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Impact and Process Evaluation of the 2013 (PY6) Ameren Illinois Company Residential Energy- Efficient Products Program

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CADMUS

NAVIGANT



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1. Executive Summary

Ameren Illinois Company’s (AIC) Residential Energy-Efficient Products (REEP) Program exceeded its electric and gas energy-savings goals for Program Year (PY) 6, which ran from June 1, 2013 to May 31, 2014. Conservation Services Group (CSG), Applied Proactive Technologies (APT), and Energy Federation Incorporated (EFI) implemented the program. Through retailers in AIC’s service territory, the REEP Program offered customers rebates for the following types of efficient products:

- Programmable thermostats
- Heat pumps or efficient gas water heaters
- Air purifiers
- Smart power strips

Throughout PY6, program staff and participating retailers placed rebate applications on or near program-eligible products, and APT staff provided training to retail employees on the program and eligible products and on methods for effectively stocking products and speaking with interested customers. Participating customers mailed completed applications to EFI. Customers could also download rebate applications from the ActOnEnergy website.

1.1 Impact Results

Table 1 outlines the number of measures rebated through the program in PY6, the share of rebated measures installed and operating as intended (verification rate), and the number of verified measure installations by measure type.¹ Customer research conducted in PY4 revealed that a significant percentage of participants do not use programmable thermostats or smart power strips as intended and thus do not generate energy savings, which accounted for the lower verification rates. We calculated PY6 ex post savings using the number of verified measure installations.

Table 1. Summary of PY6 Program Verification Results

Measure	Number of Measures in Tracking Database**	Verification Rate (PY4)	Verified Measure Installations
Programmable Thermostat*	5,599	56%***	3,135
Air Purifier	1,212	100%	1,212
Smart Power Strip	857	46%	394
0.67 Water Heater	417	100%	417
Heat Pump Water Heater	115	100%	115
0.70 Water Heater	75	100%	75

* The table shows the actual number of thermostats, as all duplicate thermostats for participants that are both electric and gas customers have been removed.

** Number of rebated measures.

*** Despite a 53% verification rate in PY4, the Technical Reference Manual specifies applying a 56% in-service rate to calculate thermostat savings. Therefore, 56% is used in this table.

¹ Measure verification rates were derived from the PY4 survey of program participants.

Table 2 shows PY6 program ex ante and ex post net impacts. The tracking database provided ex ante gross estimates, which the evaluation team did not adjust. We applied the net-to-gross ratio (NTGR) in Table 2 to the ex post gross savings to calculate ex post net savings.

Table 2. PY6 REEP Program Ex Ante and Ex Post Savings

Measure	Savings Type	Ex Ante			Verification Rate	Ex Post			Net Realization Rate****
		Gross Savings*	NTGR	Net Savings*		Gross Savings**	NTGR	Net Savings***	
Programmable Thermostat AC and Gas Heat	Therms	127,351	0.90	114,616	56%	96,896	0.90	87,207	76%
	MWh	104	0.86	89		82	0.86	71	79%
	MW	0	0.86	0		0	0.86	0	0%
Programmable Thermostat Electric Heat	MWh	649	0.86	558	56%	490	0.86	422	76%
	MW	0	0.86	0		0	0.86	0	0%
Heat Pump Water Heater	MWh	265	0.86	228	100%	269	0.86	231	102%
	MW	0.013	0.86	0.011		0.013	0.86	0.011	102%
0.67 Water Heater	Therms	9,708	0.90	8,737	100%	10,210	0.90	9,189	105%
0.70 Water Heater	Therms	2,264	0.90	2,038	100%	2,005	0.90	1,804	89%
Air Purifier	MWh	665	0.78	519	100%	681	0.78	532	102%
	MW	0.076	0.78	0.059		0.078	0.78	0.061	102%
Smart Power Strip	MWh	31	0.86	27	46%	22	0.86	19	71%
	MW	0.004	0.86	0.003		0.003	0.86	0.002	71%
Total Program	Therms	139,323	0.90	125,391		109,111	0.90	98,200	78%
	MWh	1,714	0.83	1,421		1,545	0.82	1,274	90%
	MW	0.092	0.79	0.073		0.093	0.79	0.074	101%

* Ex ante results calculated using values assumed by the program implementer.

