs
myAccount
Access your account.

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Entergy Arkansas Multifamily Program

WALK-THROUGH ASSESSMENT REPORT

Prepared for:	Operated by:	Prepared by:
Property Name	Manager Name	Entergy Solutions
Address 1	Address 1	Program Team
Address 2	Address 2	Date

Insert picture of property

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MF Summary Report Template, page 2

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

INTRODUCTION

Thank you for your participation in the Entergy Solutions Multifamily Program. We hope that you and your tenants are enjoying the items installed in at the property.

You may be eligible to participate in other Entergy Solutions programs, giving you opportunities to enjoy additional energy and money savings. The following are potential Entergy Arkansas programs that could benefit your property and tenants.

Cool Saver® Residential Program	Improve the efficiency of your air conditioner or heat pump through a high-efficiency A/C tune-up. Receive an instant savings coupon toward the cost when you choose a participating contractor.
Summer Advantage Program	Receive cash incentives by helping keep electric rates low. A Direct Cycling Unit is installed on your air conditioner; during periods of increased demand, Entergy Arkansas activates the DCU causing the air conditioner to run less.

To identify additional future opportunities to improve energy performance, an Energy Efficiency Opportunity Walk-Through Assessment was conducted by the Entergy Solutions team on **DATE**. **NAME** was present during the assessment.

This Walk-Through Assessment Report is the basic starting point for building energy optimization. It involved brief interviews with site operating personnel, a review of the facility's utility bills, and an abbreviated walk-through of the building. The assessment was geared toward the identification of potential for energy improvements, understanding the general building configuration and defining the type and nature of energy systems.

The following pages contain a summary of our observations and suggestions for future actions that can help reduce energy use at your property.

Please feel free to contact us at 501-244-9523 if you have any questions about your Report.

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

SUMMARY OF OBSERVATIONS

Page 3 of X
Property Name – Month Year

8.50 x 11.00 in

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AN ENTERGY ARKANSAS PROGRAM

NOTABLE PHOTOS

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

RECOMMENDATIONS

Low Cost/No Cost Energy Efficiency Opportunities

Control Lighting on a Time Schedule

Energy savings can be achieved by reducing the hours lighting is operated in a facility. For areas where there is a predictable occupancy pattern, the best means of control is through a time schedule. For this facility, opportunities for savings exist. Controlling lights on a time schedule can be accomplished with a simple time clock, or through an energy management system. The time clock is a simple and inexpensive solution, while the energy management system can allow more flexible control strategies (temporary overrides, holiday schedules, etc.) and the opportunity for remote monitoring and control.

Implementation costs will depend on the type of lighting control and any rewiring that may be required. Savings estimates should be reviewed in more detail before installing the recommended controls.

► ***Action Steps:*** *Work with an electrician or energy management system vendor to install controls.*

Install Programmable Thermostats and Set Back Temperatures

Programmable thermostats can save on heating, cooling, and fan energy usage in areas where HVAC equipment is controlled by non-programmable thermostats or other types of temperature controls. Temperatures can be set back at night, and fan motors can operate on demand. For this facility, opportunities for programmable thermostats exist. Savings from using programmable thermostats can vary from 5 to 30 percent of heating and cooling energy consumption. Savings will vary based on the type of HVAC equipment in use, the insulation in the building, the temperature settings, and the climate.

► ***Action Steps:*** *Work with a mechanical contractor to install programmable thermostats.*

Implement an Air Filter Maintenance Program

Changing filters will allow the system to operate more efficiently. Clean filters improve airflow and heating and cooling capacity, reducing the need for manual coil cleanings, and improving the air quality of the space. High efficiency filters are recommended. Savings are difficult to quantify, and were not calculated for this report. Replacing the filters will immediately improve the operation of the units for a very low cost.

► ***Action Steps:*** *Work with in-house or external maintenance personnel to replace filters.*

Reduce Energy Losses from Uncontrolled Air Flow

Energy can be wasted due to air flow between conditioned and unconditioned spaces. Savings from these measures are difficult to quantify, and are not included in this report. Some of the fixes will be relatively easy and inexpensive, while others may require more complex solutions.

► ***Action Steps:*** *Work with in-house or external maintenance personnel to close off or seal up openings.*

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Reduce Domestic Hot Water Temperature

Energy can be saved by reducing the hot water temperature to a minimum acceptable temperature, typically 120°F. There are no implementation costs, so the simple payback is immediate.

► ***Action Steps:*** *Have in-house staff change the hot water set point.*

Employee Energy Education Program

An employee energy education program can raise awareness among employees about how energy is used in the building, and provide recommendations on how employees can help save energy and reduce costs. Energy-saving tips can include proper operation of thermostats, personal computers, light switches, copy machines and printers. Savings estimates for energy education programs are difficult to quantify and vary widely. Savings were conservatively estimated at 1 percent of current consumption and cost. Costs will vary based on the level of sophistication of the program.

► ***Action Steps:*** *Develop an energy education program for staff.*

Benchmark Portfolio of Facilities

Benchmarking all facilities will help the organization identify the best performers for recognition, uncover the worst performers to target for improvement and determine the energy savings that could be achieved by upgrading all facilities to a high level of energy performance.

► ***Action Steps:*** *Track utility data for all facilities. The Entergy Solutions team can provide guidance.*

Specify ENERGY STAR® Equipment

Organizations can save energy by using ENERGY STAR equipment in purchasing specifications wherever possible. Equipment bearing the ENERGY STAR label can include copy machines, printers, air conditioners and refrigerators. This type of equipment replacement sometimes has a long payback on a retrofit basis. When purchasing new equipment, however, the savings from the energy-efficient model will usually pay for the additional cost within a reasonable payback period.

► ***Action Steps:*** *Develop purchasing specifications for ENERGY STAR products.*

Specify ENERGY STAR Vending Machines

The Environmental Protection Agency uses the ENERGY STAR label to help consumers purchase energy-efficient equipment, including televisions, computers, and air conditioners. EPA recently extended the availability of the ENERGY STAR label to energy-efficient vending machines. ENERGY STAR certified vending machines incorporate more efficient compressors, fan motors and/or lighting systems to keep beverages cool and the machine visible while using less energy.

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Energy Efficiency Opportunities Requiring Capital Outlay

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The energy costs for the building can be reduced by converting to High Performance T8 or T5 lamps with electronic ballasts. Energy use for lighting can be reduced by 30 to 40 percent, while maintaining or improving existing light levels.

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Our team noticed incandescent lamps in fixtures during our walk through. By converting to fluorescent or compact fluorescent lamps, similar light levels could be achieved in this space for about a quarter of the energy cost. There are different options for replacing incandescent lighting fixtures, depending on the application. They can be replaced with screw-in compact fluorescent replacements in the existing sockets, or with new compact fluorescent fixtures or retrofit kits with pin-based compact fluorescent lamps. In addition to energy consumption, it is important to consider first cost, lamp life, lamp replacement costs, quality of light and lamp performance when selecting the correct solution for a given application. For some applications, new linear fluorescent fixtures, ceramic metal halide fixtures or even LED lighting may be appropriate.

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

NEXT STEPS

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Entergy Arkansas Program Manager
Gerardo Galdamez
501-377-4459

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Entergy Arkansas Multifamily Program

WALK-THROUGH ASSESSMENT REPORT

Prepared for:	Operated by:	Prepared by:
Woodland Ridge	Ben Caston Sr.	Entergy Solutions
400 N. Conway St.	400 N. Conway	Program Team
Heber Springs, AR 72543	Monticello, AR 71655	February 2013

Entergy
THE POWER OF PEOPLE

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

INTRODUCTION

Thank you for your participation in the Entergy Solutions Multifamily Program. We hope that you and your tenants are enjoying the items installed in at the property.

You may be eligible to participate in other Entergy Solutions programs, giving you opportunities to enjoy additional energy and money savings. The following are potential Entergy Arkansas programs that could benefit your property and tenants.

Cool Saver® Residential Program	Improve the efficiency of your air conditioner or heat pump through a high-efficiency A/C tune-up. Receive an instant savings coupon toward the cost when you choose a participating contractor.
Summer Advantage Program	Receive cash incentives by helping keep electric rates low. A Direct Cycling Unit is installed on your air conditioner; during periods of increased demand, Entergy Arkansas activates the DCU causing the air conditioner to run less.

To identify additional future opportunities to improve energy performance, an Energy Efficiency Opportunity Walk-Through Assessment was conducted by the Entergy Solutions team on January 31, 2013. Julie Guthrie was present during the assessment.

This Walk-Through Assessment Report is the basic starting point for building energy optimization. It involved brief interviews with site operating personnel, a review of the facility's utility bills, and an abbreviated walk-through of the building. The assessment was geared toward the identification of potential for energy improvements, understanding the general building configuration and defining the type and nature of energy systems.

The following pages contain a summary of our observations and suggestions for future actions that can help reduce energy use at your property.

Please feel free to contact us at 501-244-9523 if you have any questions about your Report.

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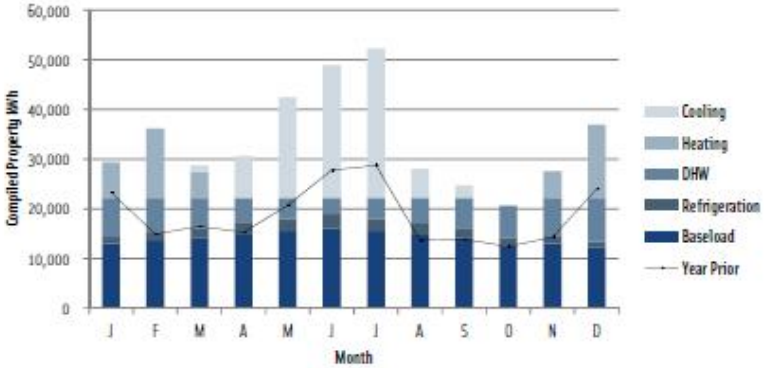
ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

SUMMARY OF OBSERVATIONS

The best impact potential for future energy efficiency upgrades for this property appears to be the attention the building envelope as a whole. Weather stripping around doors could offer potential low-cost ways to reduce uncontrolled air flow through the units. In addition, windows would benefit from the addition of caulk or silicone around the inside and outside of the border of each window. This multifamily property has a good layout and plenty of shade to keep the sun off of the 24 units total units in the complex. There are two stories to the properties and a community laundry room. The lighting on the complex is not abundant, but has a sufficient amount in common areas. A/C units are, on average, between six and 12 years old with the exception of a few newer units. The insulation on refrigerant lines would all benefit from work, as the weather has taken its toll on what is currently there. Overall, the property appears to be very well maintained. Energy consumption (electric) is summarized in the table below.



Recommendations are divided into low cost/no cost opportunities, opportunities requiring capital outlay and opportunities requiring further study. Each of the opportunities is described in more detail in the remainder of the report.

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NOTABLE PHOTOS

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ENTERGY SOLUTIONS
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RECOMMENDATIONS

Low Cost/No Cost Energy Efficiency Opportunities

Control Lighting on a Time Schedule

Energy savings can be achieved by reducing the hours lighting is operated in a facility. For areas where there is a predictable occupancy pattern, the best means of control is through a time schedule. For this facility, opportunities for savings exist. Controlling lights on a time schedule can be accomplished with a simple time clock, or through an energy management system. The time clock is a simple and inexpensive solution, while the energy management system can allow more flexible control strategies (temporary overrides, holiday schedules, etc.) and the opportunity for remote monitoring and control.

Implementation costs will depend on the type of lighting control and any rewiring that may be required. Savings estimates should be reviewed in more detail before installing the recommended controls.

► ***Action Steps:*** *Work with an electrician or energy management system vendor to install controls.*

Install Programmable Thermostats and Set Back Temperatures

Programmable thermostats can save on heating, cooling, and fan energy usage in areas where HVAC equipment is controlled by non-programmable thermostats or other types of temperature controls. Temperatures can be set back at night, and fan motors can operate on demand. For this facility, opportunities for programmable thermostats exist. Savings from using programmable thermostats can vary from 5 to 30 percent of heating and cooling energy consumption. Savings will vary based on the type of HVAC equipment in use, the insulation in the building, the temperature settings, and the climate.

► ***Action Steps:*** *Work with a mechanical contractor to install programmable thermostats.*

Implement an Air Filter Maintenance Program

Changing filters will allow the system to operate more efficiently. Clean filters improve airflow and heating and cooling capacity, reducing the need for manual coil cleanings, and improving the air quality of the space. High efficiency filters are recommended. Savings are difficult to quantify, and were not calculated for this report. Replacing the filters will immediately improve the operation of the units for a very low cost.

► ***Action Steps:*** *Work with in-house or external maintenance personnel to replace filters.*

Reduce Energy Losses from Uncontrolled Air Flow

Energy can be wasted due to air flow between conditioned and unconditioned spaces. Savings from these measures are difficult to quantify, and are not included in this report. Some of the fixes will be relatively easy and inexpensive, while others may require more complex solutions.

► ***Action Steps:*** *Work with in-house or external maintenance personnel to close off or seal up openings.*

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Reduce Domestic Hot Water Temperature

Energy can be saved by reducing the hot water temperature to a minimum acceptable temperature, typically 120°F. There are no implementation costs, so the simple payback is immediate.

► ***Action Steps:*** *Have in-house staff change the hot water set point.*

Employee Energy Education Program

An employee energy education program can raise awareness among employees about how energy is used in the building, and provide recommendations on how employees can help save energy and reduce costs. Energy-saving tips can include proper operation of thermostats, personal computers, light switches, copy machines and printers. Savings estimates for energy education programs are difficult to quantify and vary widely. Savings were conservatively estimated at 1 percent of current consumption and cost. Costs will vary based on the level of sophistication of the program.

► ***Action Steps:*** *Develop an energy education program for your staff.*

Benchmark Portfolio of Facilities

Benchmarking all facilities will help the organization identify the best performers for recognition, uncover the worst performers to target for improvement and determine the energy savings that could be achieved by upgrading all facilities to a high level of energy performance.

► ***Action Steps:*** *Track utility data for all facilities. The Entergy Solutions team can provide guidance.*

Specify ENERGY STAR® Equipment

Organizations can save energy by using ENERGY STAR equipment in purchasing specifications wherever possible. Equipment bearing the ENERGY STAR label can include copy machines, printers, air conditioners and refrigerators. This type of equipment replacement sometimes has a long payback on a retrofit basis. When purchasing new equipment, however, the savings from the energy-efficient model will usually pay for the additional cost within a reasonable payback period.

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MF Customer Feedback Power Point, Slide 1

Entergy Solutions Multifamily Homes Program

Customer Feedback 2013

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MF Customer Feedback Power Point, Slide 2

Multifamily Homes: Property Manager Feedback

"I have had a couple of tenants say it has helped save on their light bill after I asked them if this program has lowered their utility bill any."

– ***Diane Hyde***
Site Manager
Leachville and Marmaduke Apartments

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MF Customer Feedback Power Point, Slide 3

Multifamily Homes: Property Manager Feedback

"The tenants appreciate the savings and like the brightness of the bulb. The tenants also like how it lowers their light bill."

– ***Diana Conard***
Gardengate Apartments
Green Forest, AR

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MF Customer Feedback Power Point, Slide 4

Multifamily Homes: Property Manager Feedback

"It's great that y'all are helping these elderly people that live on a fixed budget."

– ***Charlotte Raino***
Heritage Manor of Wilmot (AAA)
Wilmot, AR

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MF Customer Feedback Power Point, Slide 5

Multifamily Homes: Property Manager Feedback

"The program was great and everyone was very nice. I am glad that they gave us new bulbs and the thing for the faucets and showers."

– ***Vanessa Weathers***
Four Seasons Apartments
Marion, AR

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MF Customer Feedback Power Point, Slide 6

Multifamily Homes: Property Manager Feedback

"This program definitely helped out on the light bill. The aerators are very efficient."

– ***Alma Autry***
Cushman Housing
Cushman, AR

"Anytime you can save a little energy is a welcome idea."

– ***Margene Coles***
Parkview Manor Apartments
Cave City, AR

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MF Customer Feedback Power Point, Slide 7

Multifamily Homes: Property Manager Feedback

(No Pictures)

"They did a real good job, they got in and got out. I think it is a good program."

– ***Judy George***
Swifton Apartments
Swifton, AR

"The tenants like the bulbs because they last a long time and they do not have to buy bulbs as often."

– ***Eva Brimer***
Oak Ridge Apartments
Russell, AR

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2.13 Manufactured Homes

MFRD Program Manual

Entergy Arkansas, Inc.

2013 Manufactured Homes Program Manual

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Prepared by:

CF International
Little Rock, AR

Contact:

866-627-9177
ManufacturedEA@cfi.com
entergyarkansas.com

Version 1.0
Revised July 8, 2013

Entergy
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MFRD Program Manual, page 3

Program Overview

Program Description

The EAI Manufactured Homes Program provides cost-effective energy efficiency measures to the manufactured homes market throughout the EAI, Inc. (EAI) electric service territory. Through the program, direct installation technicians managed by ICF, will install energy efficiency measures at eligible manufactured home communities at no cost to property owners or residents. The program will also suggest other areas for improvements and opportunities for participation in additional EAI programs.

Program Objectives

The primary objective of the program is to install no-cost energy efficiency measures in both common areas and individual homes, and to help community owners and residents reduce energy usage. In addition, the program will provide information to owners and residents about energy consumption and how to use energy wisely.

Program Participation

STEP 1: Enroll in the program by calling an account manager at 866-627-9177 or by emailing an enrollment form* to **ManufacturedEAI@icfi.com**.

STEP 2: Schedule an appointment to have an direct installation technician visit your manufactured home to install the program measures and conduct your energy survey. An adult representative should plan to be present for the duration of the energy survey and product installation, which will take up to one half hour.

STEP 3: Sign the completed survey document and provide any comments or suggestions about the program.

STEP 4: Receive a report in the mail or by email that summarizes the work performed.

Program Eligibility

- Owners of manufactured homes or renters (certifying required consent) of manufactured homes located within the EAI electric service territory are eligible for the EAI Manufactured Homes Program.
- There are no maximum limits to the size of a park or complex.
- Funds are limited and services are available in select geographic areas on a first-come, first-served basis.
- For information about other EAI programs, please visit entergyarkansas.com.

Program Benefits

Direct Install Measures

In this program, energy-efficient products are furnished and installed at no cost to EAI manufactured home customers. The installed measures available for direct installation in eligible properties and locations are as follows:

8.50 x 11.00 in

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- ENERGY STAR CFLs (13 watt, 18 watt and 23 watt) in fixtures and lamps that replace incandescent bulbs (limited to ten CFLs per unit).
- 1.5 gallons per minute showerheads and faucet aerators (when existing fixtures have flow rates of 2.0 gallons per minute or greater and where the water heater is powered by electricity).

Energy Survey Services

Included with the site visit is a complementary energy survey of the home and applicable equipment. Customers will receive a summary report of the property's potential energy savings as well as information about other EAI programs for which they may be eligible.

Program Quality Management

Post Inspection

Completed projects will be subjected to a post-installation inspection, selected on a random basis. Typically, it will consist of 5 - 10 percent of the installations. Post installation verifications can either be conducted on site or by telephone. If it is determined that an onsite post-inspection is going to be performed, a program representative will contact the customer to ask about the installation and visit the property site.

Terms and Condition

- **MANUFACTURED HOMES PROGRAM:** The EAI Manufactured Homes Program service includes the installation of energy-saving measures at the time of the site visit by an EAI authorized representative. Property owners that participate in the program will receive a summary report via mail/email.
- **SUMMARY REPORT:** The Manufactured Homes Program summary will provide the customer with a compiled review of energy-saving measures installed throughout the property, and recommendations related to energy efficiency programs available. EAI will not be responsible for lost documentation pertaining to the delivery.
- **ELIGIBILITY:** Funds are limited and services are available in select geographic areas on a first-come, first-served basis. Participants must be EAI electric utility customer. For information about other EAI programs, please visit www.entergyarkansas.com.
- **APPROVAL AND VERIFICATION:** EAI reserves the right to verify the delivery of services and to have reasonable access to the participant's residence to inspect the energy efficiency measures installed under this program.
- **TAX LIABILITY:** The customer is responsible for declaring and paying any and all applicable federal, state, and local taxes that may be owed on any incentive. EAI will not be responsible for any tax liability that may be imposed on the customer as a result of the delivery of direct installation measures. Please contact your tax professional for more information.
- **ENDORSEMENT:** EAI does not endorse any particular manufacturer, product, system design, or service in promoting this program.
- **INFORMATION RELEASE:** Participant agrees that EAI may include participant's name, EAI services, and

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MFRD Program Manual, page 5

resulting energy savings in reports or other documentation submitted to the program implementer on EAI' behalf and/or the Arkansas Public Service Commission.