** Adjusted for verification rate.

*** Ex post results calculated using verified installation rates, ex post per-unit savings, and PY4 NTGR. Results may not total due to rounding.

**** Net realization rate = ex post net savings ÷ ex ante net savings. Results may differ due to rounding.

Net realization rates varied significantly across measures, mostly due to the following discrepancies:

- Ex ante savings that are based on an assumed product size and efficiency, while ex post savings take into account actual product sizes and efficiency levels
- A different distribution of participant home locations than assumed (affecting weather-dependent measure gross impacts)

1.2 Process Results

Based on information gleaned from interviews with the program manager and program implementers, the program worked as intended in PY6:

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- AIC, CSG, APT, and EFI effectively collaborated to successfully administer and deliver the program to participating customers.
- The program manager and implementers did not identify any major challenges or participation barriers (other than a lack of customer understanding regarding smart power strips).
- Program marketing, primarily point-of-purchase materials and rebate applications, generated sufficient program awareness.
- The program exceeded overall energy electric and gas savings goals.

However, the evaluation team did identify some issues in the tracking database in conducting our evaluation, including incomplete equipment details, inconsistencies between different worksheets in the database, and a lack of detail regarding ex ante savings calculations.

According to interviews with program stakeholders, the REEP program is designed to transform the market for qualifying measures, creating availability and consumer demand for energy-efficient models. Since AIC suspended this program after PY6, ongoing monitoring should assess the degree to which markets have been transformed. AIC could consider collaborating with previously participating retail stores, many of which participate in the Upstream Lighting Program, and ask them to track whether sales of these products continue at current levels or drop after the program's end. The information could prove useful for estimating future spillover from AIC's portfolio.

1.3 Conclusions and Recommendations

Though AIC will not offer the REEP Program in PY7, the evaluation team offers the following recommendations for AIC's consideration as they may be applicable to other programs:

- **Consider consolidating the four-part tracking database into two parts.** The application data table and the savings table should be combined into one database for each program type (electric and gas). The evaluation team's review found quantity discrepancies between the two worksheets in the tracking database. Consolidating the tables would provide quality assurance by eliminating possible discrepancies in tracking data.
- **Complete specification tracking for all equipment model numbers.** The program thoroughly tracked the make and model number of all appliances, but incompletely tracked equipment details and specifications used for sizing and as inputs to savings calculations. Section 4.3.1 details the evaluation requirements missing from the database for PY6.
- **Include detailed calculations and assumptions for ex ante per-unit energy and demand savings.** For a more accurate impact analysis, the evaluation team should better understand the implementer's methodology for claimed savings.
- **Create an online database that program managers or evaluation staff could access to obtain program updates as needed** (and as noted in previous evaluations across AIC's residential portfolio). AIC staff would like more frequent reports and copies of the database during program implementation.
- **Consider leveraging existing marketing opportunities**, such as general program marketing materials, in-store promotional activities for the Upstream Lighting Program, and AIC's presence at state fairs. This would continue to educate consumers about the benefits of energy-efficient products, especially

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smart power strips, thus serving to further the market transformation goal shared by all AIC programs and creating spillover for AIC's energy-efficiency portfolio.

2. Introduction

PY6 marked the third year Ameren Illinois Company (AIC) offered the Residential Energy-Efficient Products (REEP) Program as a stand-alone offering. AIC originally offered the REEP Program in combination with the Upstream Lighting Program. PY6 covered the period from June 1, 2013 through May 31, 2014. For reasons discussed later in this report, AIC chose not to continue the program in PY7.

2.1 Program Description

Through retailers in AIC’s service territory, the REEP Program offered customers rebates on an array of ENERGY STAR® and other efficient products, listed in Program measures offered in PY6 included both simple, easy-to-install items and more complex products that sometimes require professional installation. In addition to the established energy-savings goals, the program sought to create a stronger market for efficient products.

Table 3. Program measures offered in PY6 included both simple, easy-to-install items and more complex products that sometimes require professional installation. In addition to the established energy-savings goals, the program sought to create a stronger market for efficient products.