- **LIMITATION OF LIABILITY:** EAI is not liable for any indirect, consequential or incidental damages or for any damages whatsoever connected with or resulting from participation in the Manufactured Homes Program.
- **NO WARRANTIES:** EAI DOES NOT WARRANT THE PROPER COMPLETION OF WORK OR PERFORMANCE OF INSTALLED PRODUCTS, EXPRESSLY OR IMPLICITLY. EAI does not endorse, guarantee, or warrant any particular manufacturer or product and EAI provides no warranties, expressed or implied, for any products or services. EAI makes no warranties of any kind, whether statutory, expressed, or implied, including without limitations, warranties of merchantability or fitness for a particular purpose regarding CFLs, efficient-flow showerheads, or faucet aerators. EAI makes no guarantee of energy-saving results by receiving direct measure installation. The customer acknowledges that neither EAI nor any of its consultants are responsible for assuring the design, engineering, and construction of the facility or installation of themeasures is proper or complies with any particular laws (including patent laws), codes or industry standards.
- **PROPERTY RIGHTS:** Participant represents that s/he has the right to complete and/or install the energy-saving measures on the property on which those measures are completed and/or installed, and that any necessary landlord's or tenant's consent, as the case may be, has been obtained.
- **RENTER'S CERTIFICATION:** Renter certifies that s/he has received consent from the landlord or homeowner for receipt of the energy survey and associated direct installation of measures.
- **RIGHT TO REFUSE:** The direct installation team has the right to refuse service or end the delivery when confronted by a customer acting inappropriately or when facing an unsafe situation. "Inappropriate" includes but is not limited to the following: unreasonable demands for service, personally threatening or offensive language, threatening or erratic behavior and personal contact. Authorized contractor reserves the right to exclude any premises, or vicinity therein, deemed potentially unsafe or harmful.
- **USE OF EMAIL ADDRESS:** EAI or the program implementer may contact participants via email, telephone, or fax in connection with the Manufactured Homes Program.
- **AUTHORIZATION, PROGRAM CHANGES, SUSPENSION OR CANCELLATION:** EAI may change the program requirements, incentives, or terms and conditions, including suspending acceptance of applications or terminating the program, at any time without notice.
- **MISCELLANEOUS:** These terms and conditions constitute the agreement between the parties and supersede all other communications and representations. By signing the survey form, the customer agrees to be bound by these Terms and Conditions.

Disclaimer

Neither EAI nor ICF makes any guarantee or any other representation or warranty, expressed or implied, as to the quality or effectiveness of any product(s) provided or work(s) performed through this program.

8.50 x 11.00 in

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MFRD Program Manual, page 6

Energy efficiency gains are subject to a number of variable conditions and circumstances. While it is the intent of the Program to achieve energy efficiencies, neither EAI nor ICF International guarantees or warrants that any specific energy efficiency gains will be achieved for a particular customer participating in the program.

MFRD Program Overview

Entergy Arkansas Manufactured Homes Program

Save Energy. Save Money.

The Entergy Arkansas Manufactured Homes Program is designed to help eligible manufactured home community managers and residents save on monthly utility costs through the installation of select energy efficiency measures.

Energy-saving products will be installed by a team of Entergy Arkansas field technicians in eligible* homes at no cost to owners or residents.

Compact Fluorescent Light Bulbs

CFLs will be installed in fixtures or table lamps in each unit.

- CFLs last up to 10 times longer than traditional incandescent bulbs.
- CFLs use up to 75 percent less energy than traditional bulbs.

Energy-Efficient Showerheads

Eligible showerheads will be replaced with new, energy-efficient showerheads.

- The showerheads are corrosion-resistant, self-cleaning and maintenance-free.
- The 1.5 gallons-per-minute showerhead uses 40 percent** less water compared to a standard showerhead, meaning less energy is used to heat water for showers.

Kitchen and Bathroom Faucet Aerators

Energy-efficient, 1.5 gallons-per-minute faucet aerators will be installed in the kitchen and bathroom.

- The aerators are made of long-lasting materials.
- They use 31 percent** less water compared to a standard faucet, meaning less energy is used for water heating.

Pipe Insulation

Pipes connected to your water heater will be insulated.

- This measure will help reduce the time it takes for hot water to reach your tap and will reduce the costs associated with heating water.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

For Community Managers

An Entergy Arkansas Energy Efficiency contractor also will perform a survey of your property's heating, cooling and lighting systems at no cost. This survey will identify opportunities for future energy efficiency improvements.

Learn more about the Entergy Arkansas Manufactured Homes Program by visiting us online at entergyarkansas.com, calling us at 866-627-9177 or by email at entergysolutions@icfi.com.

*Water efficiency products are only available to those customers who have an electric water heater.

**Savings are approximate and will vary with efficiency of heating and water heating system, temperature of incoming and outgoing water and number of occupants in the home.

Entergy.
THE POWER OF PEOPLE®

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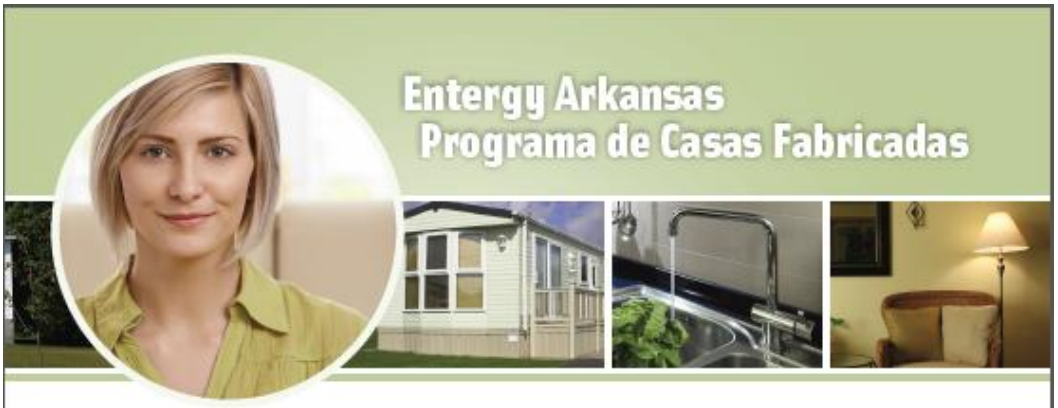
MFRD Program Overview, Spanish



Entergy Arkansas
Programa de Casas Fabricadas

Ahorre Energía. Ahorre Dinero.

El Programa de Casas Fabricadas Arkansas de Entergy esta diseñado para ayudar a los gerentes y residentes elegibles para casas fabricadas (móviles) ahorrar en sus cuentas mensuales de gastos eléctricos atreves de la instalación de ciertas medidas de eficiencia en el uso de la energía.

Productos que ahorran energía se instalaran* por un equipo de técnicos en el campo de Entergy Arkansas a ningún costo para los dueños o residentes.

Bombillas de Luz Compacta Fluorescente

Las bombillas de luz compacta fluorescente se instalaran en aparatos fijos de iluminación o en lámparas de mesa en cada unidad.

- Las bombillas de luz compacta fluorescente duran hasta diez veces más que las bombillas incandescentes.
- Las bombillas de luz compacta fluorescente utilizan menos energía que las bombillas tradicionales.

Regaderas Eficientes en el uso de la Energía

Las regaderas elegibles serán remplazadas con regaderas eficientes en uso de energía con nuevas.

- Las regaderas son resistentes a la corrosión, se limpian solas y se mantienen gratis.
- La regadera de 1.5 galones por minuto utilizan 40 por ciento** menos comparado a una regadera estándar, significa que menos energía es utilizada para calentar agua para las duchas.

Aerificadores en los Grifos de Cocina y Baño

Aerificadores eficientes en el uso de la energía se instalaran en los grifos de cocina y baño.

- Los aerificadores están hechos de materiales durables.
- Utilizan 31 por ciento** menos agua comparado a un grifo estándar, significa que utilizan menos energía para calentar agua.

Tubería Aislada

La tubería conectada al calentador de agua debe estar aislada.

- La medida ayudara a reducir el tiempo que toma para que el agua caliente llegue a su llave y esto reducirá el gasto asociado con calentar agua.

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

For Community Managers

Los técnicos en el campo de Entergy Arkansas también realizaran una encuesta de energía de los sistemas principales de su propiedad (por ejemplo, calefacción, aire acondicionado e iluminación) a ningún costo. La encuesta identificara oportunidades para las futuras mejoras de eficiencia en el uso de la energía y a usted se le proporcionara un resumen con recomendaciones.

Aprenda más acerca del Programa de Casas Fabricadas de Entergy Arkansas al visitamos en línea en entergyarkansas.com, o llámenos al 866-627-9177 o vía correo electrónico a entergysolutions@icfi.com.

*Productos de agua eficiencia solo están disponibles para los clientes que tienen un calentador de agua eléctrico.

**Los ahorros son aproximados y varían con la eficiencia de calefacción y del sistema de calentador de agua, temperatura del agua entrante and que salen y el numero de ocupantes en la casa.

Entergy.
THE POWER OF PEOPLE*

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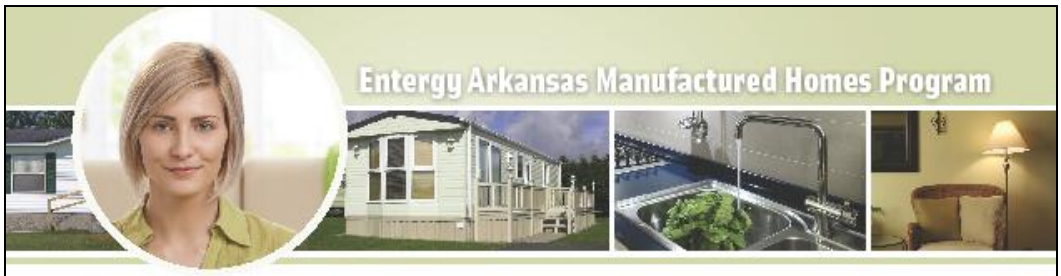
MFRD Program Terms & Conditions



Terms and Conditions

Manufactured Homes Program

The Entergy Arkansas, Inc. Manufactured Homes Program service includes the installation of energy-saving measures at the time of the site visit by an Entergy Arkansas authorized contractor. Property owners that participate in the program will receive a summary report from the authorized contractor by mail.

Summary Report

The Manufactured Homes Program summary will provide the customer with a compiled review of energy-saving measures installed throughout the property, and recommendations related to energy efficiency programs available. Entergy Arkansas will not be responsible for lost documentation pertaining to the delivery.

Eligibility

Funds are limited and services are available in select geographic areas on a first-come, first-served basis. Participants must be Entergy Arkansas electric utility customers. For information about other Entergy Arkansas programs, please visit entergyarkansas.com. Water efficiency products are only available to those customers who have an electric water heater.

Approval and Verification

Entergy Arkansas reserves the right to verify the delivery of services and to have reasonable access to the participant's residence to inspect the energy efficiency measures installed under this program.

Tax Liability

The customer is responsible for declaring and paying any and all applicable federal, state, and local taxes that may be owed on any incentive. Entergy Arkansas will not be responsible for any tax liability that may be imposed on the customer as a result of the delivery of direct installation measures. Please contact your tax professional for more information.

Endorsement

Entergy Arkansas does not endorse any particular manufacturer, product, system design or service in promoting this program.

Information Release

Participant agrees that Entergy Arkansas may include participant's name, Entergy Arkansas services and resulting energy savings in reports or other documentation submitted to the program implementer on Entergy Arkansas' behalf and/or the Arkansas Public Service Commission. Entergy Arkansas will treat all other information gathered in evaluations as confidential.

Limitation of Liability

Entergy Arkansas is not liable for any indirect, consequential or incidental damages or for any damages whatsoever connected with or resulting from participation in the Manufactured Homes Program.

No Warranties

Entergy Arkansas does not warrant the proper completion of work or performance of installed products, expressly or implicitly. Entergy Arkansas does not endorse, guarantee or warrant any particular manufacturer or product and Entergy Arkansas provides no warranties, expressed or implied, for any products or services. Entergy Arkansas makes no warranties of any kind, whether statutory, expressed or implied, including without limitations, warranties of merchantability or fitness for a particular purpose regarding Compact Fluorescent Light Bulbs, efficient-flow showerheads, faucet aerators or pipe insulation. Entergy Arkansas makes no guarantee of energy-saving results by receiving direct measure installation. The customer acknowledges that neither Entergy Arkansas nor any of its consultants are responsible for assuring the design, engineering and construction of the facility or installation of the measures is proper or complies with any particular laws (including patent laws), codes or industry standards.

Property Rights

Participant represents that s/he has the right to complete and/or install the energy-saving measures on the property on which those measures are completed and/or installed, and that any necessary landlord's or tenant's consent, as the case may be, has been obtained.

Renter's Certification

Renter certifies that s/he has received consent from the landlord or homeowner for receipt of the energy survey and associated direct installation of measures.

Right to Refuse

The Entergy Arkansas contractor has the right to refuse service or end the delivery when confronted by a customer acting inappropriately or when facing an unsafe situation. "Inappropriate" includes but is not limited to the following: unreasonable demands for service, personally threatening or offensive language, threatening or erratic behavior and personal contact. Authorized contractor reserves the right to exclude any premises, or vicinity therein, deemed potentially unsafe or harmful.

Use of Email Address

Entergy Arkansas or Entergy Arkansas' program implementer may contact participants via email in connection with the Manufactured Homes Program.

Authorization, Program Changes, Suspension or Cancellation

Entergy Arkansas may change the program requirements, incentives or terms and conditions, including suspending acceptance of applications or terminating the program, at any time without notice.

Miscellaneous

These terms and conditions constitute the agreement between the parties and supersede all other communications and representations. By executing an enrollment form, the customer agrees to be bound by these terms and conditions.

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THE POWER OF PEOPLE+

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MFRD Program Terms & Conditions, Spanish

Consentimiento de Términos y Condiciones

Programa de Casas Prefabricadas

El servicio del Programa de Casas Prefabricadas de Entergy Arkansas, Inc. (Entergy Arkansas) incluye la instalación de medidas que ahorren energía al mismo tiempo de la visita al sitio por un contratista autorizado de Entergy Arkansas. Los propietarios que participen en el programa recibirán un resumen del reporte del contratista autorizado vía correo/correo electrónico.

Resumen del Reporte

El resumen del Programa de Casas Prefabricadas proporcionara al cliente una revisión compilada de medidas para ahorrar energía que han sido instaladas en la propiedad y recomendaciones relacionadas a los programas de eficiencia en el uso de la energía disponibles. Entergy Arkansas no será responsable por documentación perdida relacionada con la entrega.

Elegibilidad

Los fondos y los servicios son limitados en áreas geográficamente seleccionadas en base al tiempo y en orden de llegada. Los participantes deben ser clientes de la compañía de electricidad Entergy Arkansas. Para mayores informes acerca de los programas de Entergy Arkansas, por favor visite entergyarkansas.com.

Aprobacion Y Verificacion

Funds are limited and services are available in select geographic areas on a first-come, first-served basis. Participants must be entergy arkansas electric utility customers. For information about other entergy arkansas programs, please visit entergyarkansas.com.

Exigible en Concepto de Impuestos

El cliente es responsable de declarar y pagar cualquier y todos los impuestos federales, estatales y locales que se deben por los incentivos. Entergy Arkansas no será responsable por cualquier responsabilidad de impuestos que apliquen como un resultado de la entrega de la instalación directa de medidas. Por favor póngase en contacto con su asesor de impuestos para mayores informes.

Promocion

Entergy Arkansas no promueve a ningún fabricante, producto, diseño de sistema, o servicio al promover este programa.

Publicacion de Informacion

Los participantes están de acuerdo que Entergy Arkansas puede incluir el nombre del participante, los servicios de Entergy Arkansas, y los resultados del ahorro de energía en reportes y otra documentación entregada al implementador del programa de Entergy Arkansas en nombre de/o La Comisión de Servicios Públicos de Arkansas. Entergy Arkansas tratara toda la información recabada en las evaluaciones como confidencial.

Limitacion de Responsabilidad

Entergy Arkansas no es responsable por ningún daño indirecto, consecuente o daños secundarios relacionados o que sean resultado de la participación en el Programa de Casa Prefabricadas.

Sin Garantias

Entergy Arkansas No Garantiza La Finalizacion Correcta Del Trabajo O El Rendimiento De Los Productos Instalados, Claramente O Implícitamente. Entergy Arkansas no promueve, no garantiza, no asegura a ningún fabricante o producto en particular y Entergy Arkansas no hace ninguna garantía de ningún tipo, ya sea establecida, expresada o implícita incluyendo sin limitaciones, garantías de comerciabilidad o el estado por cualquier propósito referente a las bombillas de luz compacta fluorescente, regaderas de bajo flujo, aerificadores de llaves o aislamiento en la tubería. Entergy Arkansas no hace garantías de los resultados de los ahorros de energía al recibir la instalación de medidas directas. El cliente reconoce que ni Entergy Arkansas ni sus consultores son responsables por asegurar el diseño, ingeniería, y construcción del complejo o la instalación de las medidas son propias o cumplen con alguna ley en particular (incluyendo leyes de patentes), códigos o estándares de la industria.

Derechos de Propiedad

El participante representa que el/ella tiene el derecho a llenar y/o instalar medidas que ahorren energía en la propiedad en la cual las medidas se llevaran a cabo y/o se instalaran, y que se haya obtenido el consentimiento preciso del arrendador o inquilino, cualquiera sea el caso.

Certificacion de Inquilinos

El inquilino certifica que obtuvo el consentimiento del arrendador o el dueño de la casa para recibir la encuesta de energía y la instalación directa asociada con las medidas.

Derecho A Negar

El Contratista de Entergy Arkansas tiene el derecho de negar el servicio o terminar la entrega cuando confrontado por un cliente que actué inapropiadamente o cuando se encuentre en una situación de peligro. "Inapropiado" incluye demandas de servicio, amenazas personales o lenguaje ofensivo, amenazas o comportamiento emítico y contacto personal. Los contratistas autorizados se reservan el derecho a excluir el particular, o los alrededores, que sean potencialmente inseguros o peligrosos.

Uso De Correo Electronico

Entergy Arkansas o el Implementador del Programa de Entergy Arkansas puede contactar a los participantes vía correo electrónico en relación al programa de Casas Prefabricadas.

Autorizacion, Cambios En El Programa, Suspensión O Cancelacion

Entergy Arkansas puede cambiar los requisitos, incentivos, términos y condiciones del programa incluyendo suspender la aceptación de solicitudes o concluir el programa en cualquier momento sin aviso previo.

Miscelaneo

Los términos y condiciones constituyen el acuerdo entre ambas partes y sobrepasan todas las comunicaciones y representaciones. Al ejecutar el formulario de inscripción, el cliente esta de acuerdo con los limites dentro de los Términos y Condiciones.

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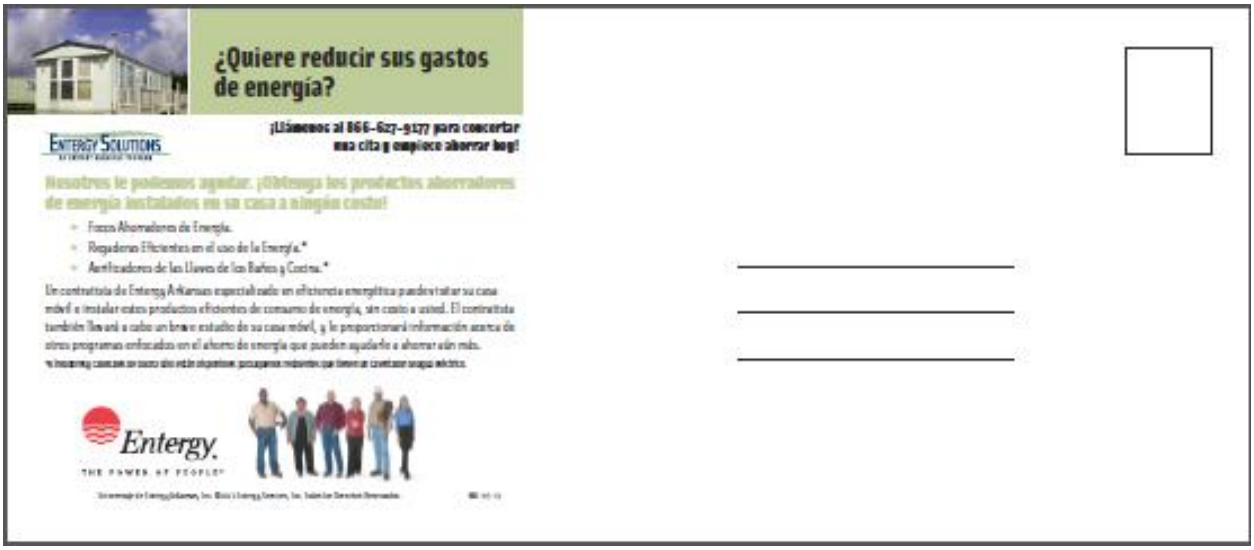
MFRD Program Direct Mailer

MFRD Program Direct Mailer, Reverse



MFRD Program Bill Insert

MFRD Program Bill Insert, Reverse (Spanish)

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MFRD Program Door Hanger

ENTERGY SOLUTIONS

Want to cut your energy costs?

We can help. Get energy-saving products installed in your home at no cost to you!

- Compact Fluorescent Light Bulbs.
- Energy-Efficient Showerheads.
- Kitchen and Bathroom Faucet Aerators.

An Entergy Arkansas energy efficiency contractor can visit your home and install these energy-saving products **at no cost to you.** The contractor will also perform a quick survey of your home and will provide information about additional energy-saving programs that could help you save even more.

Call us at 501-244-9523 to schedule an appointment and start saving today!

Entergy.

MFRD Program Door Hanger, Reverse (Spanish)

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

¿Quiere reducir sus gastos de energía?

Nosotros le podemos ayudar. ¡Obtenga los productos ahorradores de energía instalados en su casa a ningún costo!

- Focos Ahorradores de Energía.
- Regaderas Eficientes en el uso de la Energía.
- Aerificadores de las Llaves de los Baños y Cocina.

Un contratista en el uso eficiente de la energía de Entergy Arkansas puede visitar su casa e instalar estos productos ahorradores de energía a ningún costo para usted. El contratista también hará una encuesta rápida de su casa y le proporcionara información adicional de los programas que ahorran energía que le pueden ayudar ahorrar aun más.

¡Llámenos al 501-244-9523 para concertar una cita y empiece ahorrar hoy!

Entergy.
THE POWER OF PEOPLE

MFRD Appointment Card

MFRD Appointment Card, Reverse (Spanish)

MFRD Banner Stand

MFRD Letterhead

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

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MFRD Web Page

MFRD Customer Letter Report

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

April 10, 2013

Thank you for your participation in the Entergy Solutions Manufactured Homes Program! We hope that you are enjoying the items installed in your home. Your customized report is available on the reverse of this letter.

You may be eligible to participate in other Entergy Solutions programs, giving you opportunities to enjoy additional energy and money savings. Read below for more information.

Entergy Solutions Rewards	Get rewarded for reducing your energy use! Your actual energy use is tracked to calculate monthly savings. Cash in your energy savings for rewards points redeemable at top retailers.
Cool Saver® Residential Program	Improve the efficiency of your air conditioner or heat pump through a high-efficiency A/C tune-up. Receive an instant savings coupon toward the cost when you choose a participating contractor.
Summer Advantage Program	Receive cash incentives by helping keep electric rates low. A Direct Cycling Unit is installed on your air conditioner; during periods of increased demand, Entergy Arkansas activates the DCU causing the air conditioner to run less. This reduces peak electricity demand and keeps rates low.

Please visit us online at **entergy-arkansas.com/EntergySolutions** to learn more about the programs above, or contact us at 866-627-9177 for more information.

Sincerely,

Gerardo Galdamez

Gerardo Galdamez
Program Manager, Entergy Solutions

Hablamos Español. Si tiene alguna pregunta, por favor llámenos al 866-627-9177. Gracias!

Entergy®
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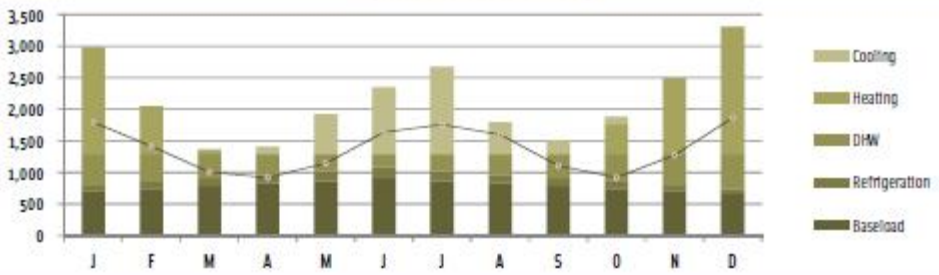
MFRD Customer Letter Report, Reverse

Field Team Information	
Visit Date:	3/12/2013
Field Team Lead:	Greg Pierce
Field Lead Phone:	479-970-8091
Field Lead Email:	greg.pierce@icfi.com

Your Home's Attributes	
Approximate Square Feet:	1,280
Approximate Vintage of Home:	1998 to present
Primary Fuel for Space Heating:	Electric
Primary Fuel for Domestic Hot Water:	Electric
Primary Air Conditioning:	Central AC
Electric Utility Provider:	Entergy Arkansas, Inc.

Name
Unit Number
Address
City, State, ZIP

Historical Electric Usage



Energy-Efficient Measures Installed in Your Home

Energy-Efficient Measures	Number Installed	Estimated Annual Utility Savings and Product Value		
		Electric	Product	Water/Sewer
Compact Fluorescent Light Bulbs	14	$45	$21	--
Energy-Efficient Showerheads	2	$24	$32	$14
Energy-Efficient Faucet Aerators	4	$12	$19	$6
Pipe Wrap Insulation (Linear Feet)	0	$0	$0	--

Total Estimated Year-One Value of Products Installed
$170
Estimated Savings Value Over the Lifetime of the Products Installed
$1,140

DID YOU KNOW:
That the electric usage at this home in LITTLE ROCK is about 56% different than the average manufactured home in Entergy Arkansas' area over the last 12 months.

Tips to Save More Energy:
Each degree above 68 that you set your thermostat in the winter adds approximately three percent to your heating costs.
Quick showers use less than one half as much hot water as a bath.

The calculated savings from measures installed at this property are estimates only. Actual savings may vary based on rates, usage and activity in the home.

MFRD Customer Feedback Power Point, Slide 1

Entergy Solutions Manufactured Homes Program

Customer Feedback 2013

icfi.com | Passion. **Expertise. Results.** 1

MFRD Customer Feedback Power Point, Slide 2

Manufactured Homes: Customer Feedback

"I couldn't believe that they are doing all this for free. I'm glad [Entergy] is helping us save."

– ***Judith Wright***
Hot Springs, AR

icfi.com | Passion. **Expertise. Results.** 2

MFRD Customer Feedback Power Point, Slide 3

Manufactured Homes: Customer Feedback

"I like that I can save money with this program!"

– ***Shantrese Harris***
Langley Trail Park
Conway, AR

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MFRD Customer Feedback Power Point, Slide 4

Manufactured Homes: Customer Feedback

"It gives me peace of mind because it's scary for me in my age to get on a ladder and change the bulbs, I like knowing that these bulbs will last longer."

– ***Judy Passmore***
Harrison, AR

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MFRD Customer Feedback Power Point, Slide 5

Manufactured Homes: Customer Feedback

"I liked that they not only installed energy saver products, but they also taught me how to be more energy efficient."

– ***Delia Grimaldo***
Knollwood Mobile Home Park
Alexander, AR

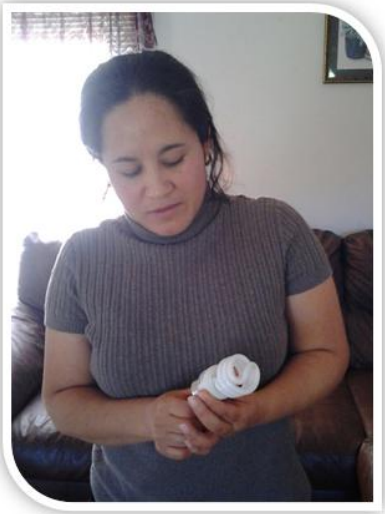
icfi.com | Passion. **Expertise. Results.** 5

MFRD Customer Feedback Power Point, Slide 6

Manufactured Homes: Customer Feedback

"I thought it was a very good service and the showerheads and lights work great!"

– ***Irma Saaedra***
Alexander, AR



icfi.com | Passion. **Expertise. Results.** 6

MFRD Customer Feedback Power Point, Slide 7

Manufactured Homes: Customer Feedback

"They were very friendly, they told me exactly what they were going to do."

– ***Vickey Peterson***
Dall Mobile Home Park
Little Rock, AR

icfi.com | Passion. **Expertise. Results.** 7

MFRD Customer Feedback Power Point, Slide 8

Manufactured Homes: Customer Feedback

"I was excited to know Entergy really cares for us, its customers, and has started these program to help us be more efficient in our energy use. I'm excited to see the savings I will have after the light bulb and shower head upgrades I received from your professional service men."

– ***Jerald Bunner***
South Park Mobile Home Park
El Dorado, AR

"It is very thoughtful, especially for the people who can't afford to make these little changes on their own."

– ***Candice L Rackley***
Town & County Mobile Home Park
Heber Springs, AR

"I thought it was really nice they came and did that. Those were expensive bulbs."

– ***Karen Brooks***
Combs Mobile Home Park
Hot Springs, AR

"It is a good program because we can save money."

– ***Irma Lara***
Knollwood Mobile Home Park
Alexander, AR

"The guys were great. I have no complaints. It is a good thing you are doing."

– ***Billy Null***
Yellville, AR

icfi.com | Passion. **Expertise. Results.** 8

MFRD Customer Feedback Power Point, Slide 9

Manufactured Homes: Customer Feedback

"Entergy is thinking about the customers and trying to help us save money."
– ***David Evans***
Country Living Mobile Home Park
Pine Bluff, AR

"[The installer] was super nice, treated us like family and informed us how and what to do to help save us in cost."
– ***Amy White***
Morrilton, AR

"I like that not only do they install energy saving products, but they also teach you to be more energy efficient."
– ***Jose Castro***
Knollwood Mobile Home Park
Alexander, AR

"I liked everything about it!"
– ***Eileen Merritt***
Cave City, AR

"I think it's a wonderful thing for persons like myself who are on a fixed income."
– ***Jeriel May***
Country Living
Pine Bluff, AR

icfi.com | Passion. **Expertise. Results.** 9

MFRD Customer Feedback Power Point, Slide 10

Manufactured Homes: Customer Feedback

"I think it's good. I'm all about energy efficiency and it also helps make people aware of the importance of energy efficiency."
– ***Jeff Green***
Pleasant Plains, AR

"I think that it is a good program to help lessen our footprint."
– ***Kaye Mazzia***
Dover, AR

"Very surprised and happy with the services… Thank you Entergy!!"
– ***Laura Maher***
W Mobile Home Park
Sheridan, AR

"I think this is a great program, especially for those who can't afford to do it ourselves."
– ***James Criswell***
Pleasant Grove, AR

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MFRD Customer Feedback Power Point, Slide 11

Manufactured Homes: Property Manager Feedback

- Channel 11 story with video:
  - Arkansas summer coming, so can energy savings.

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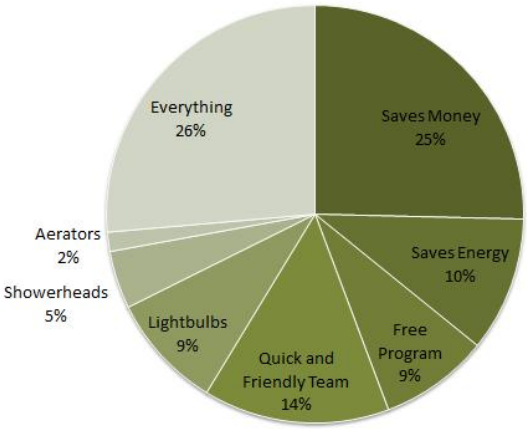
MFRD Customer Feedback Power Point, Slide 12

Manufactured Homes: Customer Feedback

16% of the customers provided comments or feedback.
This chart shows what they liked best about the program:



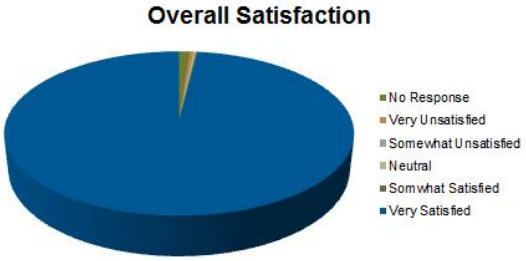
icfi.com | Passion. **Expertise. Results.** 12

MFRD Customer Feedback Power Point, Slide 13

Manufactured Homes: Customer Feedback

- 98.1 % of participants polled were satisfied or somewhat satisfied with this program.

Overall Satisfaction	
No Response	12
Very Unsatisfied	4
Somewhat Unsatisfied	0
Neutral	3
Somwhat Satisfied	2
Very Satisfied	994
Total	**1015**



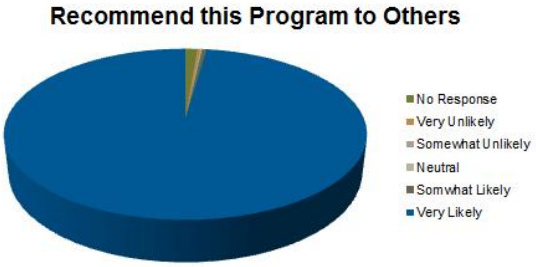
icfi.com | Passion. **Expertise. Results.** 13

MFRD Customer Feedback Power Point, Slide 14

Manufactured Homes: Customer Feedback

- 98.2 % of participants polled were very likely or somewhat likely to recommend this program to other customers.

Recommend Program	
No Response	13
Very Unlikely	3
Somewhat Unlikely	1
Neutral	1
Somewhat Likely	5
Very Likely	992
Total	1015



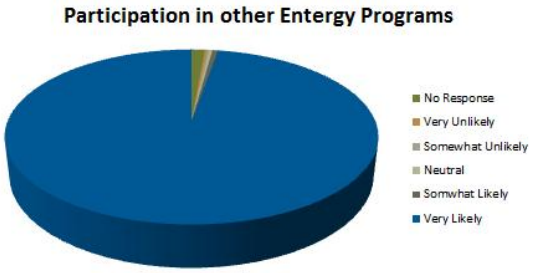
icfi.com | Passion. **Expertise. Results.** 14

MFRD Customer Feedback Power Point, Slide 15

Manufactured Homes: Customer Feedback

- 97.8 % of participants polled were very likely or somewhat likely to participate in other Entergy Programs.

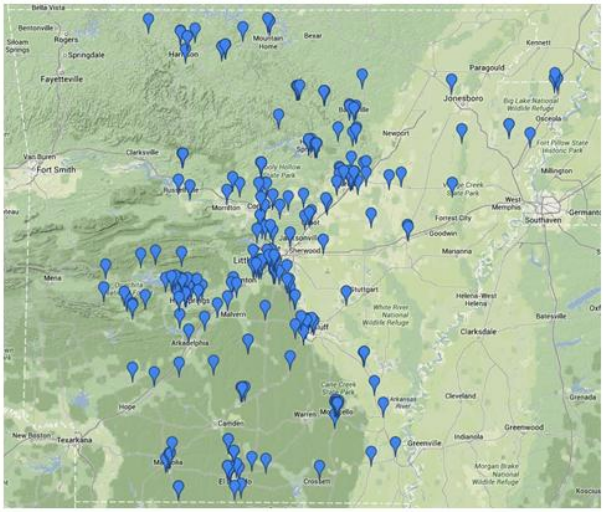
Additional Participation	
No Response	14
Very Unlikely	3
Somewhat Unlikely	2
Neutral	3
Somewhat Likely	6
Very Likely	987
Total	1015



icfi.com | Passion. **Expertise. Results.** 15

MFRD Customer Feedback Power Point, Slide 16

Manufactured Homes: Geospatial Distribution

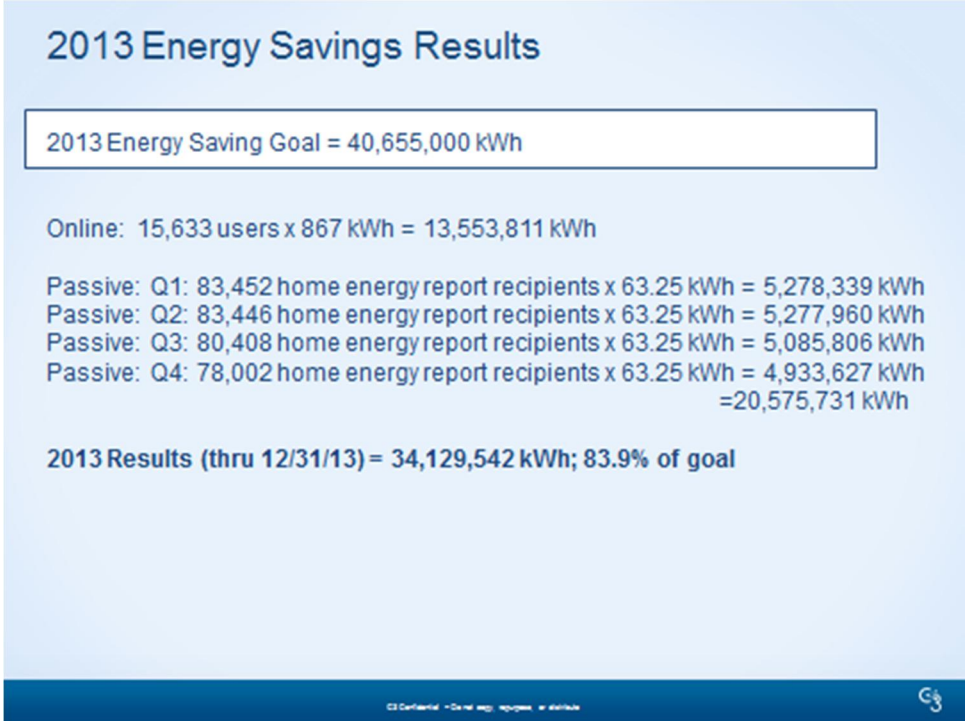


icfi.com | Passion. **Expertise. Results.** 16

2.14 Residential Benchmarking Pilot

C3 Energy PPT presentation, slide 1

C3 Energy PPT presentation, slide 2



C3 Energy PPT presentation, slide 3

Entergy Solutions Rewards Program Sign-Up Status

As of 12/31/13, 62.5% of the online program sign-up target has been achieved. There are 15,633 online/enrolled users YTD. The 2013 goal is 25,001.