Table 3. Efficient Products Available in PY6

Product	Rebate Amount	Electric Customers Eligible	Gas Customers Eligible
Heat Pump Water Heater	\$300	✓	
0.70 Water Heater	\$75		✓
0.67 Water Heater	\$50		✓
Programmable Thermostat	\$25	✓	✓
Air Purifier	\$20	✓	
Smart Power Strip	\$10	✓	

Retailers included larger retail stores (such as Walmart and Lowe’s) and some smaller hardware store chains and cooperatives (such as Rural King and Ace Hardware). Program staff and participating retailers placed the rebate applications on or near products to ensure customers’ awareness of the rebates. Customers submitted rebate applications via mail. Customers could also obtain rebate applications as downloads from the ActOnEnergy website. To qualify for rebates, the program required customers to submit their AIC utility bills to prove their eligibility.

In conjunction with AIC, Conservation Services Group (CSG), Applied Proactive Technologies (APT), and Energy Federation Incorporated (EFI) implemented the program. CSG served as the primary implementation contractor, playing an oversight role and managing the program. APT served as the day-to-day operations contractor and subcontractor to CSG. APT was responsible for all program fieldwork, as well as the following activities:

- Negotiating memoranda of understanding (MOUs) with retailers
- Training retail store employees to effectively stock products and speak with interested customers
- Developing point-of-purchase (POP) materials and ensuring proper placement in retail stores

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- Monitoring and adjusting MOUs
- Conducting in-store educational clinics for retail customers

Retail stores offering the products were largely responsible for marketing the program, using POP signs and rebate applications placed on or near the products offered. APT staff provided training to retail employees on the program and eligible products and on methods for effectively stocking and placing products and speaking with interested customers.

EFI collected all rebate applications, entered data from the applications into the program's tracking database, approved the rebate applications, and sent rebate checks to participants.

2.2 Research Objectives

The evaluation team's review of the PY6 REEP Program sought to address the following research objectives:

- Calculate gross and net energy and demand savings
- Assess program processes, successes, and challenges
- Assess why the program did or did not meet its energy-savings goals

3. Evaluation Methods

To address research objectives outlined in the previous section, the evaluation team conducted program staff interviews and database analysis, as summarized in Table 4. The team also reviewed implementer progress reports and program rebate applications.

Table 4. Summary of REEP Program Evaluation Activities for PY6

Activity	PY6 Impact	PY6 Process	Details
Program Staff Interviews		✓	Interviewed four program and implementation staff members to gain insights into program processes, successes, and challenges.
Database Analysis	✓	✓	Summarized database information to determine participation, key program statistics, and savings.

A summary follows of the methodology employed for each activity.

3.1 Data Collection

3.1.1 Program Staff Interviews

To assess the program’s effectiveness and implementation, the evaluation team conducted interviews with AIC’s program manager, CSG’s implementation manager, and the program leads at APT and EFI. Interviews covered such topics as program design, implementation and delivery, marketing, and implementation barriers.

The evaluation team used information obtained from stakeholders to inform the following evaluation elements:

- Describing how the program operated and how retailers and customers received news of its closure
- Determining the effectiveness of program processes
- Identifying successes and challenges

3.1.2 Review of Program Data

The evaluation team reviewed and analyzed the PY6 REEP Program-tracking database. This included reviewing deemed ex ante gross and net impacts for each measure to ensure correct and consistent applications among all project IDs. We found complete agreement between our findings and the provided database per-unit impact summary. The evaluation team also reviewed the database to preclude duplication of project IDs and avoid double-counting savings. Lastly, the analysis cross-referenced all project IDs in the savings database to the application database in an effort to discover discrepancies in field records. The evaluation team found minor discrepancies. Section 4.2 describes those discrepancies in greater detail.

3.2 Analytical Methods

To calculate ex post gross and net impacts for each measure type, the evaluation team reviewed tracking data to confirm the number of rebated measures. We then applied the verification rate shown in Table 1 to get the verified number of rebated units installed and operating, applied the Illinois Statewide TRM for Energy

Efficiency Version 2.0 (June 7, 2013) equations to calculate gross savings, and applied the deemed net-to-gross ratio (NTGR) to gross savings to estimate net savings.