Customer:	Entergy Arkansas
Program Goal	25,001

Online Participants	Prior Program Year	Jan-2013	Feb-2013	Mar-2013	Apr-2013	May-2013	Jun-2013	Jul-2013	Aug-2013	Sep-2013	Oct-2013	Nov-2013	Dec-2013	YTD % of Goal
Account Linked *	5,708	158	48	32	21	758	199	576	69	1,106	2,196	1,462	3,298	62.5%
Grand Total	5,708	5,866	5,914	5,946	5,967	6,725	6,924	7,500	7,569	8,677	10,873	12,335	15,633	

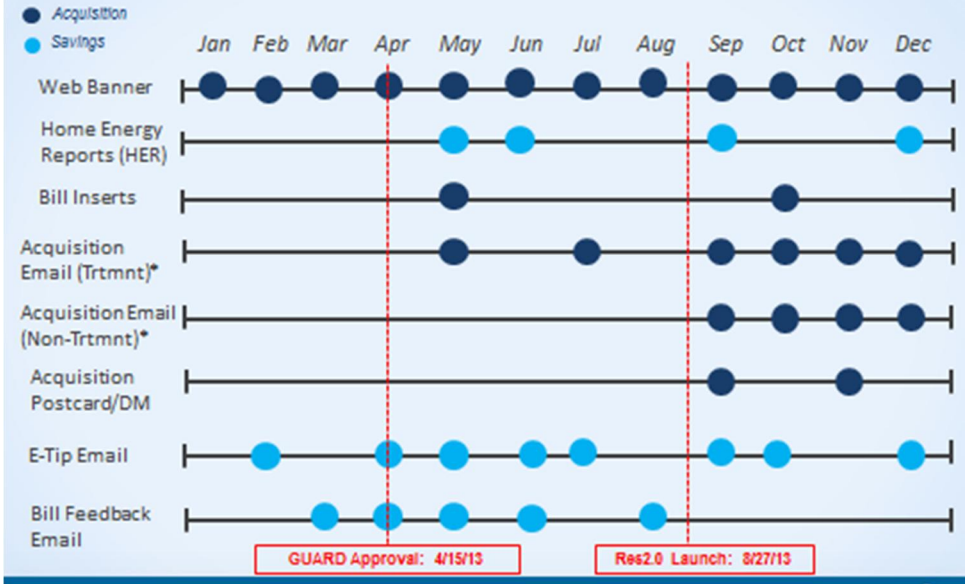
*Account Linked = Participants who have signed-up on the portal, confirmed email address, and have linked their utility acct

Account is included in the month in which the user linked their account, not the month the user first created their account.

C3 Energy PPT presentation, slide 4

2013 Marketing/Communication Calendar (YTD)

- Regular cadence of acquisition, savings and engagement marketing in 2013



C3 Energy PPT presentation, slide 5

2013 Energy Savings Results

2013 Energy Saving Goal = 40,655,000 kWh

Online: 15,633 users x 867 kWh = 13,553,811 kWh

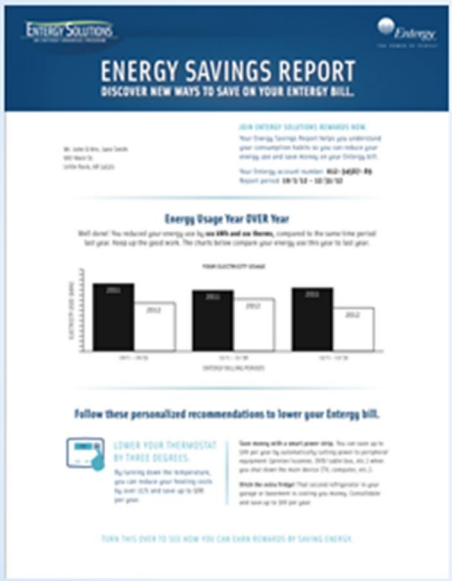
Passive: Q1: 83,452 home energy report recipients x 63.25 kWh = 5,278,339 kWh
Passive: Q2: 83,446 home energy report recipients x 63.25 kWh = 5,277,960 kWh
Passive: Q3: 80,408 home energy report recipients x 63.25 kWh = 5,085,806 kWh
Passive: Q4: 78,002 home energy report recipients x 63.25 kWh = 4,933,627 kWh
=20,575,731 kWh

2013 Results (thru 12/31/13) = 34,129,542 kWh; 83.9% of goal

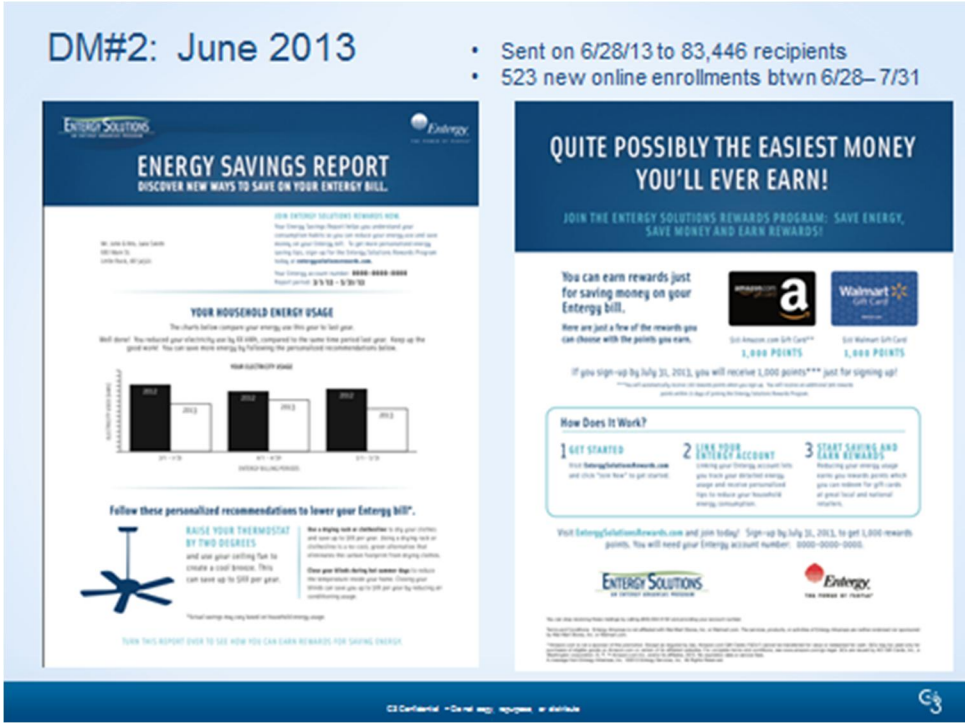
C3 Energy PPT presentation, slide 6

DM#1: May 2013

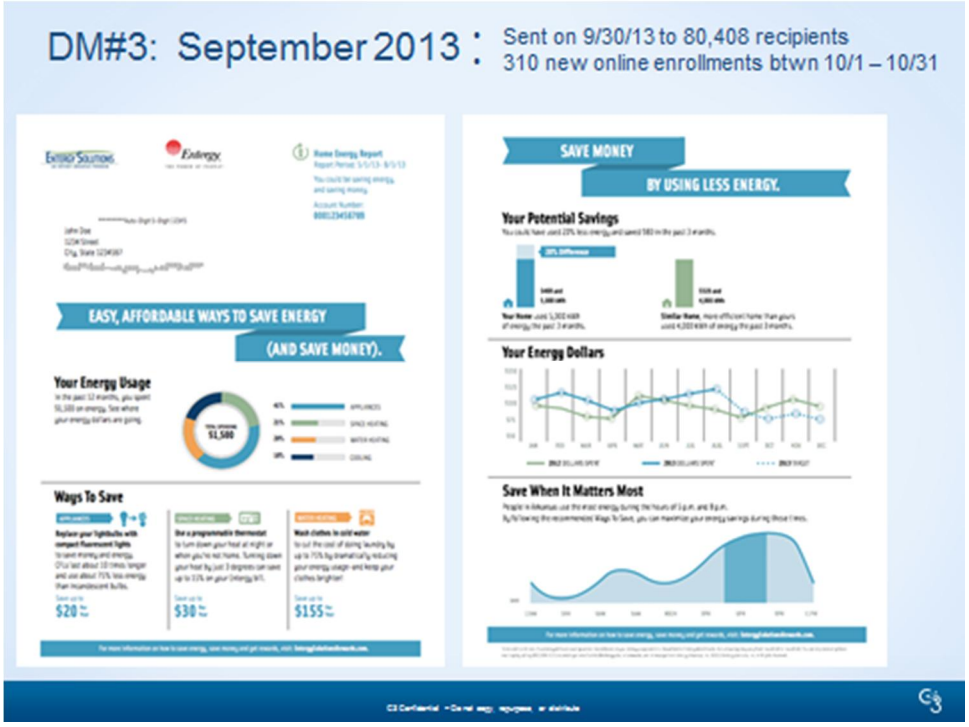
- Sent on 5/1/13 to 83,452 recipients
- 398 new online enrollments btwn 5/1 – 5/31



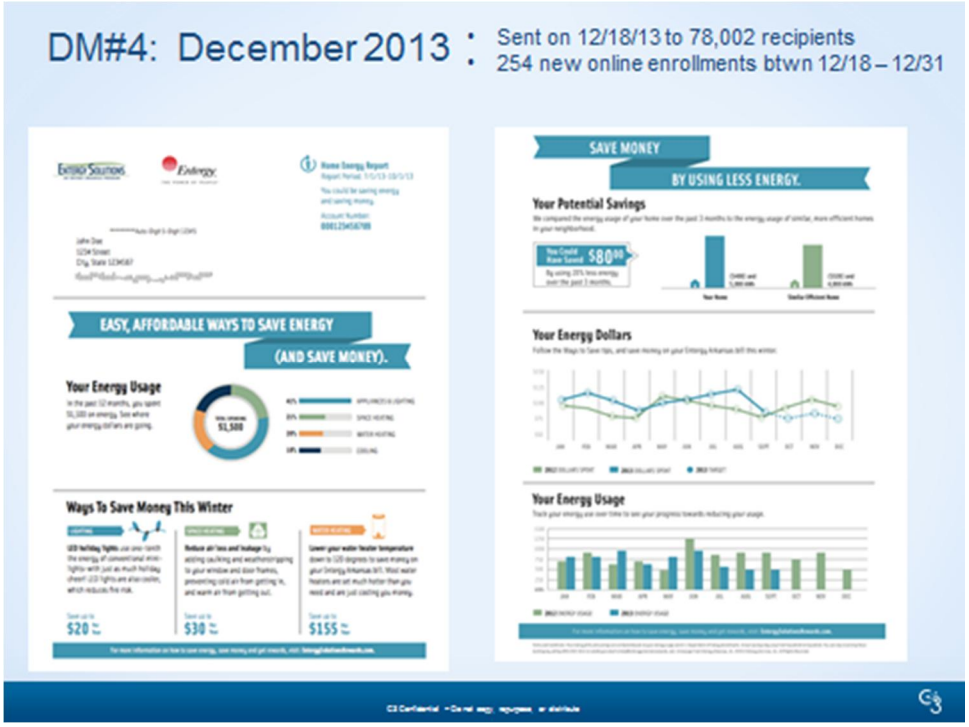
C3 Energy PPT presentation, slide 7



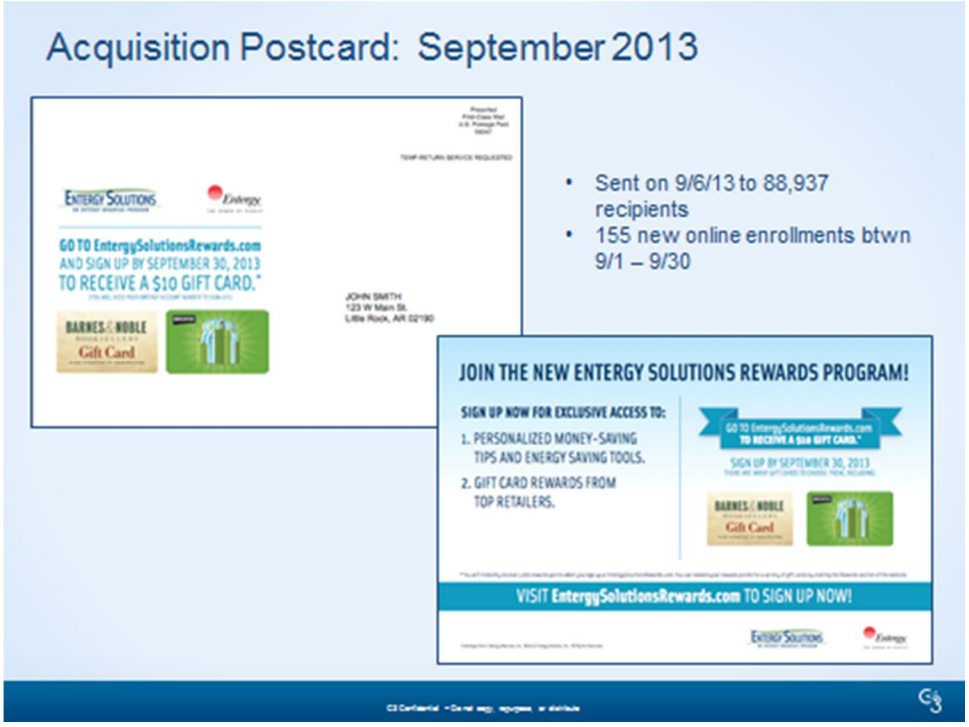
C3 Energy PPT presentation, slide 8



C3 Energy PPT presentation, slide 9



C3 Energy PPT presentation, slide 10

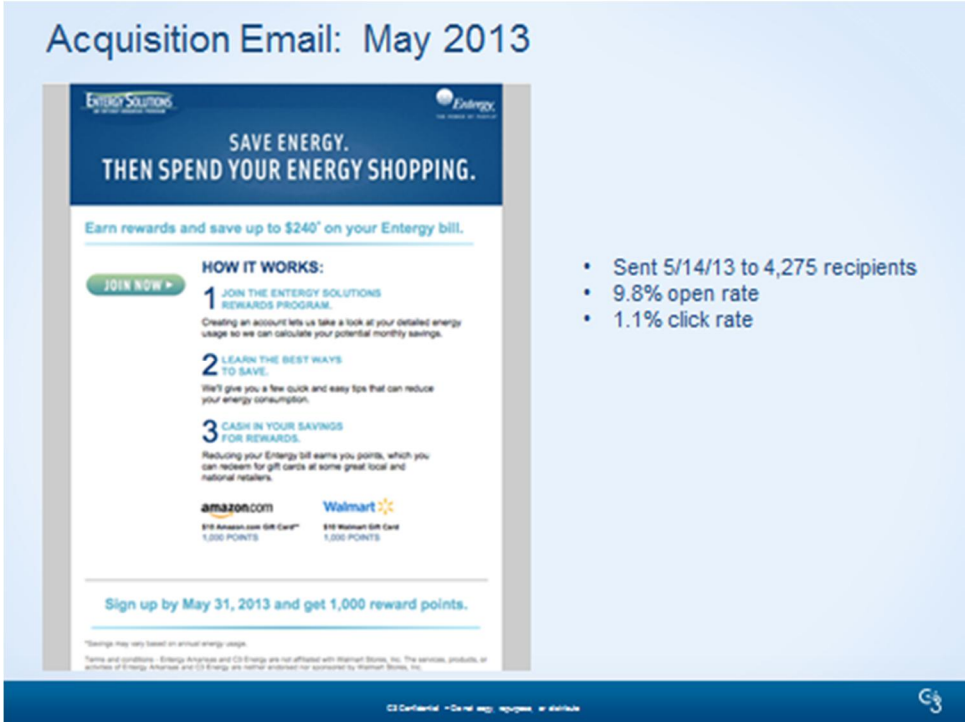


C3 Energy PPT presentation, slide 11

C3 Energy PPT presentation, slide 12

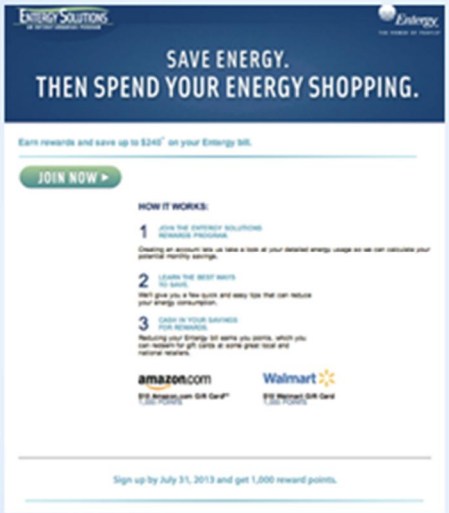
C3 Energy PPT presentation, slide 13

C3 Energy PPT presentation, slide 14



C3 Energy PPT presentation, slide 15

Acquisition Email: July 2013



- Sent 7/18/13 to 4,225 recipients
- Delivered to 4,119 recipients
- 14.6% open rate
- 0.85% click rate

C3 Energy PPT presentation, slide 16

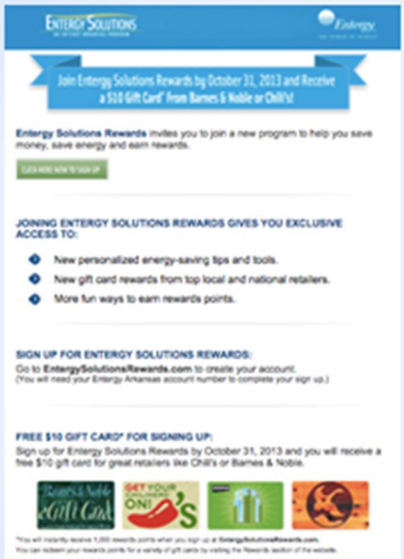
Acquisition Email: September 2013

- Sent 9/18/13 to 114,555 recipients
- Delivered to 104,805 recipients
- 15.8% open rate (16,509)
- 1.9% click rate (2,018)

- Sent 9/27/13 to 103,084 recipients
- Delivered to 101,626 recipients
- 15.7% open rate (15,915)
- 1.4% click rate (1,402)

C3 Energy PPT presentation, slide 17

Acquisition Email: October 2013



- Sent 10/15/13 to 24,087 recipients (treatment group)
- 19.0% open rate
- 1.3% click rate

- Sent 10/15/13 to 95,295 recipients (non-treatment group)
- 18.1% open rate
- 2.2% click rate

- Sent 10/23/13 to 23,924 recipients (treatment group)
- 20.4% open rate
- 2.4% click rate

- Sent 10/24/13 to 91,151 recipients (non-treatment group)
- 18.8% open rate
- 2.6% click rate

C3 Energy PPT presentation, slide 18

Acquisition Email: November 2013

- Sent 11/19/13 to 24,426 recipients (treatment group)
- Delivered to 23,539 recipients
- 10.4% open rate (2,444 users)
- 0.8% click rate (181 users)

- Sent 11/19/13 to 90,791 recipients (non-treatment group)
- 16.9% open rate
- 1.5% click rate

- Sent 11/25/13 to 24,310 recipients (treatment group)
- Delivered to 23,639 recipients
- 16.9% open rate (3,997 users)
- 1.5% click rate (347 users)

- Sent 11/25/13 to 94,387 recipients (non-treatment group)
- 16.3% open rate
- 1.8% click rate

C3 Energy PPT presentation, slide 19

Acquisition Email: December 2013

- Sent 12/12/13 to 24,701 recipients (treatment group)
- Delivered to 23,241 recipients
- 17.6% open rate (4,088 users)
- 2.0% click rate (468 users)

- Sent 12/18/13 to 23,667 recipients (treatment group)
- Delivered to 22,797 recipients
- 11.5% open rate (2,619 users)
- 0.9% click rate (213 users)

- Sent 12/18/13 to 92,103 recipients (non-treatment group)
- Delivered to 89,342 recipients
- 13.1% open rate (11,701 users)
- 1.2% click rate (1,086 users)

C3 Energy PPT presentation, slide 20

Unlinked Account Email: December 2013

- Sent 12/23/13 to 2,855 recipients
- Delivered to 2,696 recipients
- 29.2% open rate (787 users)
- 10.2% click rate (267 users)

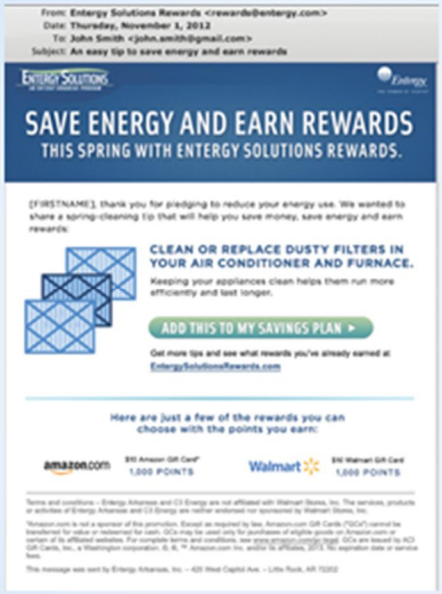
C3 Energy PPT presentation, slide 21

Energy Saving Tip Email: February 2013

- Sent 2/19/13 to 5,788 recipients
- 33.9% open rate
- 6.5% click rate

C3 Energy PPT presentation, slide 22

Energy Saving Tip Email: April 2013



- Sent 4/26/13 to 5,579 recipients
- 22.2% open rate
- 7.4% click rate

C3 Energy PPT presentation, slide 23

Energy Saving Tip Email: June 2013

- Sent 6/11/13 to 6,397 recipients
- Open Rate: 29.2%
- Click Rate: 10.3%

C3 Energy PPT presentation, slide 24

Energy Saving Tip Email: June 2013

- Sent 6/27/13 to 6,808 users
- Delivered to 6,222 users
- Open Rate: 28.9% (1,796 users)
- Click Rate: 8.8% (545 users)

C3 Energy PPT presentation, slide 25

Energy Saving Tip Email: July 2013

- Sent 7/24/13 to 6,842 users
- Delivered to 6,490 users
- Open Rate: 30.7% (1,990 users)
- Click Rate: 9.9% (640 users)

C3 Energy PPT presentation, slide 26

"Welcome to Version 2.0" Email: September 2013

- Sent 9/05/13 to 7,314 online users
- Delivered to 6,856 online users
- Open Rate: 35.9% (2.458 users)
- Click Rate: 10.4% (710 users)

C3 Energy PPT presentation, slide 27

Energy Saving Tip Email: September 2013

- Sent 9/11/13 to 7,270 users
- Delivered to 6,831 users
- Open Rate: 29.7% (2,032 users)
- Click Rate: 5.4% (372 users)

C3 Energy PPT presentation, slide 28

Energy Saving Tip Email: October 2013

- Sent 10/10/13 to 7,464 users
- Delivered to 7,298 users
- Open Rate: 25.8% (1,882 users)
- Click Rate: 6.4% (470 users)

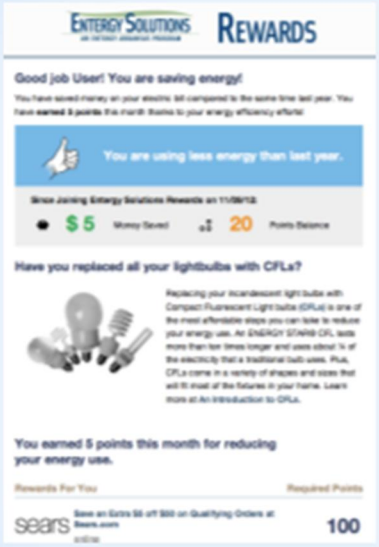
C3 Energy PPT presentation, slide 29

Energy Saving Tip Email: December 2013

- Sent 12/12/13 to 12,405 users
- Delivered to 12,071 users
- Open Rate: 28.4% (3,434 users)
- Click Rate: 6.3% (755 users)

C3 Energy PPT presentation, slide 30

Bill Feedback Email (Sample)

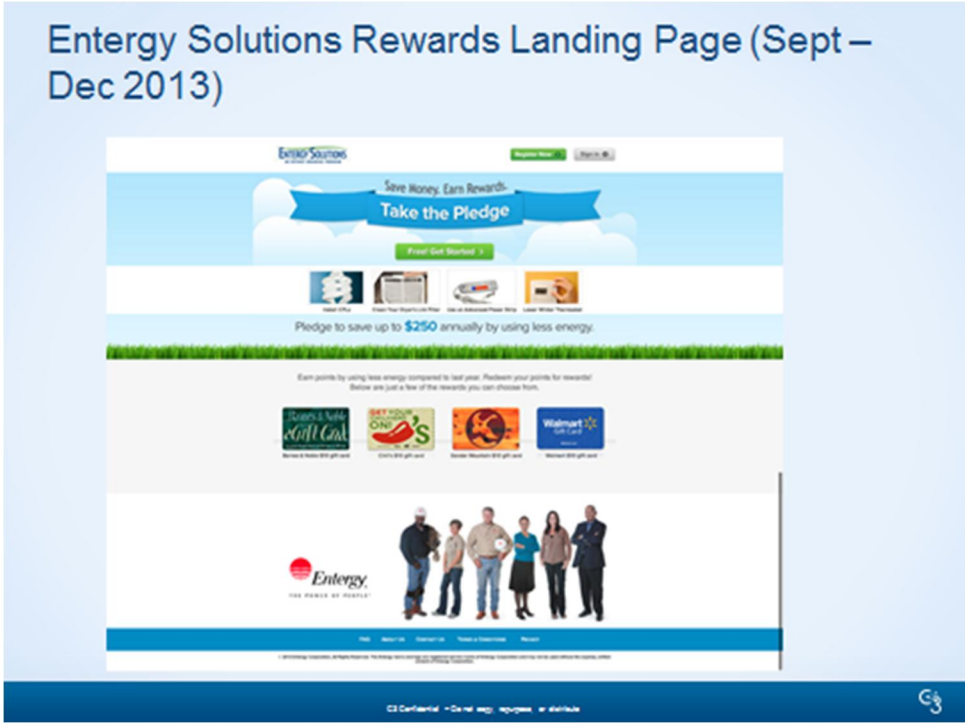


- Sent monthly to all online/linked users

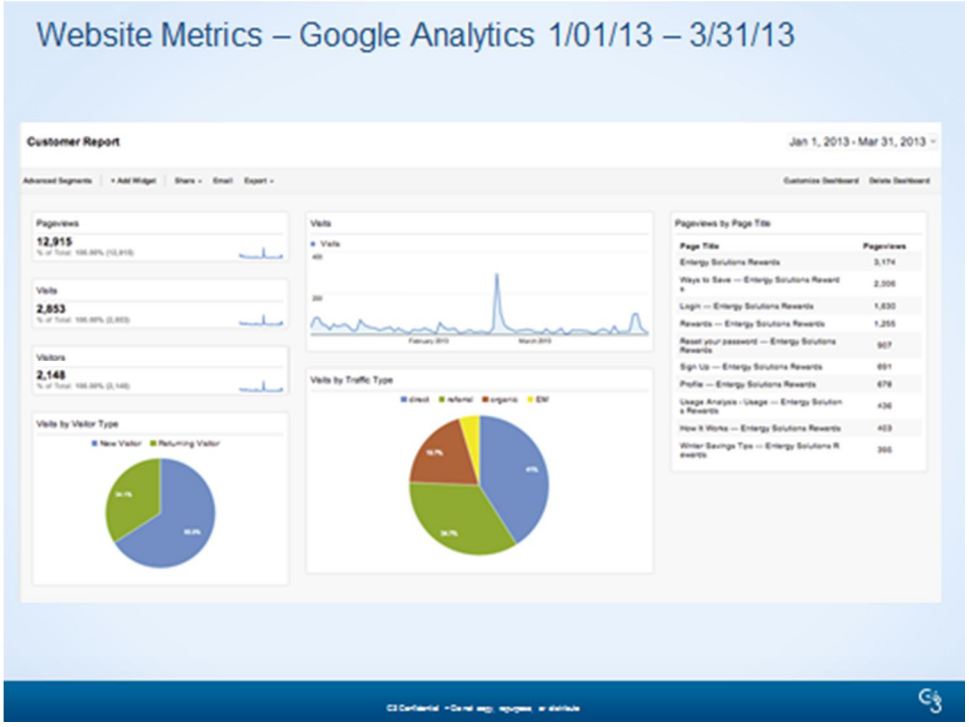
C3 Energy PPT presentation, slide 31

C3 Energy PPT presentation, slide 32

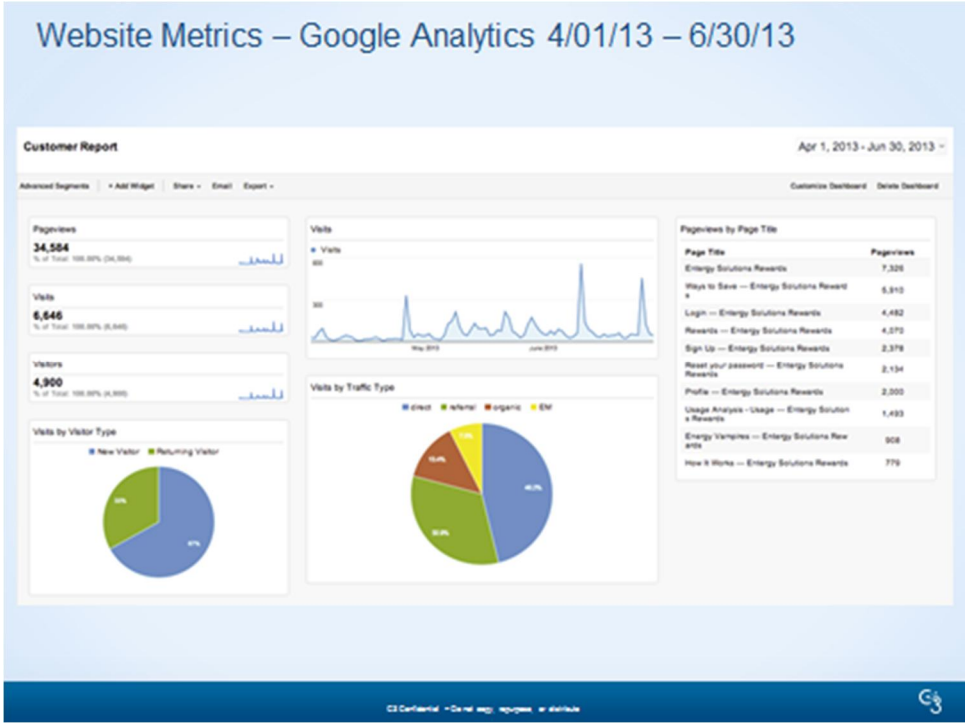
C3 Energy PPT presentation, slide 33



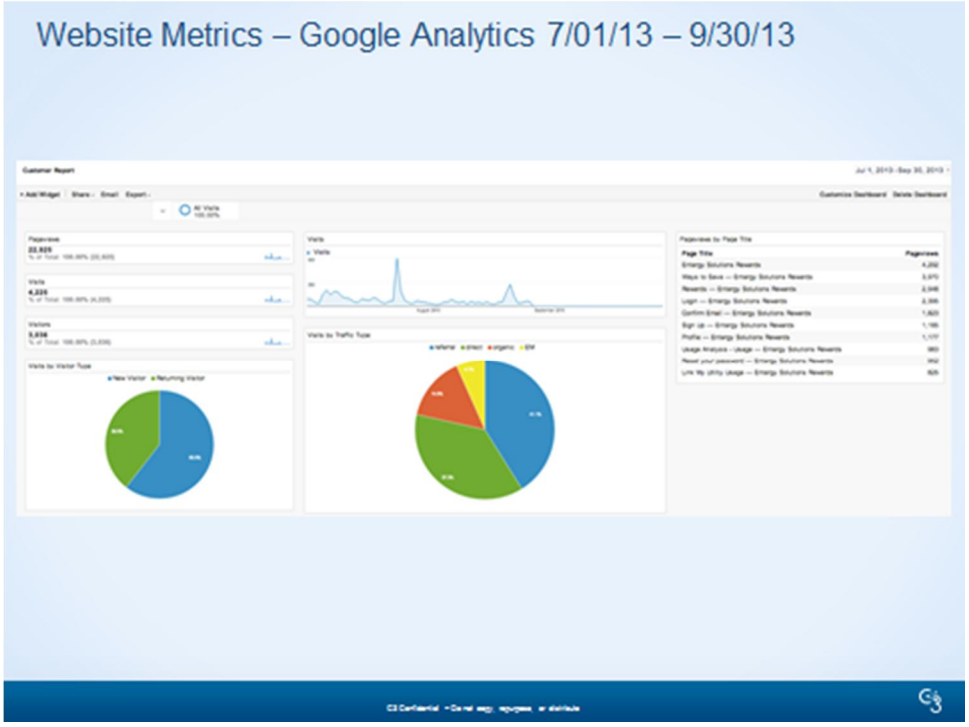
C3 Energy PPT presentation, slide 34



C3 Energy PPT presentation, slide 35



C3 Energy PPT presentation, slide 36



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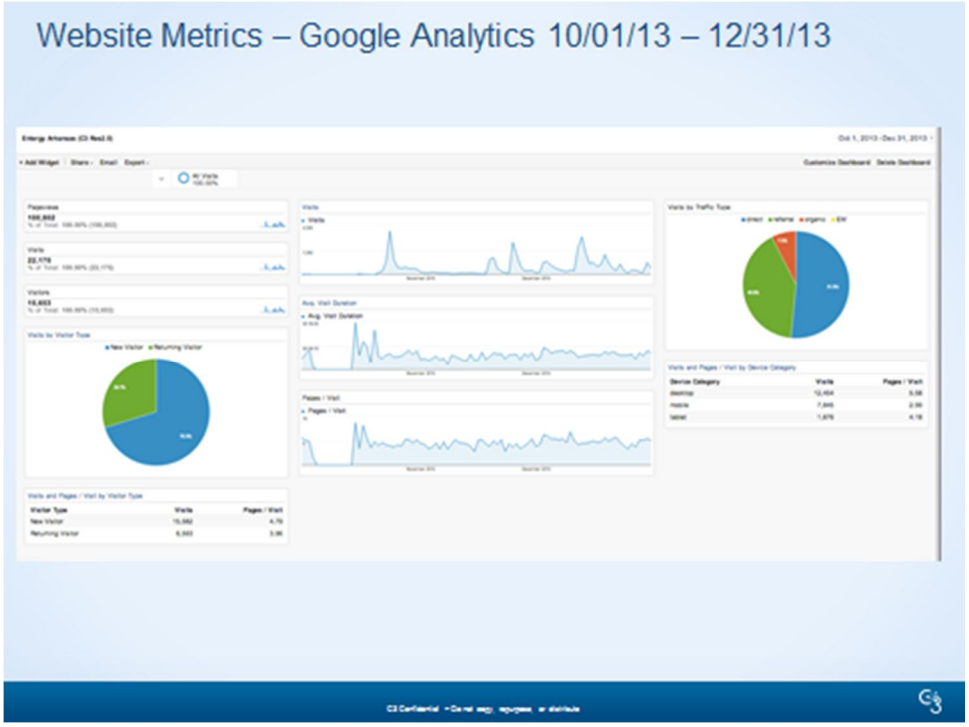
C3 Energy PPT presentation, slide 37



2.15 Summer Advantage

Summer Advantage Reactivation Letter

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Welcome to the neighborhood ...

and an easy way to save money and energy with the Entergy Arkansas Summer Advantage Program.

Congratulations on your new home. We hope you've begun to settle in.

Now might be a good time to think about saving money on your electricity costs and doing something important for your new community.

The Entergy Arkansas Summer Advantage Program works to stabilize electricity demand and supply during the summer, when thousands of central air conditioners and heat pumps turn on at the same time. The program pays you for your help in keeping the power flowing to everyone.

On the hottest summer weekdays, the program engages for a few hours on select afternoons. As a participant, you allow us to automatically "cycle" your cooling equipment during these times, helping to reduce electricity demand when it counts most. The enclosed *How It Works* brochure explains it all.

There's no charge to participate. The Summer Advantage Program works automatically once you enroll. The program is similar to others throughout the U.S. with 95% customer satisfaction rates.

Sign up now and join over 12,000 Entergy Arkansas households that are making our area a better place to live.

To join, complete and mail the enclosed postage-paid reply card, visit entergyarkansas.com/summer advantage or call 866-224-7812.

Entergy.
THE POWER OF PEOPLE

A message from Entergy Arkansas, Inc. ©2010 Entergy Services, Inc. All Rights Reserved.

How much do you want to save?

$50 50% Cycling Option– **Best for Your Comfort**

Your air conditioner compressor operates 50% of the time that it did in the hour prior to the conservation period. Most participating at this level report they don't notice a difference.

Receive a total of $50 the first year.
- A one-time $25 Installation Check.
- An annual $25 Thank-you Check.

OR

$80 75% Cycling Option– **Best for Your Community**

Your air conditioner compressor operates 25% of the time that it did in the hour prior to the conservation period. This option is best for those who aren't home during the day.

Receive a total of $80 the first year.
- A one-time $40 Installation Check.
- An annual $40 Thank-you Check.

Summer Advantage Reactivation Letter, Reverse

Make a Difference for Arkansas.

Why Join?

Your participation affects everyone in the Entergy Arkansas area because Summer Advantage helps:

- Keep our power supply steady.
- Maintain current electricity prices.
- Further reduce carbon emissions that contribute to global warming.

Frequently Asked Questions

How does Summer Advantage work?

When you enroll in Summer Advantage, we'll connect a device called a digital cycling unit on or near your central air conditioning unit or heat pump. It receives a signal during a conservation period to turn your unit's compressor on and off for a few minutes each half-hour during the hottest summer weekday afternoons – from June 1 through September 30 (excluding holidays) – when demand for electricity is high.

How often will the program be activated?

Summer Advantage typically operates on the hottest weekdays, for a small block of time from 12 - 7 p.m. CST, June 1 through Sept. 30. The program will not be activated on holidays or weekends unless there is an unexpected critical need. An event will last no more than four hours and on no more than three consecutive days.

Will my comfort level be affected during activation?

While your compressor is in conservation mode, your unit's fan continues to circulate the cool air throughout your home. During this time, the temperature may rise a few degrees but, if you're like most customers in similar programs, it's unlikely you'll notice the change.

Do I need to be available when the DCU is installed?

The DCU will be installed on or near your outdoor central air conditioning unit or heat pump, so it is not necessary for you to be present at that time. Just be sure your central air conditioning unit or heat pump and safety disconnect switch are accessible to the technician. If you prefer to be present, you can schedule an appointment with us.

Can I switch my participation level after signing up for Summer Advantage?

Yes. Summer Advantage has been designed to meet your changing needs. During your first year of participation, you will be permitted to switch your cycling level twice (2x). In subsequent years, you will be permitted to change your level of commitment once (1x) annually. You will not be able to receive a higher installation amount and you will receive a prorated payment amount for the program months you were active.

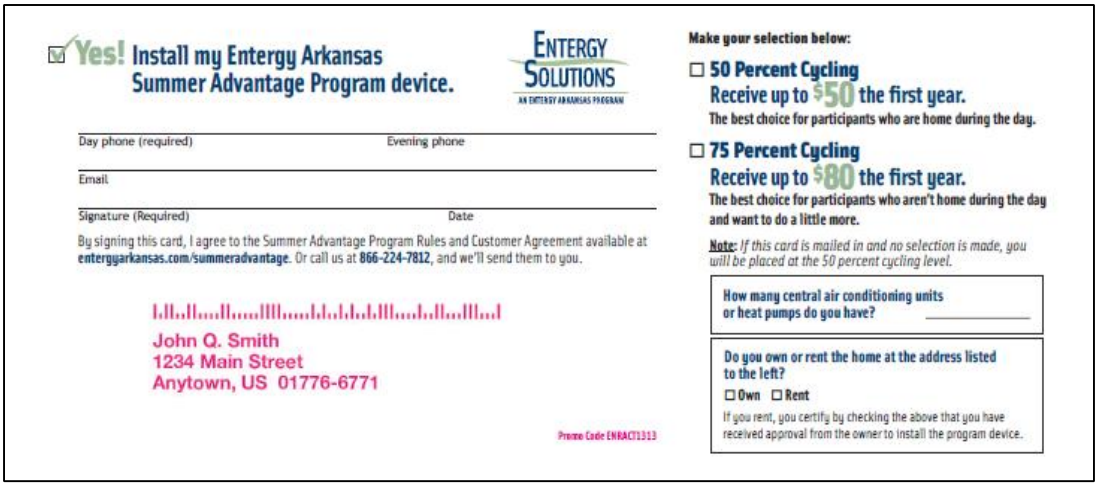
Am I permitted to "opt out" of a conservation period?

All customers are permitted to opt out of up to two emergency conservation periods per season. Participants who wish to override a conservation period will need to call our Summer Advantage experts at 866-224-7832 from the hours of 8 a.m.-6 p.m. CST.

For more information, visit energyarkansas.com/summeradvantage.

Summer Advantage Reactivation Letter, Envelope

Summer Advantage Reactivation Letter, Reply Card



Summer Advantage Reactivation Letter, Reply Card, Reverse

Summer Advantage Direct Mailer

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Money for you. Energy for all of us.