3.2.1 Gross Impacts

Using the PY6 customer-tracking database, Statewide TRM Version 2 algorithms and assumptions, and other resources, as applicable,² the evaluation team performed individual savings calculations for each project ID and aggregated the results into average per-unit gross impacts for each measure type. Multiplying the per-unit gross impacts by the verified number of measures determined the measure-level ex post gross impacts. Only thermostats and smart power strips exhibited verification rates of less than 100% (estimated from the PY4 participant survey) (i.e., verified counts less than the ex ante counts from the tracking database). However, since the Statewide TRM Version 2 specified a deemed in-service rate (56%) for thermostat measures, the evaluation team used it in place of the PY4 participant survey verification rate (53%). This is the only measure where the team made a substitution since it is the only measure where the Statewide TRM Version 2 specified an in-service rate.

3.2.2 Net Impacts

To estimate net savings, the evaluation team relied on data collected during the PY4 REEP participant surveys, as detailed below. We multiplied the ex post gross savings by the NTGR to determine ex post net impacts.

3.2.3 Net-to-Gross Ratios

In PY4, the evaluation team estimated NTGRs using self-reported results from the 190 participant surveys, segmenting the sample by measure type, as shown in Table 5.

Table 5. PY4 Completed REEP Program Survey Points

Project Type	Database Population Projects	Sample Frame		
		Contacts	Completed	Precision at 90% Confidence
Room Air Conditioner*	5,552	149	21	18%
Programmable Thermostats	3,730	304	48	12%
Smart Power Strip	1,482	153	28	16%
Air Purifier	907	150	30	15%
0.67 Water Heater	243	151	27	17%
Dehumidifier*	120	117	14	23%
Heat Pump Water Heater	73	73	21	20%
0.70 Water Heater	27	27	1	84%
Total	12,117	1,124	190	6%

* Air conditioners and dehumidifiers were dropped from the program since PY4.

² The evaluation team used online searches to gather model numbers, efficiency values, and location weather data for certain measures.

The evaluation team applied the PY4 NTGRs because the program design had not changed significantly since PY4. We calculated NTGR according to the following formula:

$$\text{NTGR} = 1 - \text{free-ridership} + \text{participant spillover}$$

Free-Ridership

For the PY4 evaluation, the evaluation team applied a spreadsheet-based matrix approach, assigning a free-ridership score to participants based on their responses to six survey questions. This assigned free-ridership scores to question response patterns, allowing calculation of confidence and precision estimates on distributions of these scores.³

Participant Spillover

The evaluation team asked each participating customer to list additional energy-efficient items that had been installed in their home since participating in the program for which they did not receive an incentive from AIC. Surveys asked these customers to rate whether their experience in the REEP Program proved “very important,” “somewhat important,” “not very important,” or “not at all important” in the purchase process. The evaluation team only counted measures where respondents rated program participation as “very important” on subsequent purchases. For each measure type, the evaluation team estimated energy savings, either in comparison to federal standard efficiency using the ENERGY STAR calculator or by using savings estimates from other AIC programs, as appropriate.

3.3 Sources and Mitigation of Error

Table 6 summarizes possible error sources associated with data collection conducted for the REEP Program. A discussion follows detailing each item.

Table 6. Possible Sources of Error

Analytical Task	Survey Errors		Non-Survey Errors
	Sampling	Non-Sampling	
Gross Savings Calculations	N/A	N/A	• Data Processing Errors
Net Savings Calculations	N/A	N/A	• Data Processing Errors

Throughout the planning and implementation of the PY6 evaluation, the evaluation team took a number of steps to mitigate against potential sources of error.

Gross Savings Calculations

- **Data Processing Errors:** The evaluation team applied Statewide TRM Version 2 calculations to participant data in the tracking database to calculate gross impacts. To minimize data processing errors, a separate evaluation team member reviewed all calculations to verify accurate performance of calculations.