As we move into the cooler seasons, air conditioning may be the last thing on your mind. But it can really pay to think about it now—and the **Entergy Arkansas Summer Advantage Program.**

Summer means a steep rise in consumer and commercial demand for electricity. Tens of thousands of central air conditioners turn on at the same time, challenging the energy supply. **Summer Advantage** pays you to help stabilize this balance, keep the power flowing to everyone, and a whole lot more.

At no charge, we install an outdoor switch near your central air conditioner or heat pump. The program then engages for a few hours on a few select summer afternoons. By allowing us to automatically "cycle" your cooling equipment during these times, you help to reduce electricity demand when it counts most. **And you get paid to do it!**

Decide based on your lifestyle how much your air conditioner is cycled during a conservation period, and how much money you want to save, and we'll do the rest.

Important Facts About Your Comfort

- Similar programs have a **95% customer satisfaction rate.**
- Your air conditioner's fan will continue to run and circulate cool air throughout your home during a conservation period.
- On average, your temperature will only increase a few degrees during a conservation period.

So, how much do YOU want to save?

$50 50% Cycling Option—
Best for Your Comfort

Your air conditioner compressor operates 50% of the time than it did in the hour prior to the conservation period.

Most participating at this level report they don't notice a difference.

- **Receive a one-time $25 Installation Check and an annual $25 Thank-you Check.**

$80 75% Cycling Option—
Best for Your Community

Your air conditioner compressor operates 25% of the time than it did in the hour prior to the conservation period.

This option is best for those who aren't home during the day.

- **Receive a one-time $40 Installation Check and an annual $40 Thank-you Check.**

Sign up now

and enjoy your Installation Check shortly after the program device is installed!

Simply complete and mail the enclosed **postage-paid reply card,** call **866-224-7812,** or visit **entergyarkansas.com/summeradvantage** where you'll also find full program details.

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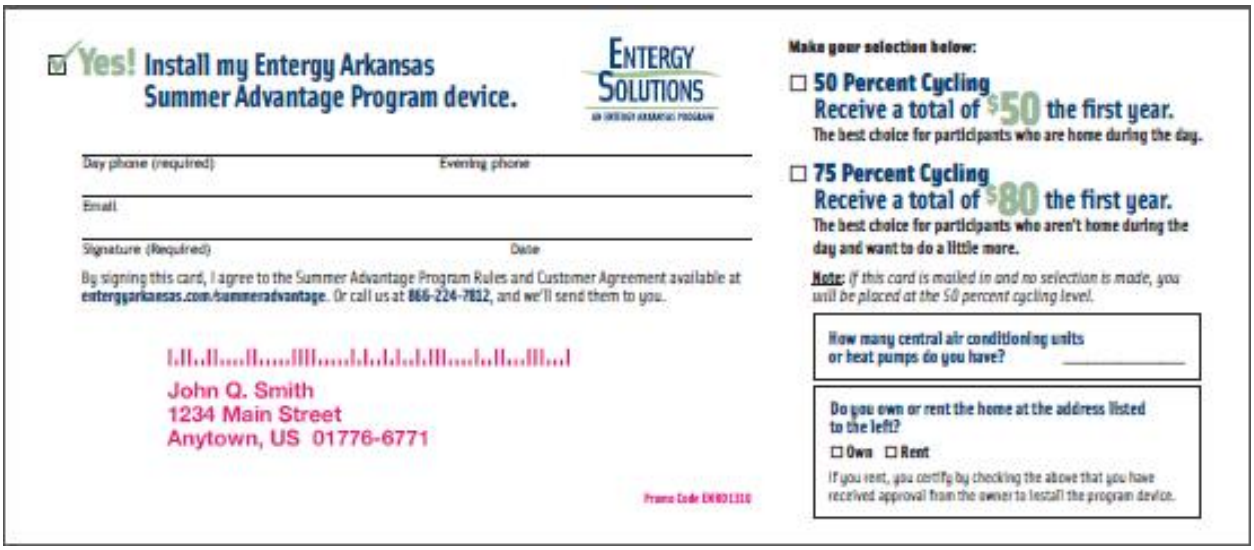
Summer Advantage Direct Mailer, Envelope

Summer Advantage Direct Mailer, Reply Card



Summer Advantage Corporate Web Page Banner

Summer Advantage Corporate Web Page Banner, 2

Summer Advantage Corporate Web Page Banner, 3

Summer Advantage EMail

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ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Money for you. Energy for all of us.

As we move into the cooler seasons, air conditioning may be the last thing on your mind. But it can really pay to think about it now – and the Entergy Arkansas Summer Advantage Program.

Summer means a steep rise in consumer and commercial demand for electricity. Tens of thousands of central air conditioners turn on at the same time, challenging the energy supply. Summer Advantage pays you to help stabilize this balance, keep the power flowing to everyone, and a whole lot more.

▶ Click to LEARN more about Summer Advantage!

Decide based on your lifestyle how much your air conditioner is cycled during a conservation period, and how much money you want to save, and we'll do the rest.

So, how much do YOU want to save?

$50 50% Cycling Option – Best for your Comfort	$80 75% Cycling Option – Best for your Community
▶ ENROLL TODAY!	▶ ENROLL TODAY!
Receive a one-time $25 Installation Check and an annual $25 Thank-you Check.	Receive a one-time $40 Installation Check and an annual $40 Thank-you Check.

Sign up now

and enjoy your Installation Check shortly after the program device is installed!

Simply visit entergyarkansas.com/summeradvantage or call 866-224-7812.

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This email was sent to [EMAIL].
If you do not wish to receive email communications related to Summer Advantage, please click here.

Converge Arkansas | 8020A Counts Massie Road | North Little Rock, AR 72113
Entergy Arkansas, Inc. | P.O. BOX 551 | Little Rock, AR 72203

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2.16 Agricultural Energy Solutions

AES Program Manual

Entergy Arkansas, Inc.

2013 Agricultural Energy Solutions Program Manual

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Prepared by:

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Entergy Arkansas 2013 Agricultural Energy Solutions Program Manual

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Program Overview

Program Description

The Entergy Arkansas, Inc. , Agricultural Energy Solutions Program is available to all non-residential electric customers on agriculture rate schedules. The program is designed to help farms and other agricultural customers make their property more energy-efficient by offering farm audits, prescriptive and custom incentives and education of suppliers of agricultural equipment.

More than 40 percent of Arkansas' total land area is farmland. The agriculture sector contributes approximately 12 percent of the state's GDP, making it the largest industry in Arkansas. Changes in energy prices affect the agriculture sector both through direct energy consumption as well as through energy-related products such as fertilizer. Thus, finding ways to reduce agricultural dependence on energy is important not only on an individual level, but also at a state level.

The program's goal is to produce long-term, cost-effective electric savings in the agricultural sector in part by offering incentives structured to cover a portion of the customer's cost of installing energy efficiency measures. Customers have two options in the program:

Prescriptive: a simplified method to make efficient choices based on a list of pre-defined energy efficiency measures.

Custom: A more comprehensive and customized approach for farmers who have energy efficiency needs beyond one or two measures on the pre-defined measure list.

The prescriptive option offers a simple way for farm customers to make efficient choices on pre-defined energy efficiency lighting measures without requiring complex analysis or participation rules. Incentives and claimed savings are based on pre-defined technologies and calculation methods. The custom component supports customers in identifying and implementing more complex site-specific opportunities through measures not addressed by the prescriptive option. The program provides incentives and technical assistance to customers seeking to improve the efficiency of existing facilities as well as the efficiency of new equipment purchases, facility modernization and new construction.

Program Objectives

The EAI Agricultural Energy Solutions Program is designed to drive cost-effective energy efficiency in the marketplace, while minimizing the impact of barriers to your implementation of energy efficiency. The program is designed to overcome barriers to the implementation of energy efficiency projects by utilizing a streamlined process that leverages cash incentives for implementing cost-effective projects under the program.

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These barriers include:

- Lack of customer awareness of energy efficiency technologies, benefits and project payback.
- Limited resources to identify energy efficiency opportunities.
- Limited access to financial capital.
- Absence of tools to quantify energy savings.
- Limited availability of energy efficiency technologies.

Program Roles

Customer Roles and Requirements:

- Submit a completed prescriptive or custom application.
- Once projects are preapproved by EAI, make best efforts to fund, install and report projects before the end of the program year.
- Contact the program implementer when projects are completed to schedule a post- inspection.
- Submit a signed application and detailed invoices.
- Receive payment processing letter and, within 6-8 weeks following, incentive payment.

Trade Ally Roles and Requirements:

- Provide verification of current licenses and insurance requirements.
- Perform all work to the required standards of the program.
- Install eligible energy efficiency measures and submit appropriate documentation requested by the program implementer.

Program Eligibility

Customer Eligibility

Any agricultural customer that receives electric service from EAI is eligible for the Agricultural Solutions Program at their facilities receiving electric service from EAI.

The following rate codes are eligible:

- Agricultural Pumping (AP).
- General Farm Service (GFS).
- Small General Service (SGS).
- Large General Service (LGS).

For purposes of this program, a customer is defined by a single Federal Tax ID number. Organizations with multiple locations are considered a single customer, regardless of how many EAI account numbers they may have.

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The EAI team will support farm customers and their trade allies throughout the decision and installation process. While recognizing that some farm customers may choose not to use a trade ally at all, for those who do, EAI will help to facilitate the communication between customers and trade allies that can address the customers' needs. Through this program, agricultural customers will have access to a variety of resources including an educated trade ally and equipment supply network, educational tools to help them identify and prioritize cost effective savings opportunities and access to program experts who will offer guidance throughout the participation process.

Trade Ally Eligibility

The program offers a flexible approach to participation and allows customers to select their contractor to perform the work.

Prescriptive Equipment Eligibility

The Prescriptive program consists of pre-determined energy-efficient lighting and control incentives. When a customer submits a project, no detailed engineering analysis is required. The program already has the savings and cost effectiveness of each measure built in, and therefore offers an incentive on a $/unit basis. For example, lighting incentives may offer $25/fixture or $50/occupancy control.

All equipment must meet the technical requirements as listed on the application forms for each specific program. In addition, all equipment must be new; used or refurbished equipment is not eligible. Existing equipment being replaced by new equipment must be removed and disposed of in accordance with all federal, state and local codes. Customers may not re-install any equipment that has been removed in the EAI territory or transferred to any other party for installation.

Custom Equipment Eligibility

The Custom program covers cost-effective measures that are not included under the Prescriptive program. Site-specific engineering and cost analysis may be required for each project submitted. The proposed project or equipment must have verifiable electric energy savings and pass the program cost effectiveness criteria. The Custom program only approves projects, not overall technologies. So while a specific custom measure is approved under one project, it does not guarantee that that same technology will be approved on any other project.

Typical Custom measures include, but are not limited to:

- Low-energy livestock waterers.
- Exhaust fans.
- Circulation fans.
- High volume low speed fans.
- Milk pre-coolers.
- Variable speed controllers.
- Scroll compressor replacements.
- Variable frequency drives.
- Light-emitting diode (LED).

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All Custom measures require supporting documentation on equipment performance and calculations documenting the energy and demand savings that are expected to result from each measure. This information typically includes performance data for the existing or base case equipment and the energy efficiency equipment proposed as well as the operating load profiles that the equipment operates under. Please refer to the Custom Application Form for details on the required supporting documentation for each measure.

Program Incentives

Qualifying agribusiness customers can receive cash incentives for installing qualifying energy efficiency measures by choosing from a list of predetermined prescriptive lighting measures or by tailoring a custom project specific to their operation.

No single participant designated by an individual Federal Tax ID may receive more than 20 percent of the annual incentive budget. In the event that there are incentives funds still available after September 1 of the current program year, a participant may exceed the 20 percent cap in order to fully subscribe the program upon approval by the program implementer. The completion date of all projects should not extend beyond November 30 of the current program year, unless approved in writing by the program implementer.

Prescriptive Incentive Basis

The Prescriptive per-unit incentive basis is a user-friendly menu-based approach with predetermined savings and incentive levels. To establish per-unit energy savings, the cost of the equipment and engineering estimates are evaluated. The table below highlights the two main categories for prescriptive incentives:

Measure	Measure Description
Lighting	Retrofit lighting projects that replace existing lighting systems with more efficient lighting. There are a variety of lamp, ballast and fixture combinations that are eligible for this program dependent upon existing conditions.
Lighting Controls	A variety of lighting controls incentives are available. These controls save energy by turning the lights off when a space is unoccupied. These incentives are not available for some new construction or major renovation projects.

Custom Incentive Basis

Custom application incentives are determined on a case-by-case basis. In general, incentives received through this program are based on a project's reduction in energy consumption and the EAI cost effectiveness analysis. For all custom measures, incentive will be based at a rate of $0.17/kWh saved.

8.50 x 11.00 in

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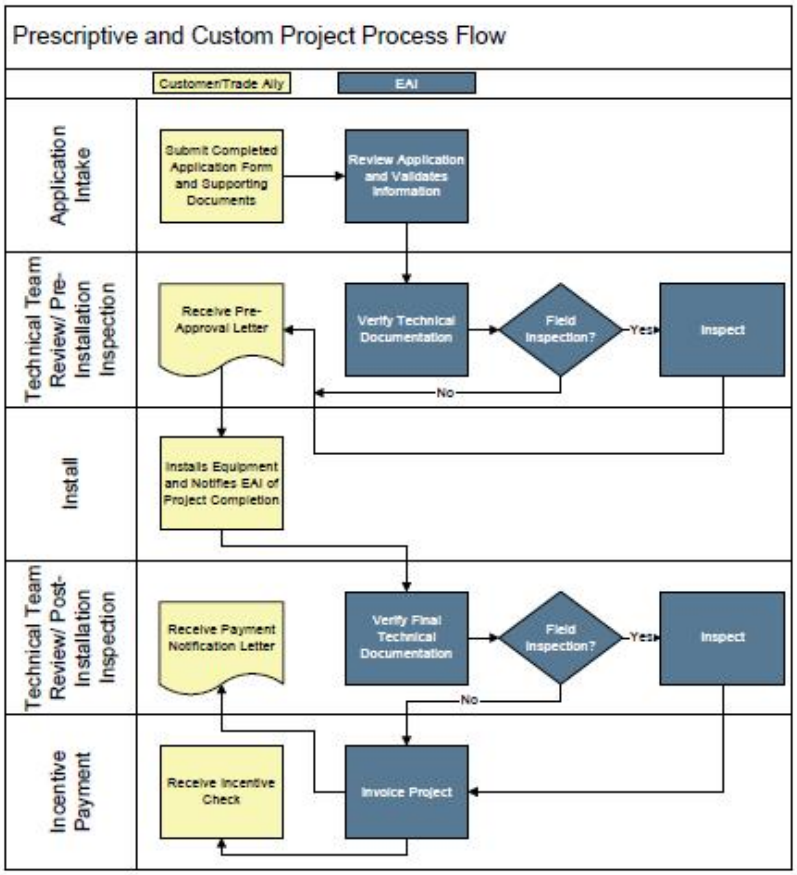
Program Application Process

The following diagram highlights the various steps in the application process followed by a description of what to expect during each step.



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Application Intake

The application process is relatively simple for the customer and contractor, with the EAI team performing support functions as needed and processing applications in a transparent manner. Once a customer expresses interest in participating in the program, a program representative will work closely with the customer to help them navigate the participation process.

When an application is received, the program uses a detailed process to review and track the application throughout the project life cycle, from intake to completion.

Applications can be submitted by the following methods:

- Emailed to: AgriculturalEAI@icfi.com
- Faxed to: 501-325-0443

Application Processing

All applications require preapproval from EAI before purchasing and installing any energy-efficient equipment. Customers or trade allies must submit a complete package containing:

- Completed application- signed by the customer.
- IRS – Form W-9 for customer receiving incentive.
- For Prescriptive: Excel Lighting Worksheet.
- For Custom: Detailed engineering analysis showing energy calculations, cost analysis of proposed equipment and baseline equipment for replacement projects.
- All equipment specification sheets demonstrating program requirements are met.

Once the application is sent to EAI, the technical review process begins. If there are questions regarding program eligibility, an EAI representative will contact the individuals listed on the application. If a project passes the review process, a preapproval letter will be mailed to the customer and emailed to the trade ally, reserving the funds through November 30 of the current program year. If the program is oversubscribed, applications will be placed on a wait list, in the order in which the applications are received. Participants on the wait list may be able to reserve the incentive funding for the current program year if projects are cancelled and funds become available.

Technical Review

Once a completed application has been submitted, EAI begins the technical review process. To do so, EAI reviews the supporting documentation including all equipment specifications required to prove eligibility. Lighting projects require an Electronic Lighting Worksheet that provides a detailed lighting inventory of the entire project.

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If any concerns arise, the EAI technical reviewer will contact the trade ally or customer. All documentation must be accurate and thorough to be pre-approved. The typical Technical Review process takes two to three weeks for Prescriptive and three to four weeks for Custom applications. Once the technical review is completed, EAI may request a pre-inspection.

Pre-Inspections

The pre-installation inspection of measures establishes a baseline from which the incentive is calculated. During the pre-installation inspection, the existing conditions at the customer's facility, operating characteristics of the equipment and applicability of all assumptions that factor into the energy savings calculations are verified. A pre-inspection also ensures that the equipment being replaced is consistent with the application, that the quantities of measures are accurate and that the appropriate documentation is in place. Depending on the pre-inspection results, program representatives and customers can make necessary adjustments to the application. Once the existing conditions are verified, the proper incentive can be determined for pre-approval.

Installation

After the customer has received the pre-approval letter for either a Prescriptive or Custom application, the customer may complete the retrofit, renovation or construction project listed in the application. The customer or trade ally is responsible for notifying EAI when the project has been completed. Please be advised that the pre-approval reserves the program funds through November 30 of the current program year.

Notification emails to the general program inbox that alert project completion should include:

- Any changes made to project scope.
- Final invoices.
- Signed (by customer) application, verifying equipment has been installed as listed on the application.

Please note EAI must receive final project notification of completion prior to November 30 of the current program year.

Post Inspection

If it is determined that a post-inspection will be performed, a program representative will contact the customer or trade ally to set up the site inspection. The goal is to confirm the installed equipment, quantity and operating hours, along with any other technology-specific verification that must be performed.

Incentive Payments

Once the final technical review and post-inspection (if required) are complete, the project is ready for final project approval and payment processing. As with the pre-approval process, EAI will email a letter confirming the payment processing, and that the incentive check will arrive in six to eight weeks. EAI must release all incentives payments prior to December 30 of the current program year.

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Quality Management Systems

Quality Assurance

To increase the overall quality of the program, quarterly trade ally training courses will be provided for trade allies servicing agricultural customers. The focus of these training courses is to ensure that participating trade allies are knowledgeable of all program details and processes as well as to help position their companies to promote the Agricultural Energy Solutions Program. Most training sessions will offer a choice of a morning or an afternoon session, each in duration of two hours. Sign-in sheets will record attendees and be kept on file, along with evaluations filled out by the attendees. Business cards will also be collected, scanned and kept on file.

Quality Control

Upon receipt, all application forms go through a quality control review for eligibility, completeness and accuracy. For Prescriptive projects, details are such as the quantities and specifications of the measures being installed to verify eligibility and potential incentive amounts are confirmed. For Custom projects, a more in-depth review is completed by the technical reviewer to ensure technical eligibly is met and to verify the accuracy of energy savings estimates.

In addition to these reviews, all projects are subject to on-site inspections to confirm pre-existing and installed measures and operating conditions. Pre-and post-inspections will be selected on a random basis. Typically, it will consist of 10 percent of the qualifying measures. If your project fails its inspection, additional inspections will be conducted in an attempt to determine whether there is reasonable assurance that the project has been documented and that the actual savings can be verified. In connection with any such inspection, adjustments to the application may be required for completion and submission to EAI. Depending on the discrepancies found, the incentive amount may increase or decrease.

Participant Communications

Once a participant submits an application for an incentive, a program representative will become the main point of contact for all communications. The program representative will be in regular contact with participants throughout the process. In addition, written communications will be mailed to the participant to document key milestones such as:

- Pre-approval letter confirming that the project has been approved and incentives have been reserved.
- Missing information letter if any information required to evaluate the project is missing.
- Payment notification letter notifying the customer that the application process is complete and the request for payment has been initiated.

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Disclaimer

The selection of a participating contractor to perform work is the sole decision of the property owner, customer, and/or authorized lessee/occupant. Inclusion of a contractor in the participating trade ally list for the program does not constitute an endorsement by EAI, Inc. or ICF International of any product, individual, or company.

Neither EAI, Inc. nor ICF International makes any guarantee or any other representation or warranty, expressed or implied, as to the quality, cost or effectiveness of any product(s) provided or work(s) performed by any participating Contractor or by any such participating contractors' employees, subcontractors or suppliers.

Energy efficiency gains are subject to a number of variable conditions and circumstances. While it is the program's intent to achieve energy savings, neither EAI, Inc. nor ICF International guarantees or warrants that any specific energy efficiency gains will be achieved for a particular customer participating in the program.

Trade Ally Offering

EAI is pleased to partner with local trade allies to promote energy efficiency services to business customers through the Agricultural Energy Solutions Program. Trade allies help raise awareness of the program and inform customers about the opportunities and incentives available. This audience not only possesses the capability of driving end-users to become first-time program participants, but can also encourage existing participants to assume a greater degree of involvement.

Participating Trade Allies in the Agricultural Energy Solutions program include contractors, architects and engineers; energy service companies and distributors, manufacturer representatives and other companies who offer relevant services. This includes services related to fans, variable frequency drives, pumps, tractor heat timers, lighting, irrigation or any other related agricultural service.

Interface between customers, trade allies and the program is primarily carried out by program representatives. Program representatives will also outreach, educate, recruit and maintain regular contact with program participants. Program representatives work closely with local trade and professional associations (for end-users and product providers) to make them aware of the program.

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Frequently Asked Questions

Q: Who is ICF International and why are they involved?
ICF International (ICF) is an energy consulting company that was selected through a competitive bidding process by EAI to implement the Agricultural Energy Solutions Program. ICF International has extensive experience managing similar programs throughout the country. ICF has a local office in Little Rock.

Q: Are incentives available for gas-consuming devices?
Currently, there are no incentives available for industrial and commercial gas applications.

Q: Will the program change from year to year?
The program was designed using a best practices approach from utilities across the country. However, programs are reviewed periodically and it is possible for programmatic processes or elements, including incentives, to change from year to year.

Q: Who can participate in the program?
Non-residential customers who receive electric distribution service through the EAI regardless of their electric or gas supplier.

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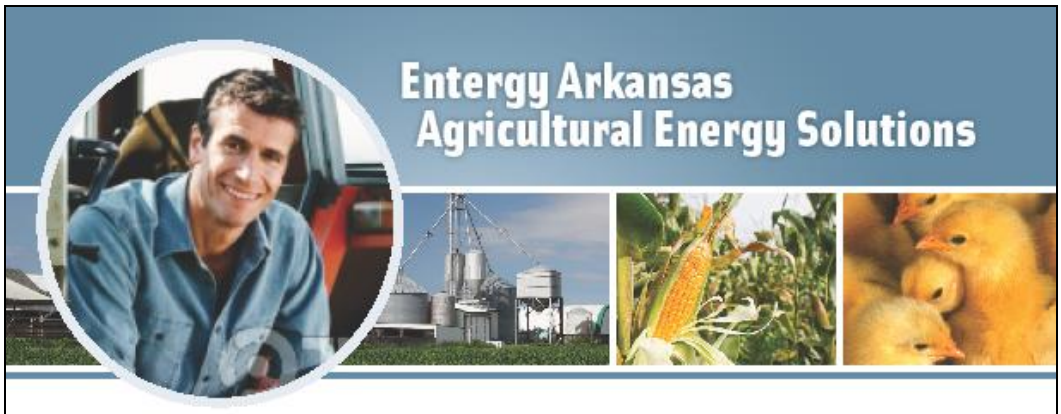
AES Program Overview



Save Energy, Increase Your Profits.

It's a competitive marketplace – more than 40 percent of Arkansas is farmland, which means agribusinesses of all sizes need to make every dollar count. Making your facilities more energy-efficient is a simple and effective way to reduce energy costs and boost productivity.

Entergy Arkansas, Inc. has developed an Agricultural Energy Solutions Program that provides financial incentives and technical assistance to help your agribusiness replace aging, inefficient equipment and systems with new, energy-efficient technologies. The program is designed to maximize your savings through increased energy efficiency and better managed energy costs.

This special opportunity offers you a variety of options to help you build energy efficiency into every project, whether you are retrofitting existing inefficient equipment, purchasing new equipment, replacing equipment at the end of its lifespan, conducting major renovations or constructing a new facility.

Agricultural Energy Solutions Offers:

- **Financial incentives** to reduce the upfront cost of energy efficiency improvements.
- **Technical service** to provide you guidance on energy efficiency opportunities.
- **Flexibility** by allowing customers to engage their own qualified contractor or the use of in-house staff.

Benefits for Your Business

- Energy-efficient technologies reduce your energy use and minimize costs.
- Investments in energy efficiency can offer a fast return on investment, often paying for themselves in less than two years.
- Energy-efficient equipment can streamline operations, enhancing workplace productivity and improving employee comfort.

ENTERGY SOLUTIONS

Ready to Get Started?

Learn more about the Agricultural Energy Solutions Program and how it can benefit your business by visiting us online at **entergyarkansas.com**, calling us at **501-244-9570** or by emailing us at **entergysolutions@icfi.com**.

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AES Program Overview, Reverse

A Solution that Fits

The program's goal is to produce long-term, cost-effective electric savings for agribusinesses by offering incentives structured to cover a portion of the cost of installing energy efficiency measures. Participating Entergy Arkansas agribusiness customers have two options for participating in the program.

1. Prescriptive Option

The prescriptive approach offers a simple method to make efficient choices by offering predetermined incentives for a wide selection of common energy-efficient lighting measures, including:

- Compact Fluorescent Light Bulbs.
- High-performance linear fluorescent replacements.
- Pulse-start metal halide.
- Occupancy controls.

2. Custom Option

The custom approach offers incentives for more complex and site-specific, cost-effective opportunities for energy-efficient technologies or multi-measure projects that are not included in the prescriptive offerings. Custom projects must be able to show specific and verifiable energy savings and costs. Typical custom measures include, but are not limited to, the following:

- Low-energy livestock waterers.
- Exhaust fans.
- Circulation fans.
- High-volume, low-speed fans.
- Milk pre-cooler.
- Variable speed controllers for vacuum pumps.
- Variable frequency drives.

Eligibility

The Entergy Arkansas Agricultural Energy Solutions Program is available to all non-residential electric customers on agriculture rate schedules Agricultural Pumping, General Farm Service, Small General Service and Large General Service. This program extends to a variety of agribusiness including:

- Poultry.
- Dairy.
- Cattle.
- Delta/Row Crops.
- Aquaculture facilities.
- Equipment.

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AES Custom Application

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Agricultural Energy Solutions Program Custom Application

The Agricultural Energy Solutions Program is [illegible] Entergy Arkansas [illegible] Entergy [illegible] are available for [illegible] energy-saving [illegible] and are based on energy savings of custom projects [illegible] pre-approval [illegible] installation.

1. All applications for incentives must be pre-approved by Entergy Arkansas prior to purchasing and installing equipment. A pre-installation inspection may be required.
2. Upon receipt of [illegible] approval, the Customer [illegible] in project installation. Projects must be completed by [illegible] indicated on the pre-approval letter.
3. [illegible] the Customer shall provide a completed application and explanation of changes prior to making the changes. Incentives will be determined based upon the actual qualified equipment installed. Copies of invoices for all work are required.
4. A post-installation inspection may be required.

Upon final approval of [illegible] Entergy Arkansas will send to the Customer [illegible] within 5-8 weeks.

CUSTOMER/PROJECT INFORMATION (ENTERGY ARKANSAS ACCOUNT HOLDER)

Company Name		Contact Person	Title	
Street Address		Entergy Arkansas Electric Account Number		
City	ZIP	Email	Telephone	
Mailing Address (if different)		City	State	ZIP

☐ Corporation ☐ LLC ☐ Partnership ☐ Individual/Proprietorship ☐ Not for Profit

Farm Type: ☐ Aquaculture ☐ Cattle ☐ Dairy ☐ Cotton/Row Crops ☐ Poultry ☐ Swine ☐ Other	Expected Completion Date

CONTRACTOR INFORMATION

Contractor Company Name	Contact Person	Title	
Street Address	City	State	ZIP
License Number	Email	Telephone	

CUSTOMER ACKNOWLEDGEMENT

Pre-Installation – By signing below, I hereby certify that I have read the [illegible] this application and [illegible] and I have read and agree to the Terms & Conditions on page 4.

Authorized Representative (please print)	Title
Authorized Signature	Date

Post-Installation – By signing below, I hereby certify that I have seen the Energy Efficiency Measures that have been installed and I am satisfied with their [illegible]

Authorized Representative (please print)	Title
Authorized Signature	Date

IRS Form W-9 must be completed for the Customer receiving the incentive payment from Entergy Arkansas. IRS Form W-9 is available at irs.gov.

ADMINISTRATIVE USE ONLY

Date Received	Project Number	Program Rep.
Pre-approved Date	Program Manager	Pre-approved Incentive $
Final Approval Date	Program Manager	Final Incentive $

Agricultural Energy Solutions Custom Application [illegible]

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AES Custom Application, page 2

IMPORTANT INFORMATION FOR CUSTOM APPLICATIONS

1. All applications for incentives under the Custom application require thorough and complete documentation of the proposed cost and projected electric usage and savings.
2. Before beginning the application process, the Customer or their contractor should check with an Entergy Arkansas Representative to determine the eligibility of the proposed project and to establish requirements for detailed savings projections and cost estimates. This information must be submitted to Entergy Arkansas for review and evaluation of potential incentives.
3. If a project consists of multiple Custom measures, the following sections must be completed for each proposed energy conservation measure. These Sections are intended to provide a summary of each individual measure with supporting documentation attached as appropriate.

CUSTOM SPECIFICATIONS

The Custom application must be used for all energy efficiency measures that are not covered by the prescriptive applications. Custom applications require supporting documentation on equipment performance and calculations documenting the energy and demand savings that are expected to result from each measure. This information typically includes performance data for the existing or base case equipment and the energy efficiency equipment proposed as well as the operating load profiles under which the equipment operates.

Supporting documentation for each energy efficiency measure submitted with a Custom application includes:

Project Overview: Provide a brief overview of the proposed project. Include a basic description of the facility and its function, location of affected equipment, and typical facility operation hours.

Existing System or Base Case Description: For retrofit projects, describe the existing system or equipment that will be modified under this application and state how the current system is operating. For new construction or end-of-life replacement projects, applications should provide information for the base-efficiency system or equipment. This should include:

- Detailed description of the affected equipment including system capacity, age, load profiles, capacity, production rate and hours of operation.
- Number of existing units.
- Manufacturer data sheets with equipment performance ratings (BHP, CFM, PSI, kW, Efficiency rating, U-value, etc.). Provide nameplate data if manufacturer data sheets are unavailable.
- Part-load performance data (where applicable).
- Description of controls and sequence of operations.

Proposed System Description: Describe the measures that are proposed in detail. Include:

- Detailed description of high-efficiency system or equipment and operating conditions.
- Manufacturer data sheets for the materials or performance ratings for equipment being installed (BHP, CFM, PSI, kW, Efficiency rating, U-value, etc.).
- Description of controls and sequence of operations.
- One line diagrams (where applicable).

Cost Estimates: For retrofit projects, provide a detailed cost breakdown associated with the project, including written proposals from vendors and contractors or itemized estimates of components from up-to-date estimating manuals. For new construction or end-of-life replacement projects, include cost data for base and high-efficiency systems or equipment.

Energy Impacts: Include a measure-by-measure summary of the calculated energy and demand savings associated with the project. Clearly indicate all assumptions and variables used in the analysis. This includes all engineering formulas and documentation of all the factors, values and assumptions used in the formulas (Microsoft Excel® spreadsheet preferred).

In cases where energy modeling is used to determine savings, approved modeling software must be used. Input and output data from the model must be provided.

Show calculations used to determine baseline and proposed estimated electricity usage including:

- Energy (kWh) consumption for the four time periods.

**Note that no project will be provided incentives that exceed 75 percent of the sum of the incremental measure costs.*

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AES Custom Application, page 3

PROJECT SUMMARY

Attach project study including energy savings information and costs for each energy conservation measure. Briefly describe the project below.

Project Overview

Existing System or Base Case Description

Proposed System Description

COST ESTIMATES

Provide back-up documentation for all material and labor costs, broken down by major pieces of equipment and project components. Sales tax may not be included. Adjust for salvage/resale value of equipment being replaced. Enter summarized costs in the table below.

Measure	Baseline Costs	Proposed Costs
Estimated Material Cost		
Estimated Labor Cost		
Estimated Total Cost		

ENERGY IMPACTS

Please provide estimated annualized energy (kWh) usage and demand (kW) for each of the time periods listed below. Attach full documentation supporting energy and demand estimates. When a computer model is used for energy and demand calculations, please provide a complete description of input conditions for baseline and efficient states in addition to model outputs forboth states.

kWh					Total Percent Energy Savings on Peak
	Summer		Winter		
Peak Energy		kWh		kWh	%
Off-Peak Energy		kWh		kWh	
Total Estimated Annual kWh Savings					kWh

kW	June	July	August	January	December
Average Peak*					

Please complete this application and submit it via one of the following methods:

Email: cody.allen@icfi.com • Fax: 501-325-0443

Contact Account Manager Cody Allen with any questions or concerns: 501-244-9570

APSC FILED Time: 4/1/2014 12:32:02 PM: Recvd 4/1/2014 11:41:33 AM: Docket 07-085-TF-Doc. 443

AES Custom Application, page 4

TERMS AND CONDITIONS

1. **PROGRAM OFFER:** This application covers products purchased and installed after January 1, 2012, and is not retroactive for products purchased or installed prior to this date. Pre-approval is required for all projects.
2. **ELIGIBILITY:** Incentives are available to Entergy Arkansas non-residential customers for the purchase and installation of qualifying energy conservation measures in the Entergy Arkansas service territory, subject to these Terms and Conditions. Entergy Arkansas reserves the right to deny any application that may result in Entergy Arkansas exceeding its program budget. Incentives are offered on a first-come, first-served basis and are subject to project and Customer eligibility and availability of funds. No one participant designated by an individual Federal Tax ID may receive over 20% of the annual incentive budget. In the event that there are incentives funds still available after September 1st of the current program year, a participant may exceed the 20% cap in order to fully subscribe the Program upon approval by the program implementation. The completion date of a Project should not extend beyond November 30th of the current Program year, unless approved in writing by the Program Implementer.
3. **AUTHORIZATION, PROGRAM CHANGES, SUSPENSION OR CANCELLATION:** Entergy Arkansas may change the program requirements, incentives, or T&Cs, including suspending acceptance of applications or terminating the program, at any time without notice. In the event of a program change, pre-approved applications will be processed to completion under the T&Cs in effect at time of pre-approval. Entergy Arkansas' obligation to pay incentives will occur only after Entergy Arkansas has granted written authorization, which Entergy Arkansas may approve or disapprove at its sole discretion.
4. **PROJECT APPROVAL:** Pre-approval is required for all Custom and Prescriptive projects. Entergy Arkansas reserves the right to pre-inspect any project prior to pre-approval. No project-related ECMs may be ordered or installed prior to the date of Entergy Arkansas' pre-approval.
5. **PROOF OF PURCHASE:** Prior to Entergy Arkansas' verification of the ECM installation, the Customer must provide copies of all invoices or other reasonable documentation that verify the costs of purchasing and installing the ECMs, including all material, labor, and equipment discounts. Invoices must indicate a verifiable breakout of all ECMs purchased for installation under this application.
6. **PROJECT VERIFICATION:** Entergy Arkansas is not obligated to pay any incentive until it has performed a satisfactory post-installation inspection. If Entergy Arkansas determines that ECMs were not installed in a manner consistent with the approved application, or if an unapproved ECM was installed, or if the installation was not consistent with generally accepted engineering practices, changes may be required before payment is issued. Entergy Arkansas' sole liability is limited to paying the properly qualified rebates specified herein. Neither Entergy Arkansas nor any of its affiliates shall be liable to the Customer or any other party for any indirect, consequential, or incidental damages, regardless of the theory of recovery, caused by or arising from any activities associated with this program.
7. **CUSTOMER TAX OBLIGATION:** The Customer is responsible for declaring and paying any and all applicable federal, state, and local taxes that may be owed on any incentive payment.
8. **COMPLIANCE:** The Customer is responsible for obtaining any and all necessary licenses and permits related to the installation of ECMs. The Customer also agrees to comply with all federal, state, and local laws and regulations related to the installation and disposal of all equipment.
9. **REMOVAL OF EQUIPMENT:** The Customer agrees to remove and dispose of the equipment being replaced by the ECMs in accordance with all legal requirements. The Customer agrees not to re-install any of this equipment in the Entergy Arkansas service territory or transfer it to any other party for such installation.
10. **REPLACEMENT OF FAILED EQUIPMENT:** Customers who install ECMs are expected to replace any of the ECMs that fail with similar or superior energy saving equipment at the Customer's expense.
11. **EVALUATION FOLLOW-UP VISITS:** With advance notice, Entergy Arkansas reserves the right to make follow-up visits to Customer facilities during the 36 months following the actual completion of the project to provide Entergy Arkansas with an opportunity to review the operation of the ECMs for program evaluation purposes.
12. **CONTRACTOR SELECTION:** The Customer may select any contractor to perform the work contemplated by the application, whether an Entergy Arkansas Trade Ally or not. However, Entergy Arkansas reserves the right, in its sole reasonable discretion, to prohibit specific contractors from program participation.
13. **NO WARRANTIES:** Entergy Arkansas does not endorse, guarantee, or warrant any particular manufacturer or product and Entergy Arkansas provides no warranties, expressed or implied, for any products or services. Entergy Arkansas is not liable or responsible for any act or omission of any contractor hired by the Customer (if any) whether or not said contractor is a participating Entergy Arkansas Trade Ally. The Customer's reliance on warranties is limited to any warranties that may arise from, or be provided by contractors, vendors, etc. The Customer acknowledges that neither Entergy Arkansas nor any of its consultants are responsible for assuring the design, engineering, and construction of the facility or installation of the ECMs is proper or complies with any particular laws (including patent laws), codes, or industry standards. Entergy Arkansas does not make any representations of any kind regarding the results to be achieved by the ECMs or the adequacy of safety of such measures.
14. **LIMITATION OF LIABILITY:** Entergy Arkansas' sole liability is limited to paying the properly qualified rebates specified herein. Entergy Arkansas shall not be liable to the Customer or any other party for any indirect, consequential, or incidental damages, regardless of the theory of recovery, caused by or arising from any activities associated with this program.
15. **OBLIGATIONS BETWEEN THE PARTIES:** Customer acknowledges that any contractor selected by the Customer is not an agent, contractor, or subcontractor of Entergy Arkansas and is an independent contractor engaged by the Customer, and that Entergy Arkansas does not manage or control the contractor's performance. Entergy Arkansas shall have no obligation to maintain, remove, or perform any work whatsoever on the ECMs installed. Entergy Arkansas shall have no liability for contractor's failure to perform, for failure of the ECMs to function, for any damage to the Customer's premises caused by the contractor, or for any and all damages to property or injuries to persons caused by the ECMs.
16. **MISCELLANEOUS:** These T&Cs and this application constitute the entire agreement between the parties and supersede all other communications and representations.

AES Prescriptive Application

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Entergy
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Agricultural Energy Solutions Program Prescriptive Application

The Agricultural Energy Solutions Program is offered to agribusiness customers of Entergy Arkansas, Inc. Prescriptive incentives are available for lighting upgrades in existing facilities and are based on predetermined amounts for specified types of upgrades listed on this application.

1. All Prescriptive projects require pre-approval prior to purchase or installation of equipment; a pre-installation inspection may be required.
2. Upon receipt of written approval, the customer may begin project installation. Projects must be completed by the date indicated on the pre-approval letter.
3. Customers must notify Entergy Arkansas upon project completion. If the project is completed in a manner different from what was indicated in the approved application, the customer shall provide an amended application explaining the changes prior to making the changes. Incentives will be determined based upon the actual qualified equipment installed. Copies of invoices for all work are required.
4. A post-installation inspection may be required.
5. Upon final approval of the project, incentives will be paid to the customer (account holder) within 6-8 weeks.