³ The PY4 report (*Impact and Process Evaluation of 2011 [PY4] Ameren Illinois Company Efficient Products Program*) includes a detailed analysis and description of free-ridership analysis. Prepared by Cadmus under subcontract to Opinion Dynamics Corporation, October 2012.

Net Savings Calculations

- **Data Processing Errors:** The evaluation team applied the prospective deemed NTGR to estimate the program's net impacts. To minimize data processing errors, a separate evaluation team member reviewed all calculations to verify accurate performance of calculations.

4. Evaluation Findings

4.1 Program Description and Participation

Through retailers in AIC’s service territory, the REEP Program offered rebates to customers for the following types of efficient products:

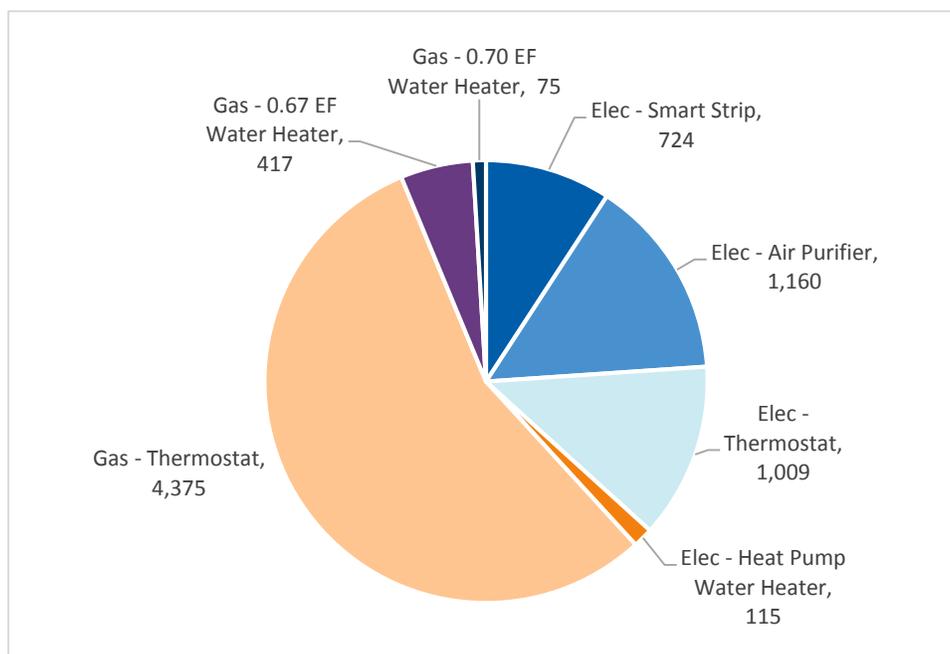
- Programmable thermostats
- Heat pumps or efficient gas water heaters
- Air purifiers
- Smart power strips

Program staff and participating retailers placed the rebate applications on or near qualifying products, and customers mailed applications to EFI. Customers also could download applications from the ActOnEnergy website.

The evaluation team’s review of the REEP Program-tracking database showed the program incentivized 8,275 total products among 7,875 participants. Figure 1 illustrates participation by product type. In PY6, the program realized higher participation for natural gas measures than electric measures (62% vs. 38%), with natural gas heating thermostats representing 56% of participation for the entire program.

Of participants purchasing a thermostat for natural gas heat, 89% used forced warm-air systems (furnaces). The projects saved gas and electricity, as the measure conserved heating source (natural gas) consumption and reduced runtimes of electric blowers.

Figure 1. PY6 Distribution of Participants among Measure Types



4.2 Process Assessment

Because AIC decided not to offer the program after PY6, the evaluation team conducted a limited process evaluation, primarily focusing on information collected during interviews with program stakeholders.

Program Design and Implementation

The PY6 REEP Program design and implementation did not change significantly from PY5. Program processes remained consistent, and the program offered the same measures offered at the end of PY5 (during PY5, the program dropped room air conditioners because predicted savings decreased significantly due to the new Statewide TRM Version 2 algorithm). According to all parties interviewed, program staffing proved sufficient to support program delivery.