CUSTOMER/PROJECT INFORMATION (ENTERGY ARKANSAS ACCOUNT HOLDER)

Company Name		**Contact Person**	**Title**	
Street Address		**Entergy Arkansas Electric Account Number**		
City	**ZIP**	**Email**	**Telephone**	
Mailing Address *(if different)*		**City**	**State**	**ZIP**

☐ Corporation ☐ LLC ☐ Partnership ☐ Individual Proprietorship ☐ Not-for-Profit

Farm Type: ☐ Aquaculture ☐ Cattle ☐ Dairy ☐ Delta/Row Crops ☐ Poultry ☐ Swine ☐ Other	**Expected Completion Date**

CONTRACTOR INFORMATION

Contractor Company Name	**Contact Person**	**Title**	
Street Address	**City**	**State**	**ZIP**
License Number	**Email**	**Telephone**	

CUSTOMER ACKNOWLEDGMENT

Pre-Installation – By signing below, I hereby certify that all statements made on this application are correct to the best of my knowledge and that I have read and agree to the **Terms and Conditions** on page 4.

Authorized Representative *(please print)*	**Title**
Authorized Signature	**Date**

Post-Installation – By signing below, I hereby certify that I have seen the Energy Efficiency Measures that have been installed and I am satisfied with their installation.

Authorized Representative *(please print)*	**Title**
Authorized Signature	**Date**

IRS Form W-9 must be completed for the Customer receiving the incentive payment from Entergy Arkansas. IRS Form W-9 is available at irs.gov.

ADMINISTRATIVE USE ONLY

Date Received	**Project Number**	**Program Rep.**
Pre-approved Date	**Program Manager**	**Pre-approved Incentive $**
Final Approval Date	**Program Manager**	**Final Incentive $**

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AES Prescriptive Application, page 2

LINEAR FLUORESCENT LAMP AND BALLAST REQUIREMENTS

PRESCRIPTIVE LIGHTING INSTRUCTIONS

1. Complete the room-by-room inventory worksheet using the Prescriptive Lighting Worksheet. Rated wattages for various existing luminaire types are found in the Lighting System Rated Wattage Table (included on the Prescriptive Lighting Worksheet). The calculated energy savings from the existing fixture to the proposed fixture must meet the minimum watt reduction requirement listed for each measure code.
2. Meet measure code eligibility requirements found in the tables on page 3.
3. Submit the completed electronic copy of the worksheet in accordance with the instructions on the worksheet, along with this application for pre-approval or final approval, as appropriate.
4. **CFLs purchased at retail centers participating in the residential lighting program are ineligible.**

LIGHTING SYSTEM INCENTIVES

Measure Code	Measure Description	Incentive Amount	Min. Watts Reduced
8	Screw Base CFL Lamps - up to 32 Watts (Replacing < 100W Incandescent)	$2	36
9	Screw Base CFL Lamps - 33-115 Watts (Replacing > 100W Incandescent)	$5	95
10	Screw Base CFL Reflector Flood Lamps - up to 30 Watts (Replacing < 100W Incandescent)	$4	63
12a	High Performance or reduced wattage T8 4' 1-2 Lamp System (Replacing standard 4' T8 or T12)	$3	10
12b	High Performance or reduced wattage T8 4' 3-4 Lamp System (Replacing standard 4' T8 or T12)	$5	20
15	Permanent delamping/retrofit: retrofit existing 2-3L T12 or T8 systems with HPT8, 1-2L Reduced Wattage T8 or T5/T5HO lamps and qualifying ballasts. Permanent delamping is required through the use of approved retrofit and / or reflector kits.	$10	25
16	Permanent delamping/retrofit: retrofit existing 3-4L T12 or T8 systems with HPT8, 2-3L Reduced Wattage T8 or T5/T5HO lamps and qualifying ballasts. Permanent delamping is required through the use of approved retrofit and / or reflector kits.	$18	50
30a	Replace or Retrofit 8' 2-Lamp T-12 with 2-4' HPT8 or Reduced Wattage Lamp	$10	40
30b	Replace or retrofit 8' 2-Lamp T-12 with 4-4' HPT8 or Reduced Wattage Lamp	$10	30
30c	Replace or retrofit 8' 1-Lamp T-12 with 2-4' HPT8 or Reduced Wattage Lamp	$10	11
31a	Replace or retrofit 8' 2-Lamp T-12HO with 4-4' HPT8 or Reduced Wattage Lamp	$20	70
31b	Replace or retrofit 8' 2-Lamp T-12VHO with 4-4' HPT8 or Reduced Wattage Lamp	$40	150
59	Pulse-Start Metal Halide - Gasketed Fixture - 320W (replacing 400W HID fixture)	$25	110
64	300W Induction replacing 400W HID Fixtures/components (Electrodeless lighting)	$40	135
65	High Ceiling Fluorescent ≤ 155 Watts (Replacing 250-399W HID)	$25	105
66	High Ceiling Fluorescent ≤ 300 Watts (Replacing 400-999W HID or equivalent)	$50	160

LIGHTING CONTROL INCENTIVES

Measure Code	Measure Description	Incentive Amount	Min. Watts Controlled
81	Wall Mounted Occupancy Control (Non-high bay applications)	$8	120
82	Ceiling Mounted Occupancy Control (Non-high bay applications)	$15	240
83	Fixture Mounted Occupancy Control (Non-high bay applications)	$5	75
84	Daylighting Stepped Control (Minimum two lighting levels, not including off)	$125/Control	450
85	Daylighting Continuous Dimming Control	$225/Control	450

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AES Prescriptive Application, page 3

LINEAR FLUORESCENT LAMP AND BALLAST REQUIREMENTS

- High-Performance T8, Reduced-Wattage T8, T5/T5HO lamps and qualifying ballasts are permitted for all measure codes unless specified otherwise in the lighting system eligibility requirements.
- 32W 4-ft T8 lamps and T8 ballasts must be listed on the Consortium for Energy Efficiency product list or must meet CEE standards. Visit CEE1.org for further information.
- Reduced-wattage T8 lamps are acceptable provided they are on CEE's *Reduced-Wattage T8* list.
- 8-ft T8 and T5 lamps are not eligible for prescriptive lighting incentives.
- 17W 2-ft T8 lamps must have minimum efficacy of 75 mean lumens/watt.
- 32W U-bend T8 lamps must have minimum efficacy of 79 mean lumens/watt.

Measure Code	Lighting System Eligibility Requirements	Measure Code	Lighting Controls Eligibility Requirements
8/9/10	• See measure descriptions on page 2.	59	• Replacing 400W HID gasketed fixtures/components designated as "Suitable for Wet Locations" with 320W pulse-start metal halide gasketed fixtures/components designated as "Suitable for Wet Locations." • Must be permanently-wired ballast and lamp retrofit or complete new fixture – screw in retrofit lamps do not qualify. • Indoor applications only.
12a/12b	• Lamp-for-lamp retrofits of existing T12 or T8 fluorescent systems. • Lamps and ballasts may replace existing T12 or full-wattage T8 systems. • Reduced wattage T8 lamps must be listed on CEE qualifying *Reduced Wattage T8* list and installed in conjunction with qualifying electronic ballasts.		
15/16	• Delamping and retrofit of existing T12 or T8 fluorescent systems. • Luminaries must be permanently delamped through the use of UL / CSA-listed retrofit kits specifically for this purpose; lamps must be re-centered in luminaries. • Light levels may be affected; therefore, delamping may not be appropriate for all applications. • Reflectors, if specified, shall have a minimum reflectivity of 90% and should be used if necessary to provide proper lighting levels or quality.	64	• Replacing 400W HID with 300W induction fixtures/components. • Must be permanently-wired ballast and lamp retrofit or complete new fixture – screw in retrofit lamps do not qualify. • Indoor applications only.
		65/66	• Installation of fluorescent luminaries in place of HID sources • Reduced wattage T8 and standard T5 lamps are no permitted with this measure code. • Overall fixture efficiency must be equal to or greater than 80%
		Measure Code	**Lighting Controls Eligibility Requirements**
		81	• Hardwired wall switch occupancy sensor; passive infrared, ultrasonic, or dual technology. • Occupancy sensors with "manual on" override are not eligible for incentives.
30a/30b 30c	• Installation of 2-lamp high-efficiency luminaries in place of those with higher lamp quantity in retrofit or new construction. • T5 and T5HO lamps and ballasts are not permitted with this measure code. • Overall fixture efficiency must be equal to or greater than 83% for prismatic; 75% for parabolic • Eligible new fixtures may be surface, recessed, suspended or self-contained retrofit kits.	82	• Hardwired ceiling or wall-mounted remote occupancy sensor; passive infrared, ultrasonic, or dual technology. • Occupancy sensors with "manual on" override are not eligible for incentives.
		83	• Hardwired fixture-mounted occupancy sensors; passive infrared, ultrasonic, or dual technology. • Sensors may be furnished as new equipment by fixture manufacturer or installed on existing fixtures in retrofit applications.
31a/31b	• Existing fixtures must be HO or VHO • Installation of 2-lamp high-efficiency luminaries in place of those with higher lamp quantity in retrofit or new construction. • T5 and T5HO lamps and ballasts are not permitted with this measure code. • Overall fixture efficiency must be equal to or greater than 83% for prismatic; 75% for parabolic • Eligible new fixtures may be surface, recessed, suspended or self-contained retrofit kits.	84	• Hardwired occupancy sensor designed to operate lamps in high/low mode. • Ballast wattage on "low" mode shall not exceed 60% of rated fixture wattage. • Minimum of four ballasts per control unit.
		85	• Hardwired photo sensor designed to dim lamps in response to ambient daylight • Minimum of four CEE-listed dimming ballasts per control unit

Please complete this application and submit it via one of the following methods:

Email: cody.allen@icfi.com • Fax: 501-325-0443

Contact Account Manager Cody Allen with any questions or concerns: 501-244-9570

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AES Prescriptive Application, page 4

TERMS AND CONDITIONS

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13. **NO WARRANTIES:** Entergy Arkansas does not endorse, guarantee, or warrant any particular manufacturer or product and Entergy Arkansas provides no warranties, expressed or implied, for any products or services. Entergy Arkansas is not liable or responsible for any act or omission of any contractor hired by the Customer (if any) whether or not said contractor is a participating Entergy Arkansas Trade Ally. The Customer's reliance on warranties is limited to any warranties that may arise from, or be provided by contractors, vendors, etc. The Customer acknowledges that neither Entergy Arkansas nor any of its consultants are responsible for assuring the design, engineering, and construction of the facility or installation of the ECMs is proper or complies with any particular laws (including patent laws), codes, or industry standards. Entergy Arkansas does not make any representations of any kind regarding the results to be achieved by the ECMs or the adequacy of safety of such measures.
14. **LIMITATION OF LIABILITY:** Entergy Arkansas' sole liability is limited to paying the properly qualified rebates specified herein. Entergy Arkansas shall not be liable to the Customer or any other party for any indirect, consequential, or incidental damages, regardless of the theory of recovery, caused by or arising from any activities associated with this program.
15. **OBLIGATIONS BETWEEN THE PARTIES:** Customer acknowledges that any contractor selected by the Customer is not an agent, contractor, or subcontractor of Entergy Arkansas and is an independent contractor engaged by the Customer, and that Entergy Arkansas does not manage or control the contractor's performance. Entergy Arkansas shall have no obligation to maintain, remove, or perform any work whatsoever on the ECMs installed. Entergy Arkansas shall have no liability for contractor's failure to perform, for failure of the ECMs to function, for any damage to the Customer's premises caused by the contractor, or for any and all damages to property or injuries to persons caused by the ECMs.
16. **MISCELLANEOUS:** These T&Cs and this application constitute the entire agreement between the parties and supersede all other communications and representations.

AES Promo Letter

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

Cody Allen
Energy Efficiency Contractor
Entergy Arkansas Agricultural Energy Solutions Program
425 West Capitol, Suite 3630
Little Rock, AR 72201

<<Letter Date>>

<<Customer Name>>
<<Company>>
<<Address>>
<<City, State, ZIP>>

Dear <<Customer Name>>,

Entergy Arkansas is helping agribusiness customers build energy efficiency into every project – and make every dollar count! For a limited time, we're offering cash incentives to help cover the cost of installing energy-efficient irrigation pump variable frequency drives. If you have a pump that operates at a range of different flows throughout the year or that draws from a well with a depth that varies significantly, these drives can help you dramatically reduce your energy costs and increase your profits while still having the ability to pump the water you need.

There also a variety of options to help you build energy efficiency into every project, whether you are retrofitting existing inefficient equipment, purchasing new equipment, replacing equipment at the end of its lifespan, conducting major renovations, constructing a new facility or replacing lighting with efficient bulbs.

If you'd like to learn more about the Agricultural Energy Solutions Program and how it can help you save money and earn incentives from Entergy Arkansas, call me to schedule an appointment to discuss your specific business needs. You can reach me at **cody.allen@icfi.com** or by phone at **501-416-2067**.

Regards,

Cody Allen

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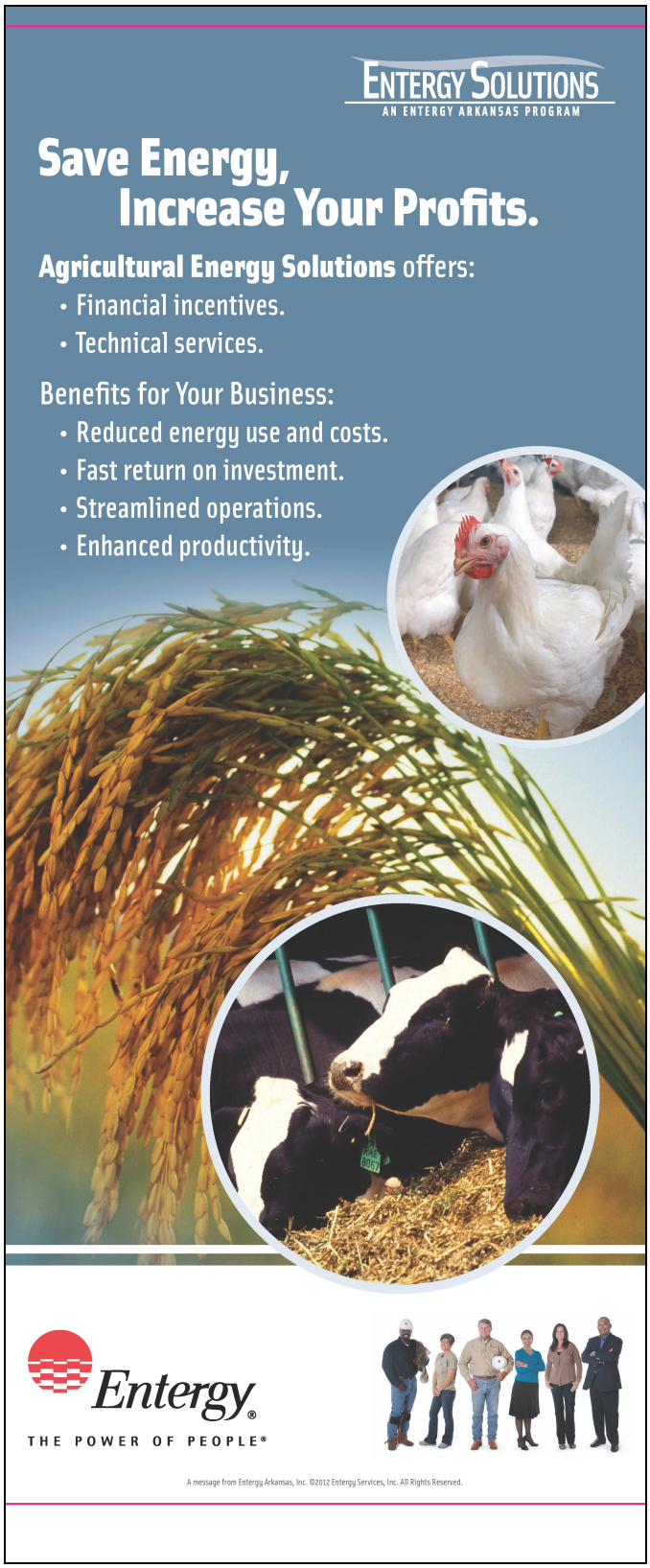
AES Banner Stand



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AES Poultry Pre-Installation Form

ENTERGY SOLUTIONS
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Agricultural Energy Solutions Program Poultry Pre-Installation Form	
Inspector	
Inspection Date	
Farm Name	
Contact Name	
Address	

FARM INFORMATION					
Company	Contracted Flocks Per Year	Kill Age	Estimated Out Time	Hours of Operation	Hours of Operation During Out Time
				1.	
				2.	
				3.	
				4.	

BULB INFORMATION						
Bulb Manufacturer	LED/CFL	Bulb Life	Bulb Lumens	Wattage Pre	Wattage Post	Wattage Reduced

BULB INFORMATION				
House/Barn	Total Bulb Amount	Total Bulbs Replaced Brood End	Total Bulbs Replaced Grow Out	Total Bulb Retrofit Amount
1				
2				
3				
4				
5				
6				
7				
8				

Agricultural Energy Solutions – Poultry Pre-Installation Form 3/27/13

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AES Poultry Pre-Installation Form, Reverse

HOURS OF OPERATION AND DIMMING INFORMATION

House/Barns	Light Dimmer	If Yes, Dimmer Type/Manufacturer	Stages of Dimming #1	Stages of Dimming #2	Stages of Diming #3
1	☐ Y/N ☐				
2	☐ Y/N ☐				
3	☐ Y/N ☐				
4	☐ Y/N ☐				
5	☐ Y/N ☐				
6	☐ Y/N ☐				
7	☐ Y/N ☐				
8	☐ Y/N ☐				

NOTES

AES Post-Installation VFD Form

ENTERGY SOLUTIONS
AN ENTERGY ARKANSAS PROGRAM

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Agricultural Energy Solutions Program Post-Installation VFD Verification Form

Inspector	
Inspection Date	
Farm Name	
Contact Name	
Address	
Vision Project Number	

GENERAL INFORMATION

Crop Type	Acreage	Irrigation Type	Well Depth at Planting (Feet)	Well Depth at Harvest (Feet)	Annual Hours of Operation
☐ Corn ☐ Rice ☐ Soy ☐ Cotton ☐ _____		☐Flood ☐Furrow ☐Border ☐Center Pivot ☐Lateral Move ☐_____			

VFD/MOTOR INFORMATION

VFD Manufacturer	Motor Manufacturer	Drive HP	Motor HP

PUMPING INFORMATION

Pump Rated Speed (RPM)	Pump Design Capacity (GPM)	Pressure at Discharge of Pump	Pump HP at Discharge Pressure

SIMPLE SCHEDULE INPUTS

Seasonal Start Date	
Seasonal Stop Date	

Flow Rate Interval, Percentage of Maximum Flow and/or % Time Off

OFF	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Percentage of time at each flow rate interval

PUMP PERFORMANCE CURVE AT RATED RPM

	Flow (GPM)	Head (feet)	Efficiency (%)
Point 1			
Point 2			
Point 3			
Point 4			

Agricultural Energy Solutions – Post Installation VFD Form 3/27/13

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AES Post-Installation VFD Form, Reverse

ADDITIONAL REQUIRED INFORMATION	
Receipt	A receipt must be provided showing incremental cost of the VFD install. The cost associated with the VFD should include, but is not limited to the following: labor, VFD, wiring and other products associated with the install. Please attach this information.

CONTRACTOR ACKNOWLEDGEMENT (VFD)	
By signing below, I hereby certify that all statements made on this application are correct to the best of my knowledge.	
Authorized Representative (Please Print)	
Authorized Signature	
Title	
Date	

CONTRACTOR ACKNOWLEDGEMENT (PUMP/WELL)	
By signing below, I hereby certify that all statements made on this application are correct to the best of my knowledge.	
Authorized Representative (Please Print)	
Authorized Signature	
Title	
Date	

ADMINISTRATIVE USE ONLY	
Inspector Name (Please Print)	
Title	
Signature	
Date	
Entergy Arkansas Representative	
Title	
Signatgure	
Date	

If you need assistance, please contact Cody Allen at cody.allen@icfi.com or 501-244-9570.