As with the PY5 program, the evaluation team found the program design effective, leveraging the retailer relationships that APT maintained for the Upstream Lighting Program. In PY6, the REEP Program exceeded its overall energy-savings goals for both electric and gas, a further indication that program design operated effectively and that AIC and its partners implemented the program successfully. When speaking about the program delivery process, the program manager said, “...both CSG and EFI have kind of gotten it down to a science...and big box stores and everyone are working together. It’s one of those programs that has worked really smoothly, no hiccups or problems.” None of the interviewed stakeholders identified program delivery areas that AIC or program implementers could improve.

In addition to the program’s energy-savings goals, the program manager noted that REEP’s long-term goal sought to transform the energy-efficiency market—a goal the program shared with all AIC programs. Specifically, the program sought to increase the presence of measures offered through the program in local stores, so that customers would continue to purchase energy-efficient products in the program’s absence. Currently, data are not available that would allow the evaluation team to gauge progress toward this goal.

Measure Offerings

PY6 program measures retained the same rebate levels as those in PY5. Interviewed stakeholders reported rebate levels appropriate to motivate customers to purchase higher-efficiency products, and the selection of product models offered proved appropriate for the target audience.

Except for smart power strips, measures rebated through the program exceeded the energy-savings goal set for those measures. Programmable thermostats particularly proved very successful in PY6. Because they carry relatively high per-unit savings, elevated participation numbers served to offset lower-than-expected uptake of smart power strips. A program implementer credited high programmable thermostat participation to the hard winter experienced in PY6, in conjunction with the decreasing price of programmable thermostats.

Program managers and implementers offered opinions regarding why uptake of smart power strips fell short of program goals. As found during the PY5 evaluation, program managers and implementers reported that many customers did not understand the benefits of smart power strips and how they work to save energy. Given this misunderstanding, and the large selection of less-expensive power strips on store shelves, consumers experienced difficulties choosing the higher-priced smart power strips, even with the AIC rebate.

Implementers also reported a large reduction in the selection of power strips at some major retailers, possibly due to competition from regular power strips, customer misunderstanding of the benefits of smart power strips, and high return rates.

Evaluation Findings

Implementers noted that sales numbers began to decrease when product availability decreased. However, as smart power strips represent a relatively low percentage of overall program savings potential, program managers and implementers did not act to improve sales (e.g., by increasing rebate amounts or undertaking additional marketing efforts).

Lower-than-expected smart power strip participation remained consistent with findings from the PY5 evaluation. In the PY5 report, the evaluation team recommended using education and outreach efforts already in use for the Upstream Lighting Program to address this newer technology and to encourage customers to purchase smart power strips and use them correctly. Based on feedback from the program manager and implementers, AIC and the program implementers acted on this recommendation.

APT included smart power strip demonstrations during in-store promotional events it held for the Upstream Lighting Program. Personnel staffing the tables received training to answer questions about the REEP Program (and smart power strips, specifically). In addition to in-store demonstrations, AIC had a table at a state fair last year that included demonstrations of smart power strip use. Without further data on smart power strip sales and use by consumers listening to the demonstrations, the evaluation team cannot determine the demonstrations' effectiveness.

Participant Response

Though the evaluation team did not perform participant surveys as part of the PY6 REEP evaluation, the team asked interviewed stakeholders if they had received feedback from participating customers. APT, as the day-to-day operations contractor, had the most opportunity to interact directly with participating customers and provided their anecdotal feedback, reporting customers “love” and “appreciate” the program. No interviewed stakeholder reported receiving major complaints from customers. In addition, program implementers noted that the REEP Program offered an effective connection point between AIC and its customers, which provided ActOnEnergy programs retail exposure in more departments beyond lighting.

Program Data Tracking and Rebate Fulfillment

Participants mailed rebate applications to EFI, and EFI entered data from the forms into the program-tracking database. EFI's data processing system is designed to validate customers and measure eligibility, allowing EFI to ensure that participants are AIC customers, that the measure meets predetermined requirements, and that customers submitted the application within the appropriate time frame. If a customer or measure did not qualify for the program, EFI mailed the customer a letter explaining the reasons for their disqualification.

On a monthly basis, AIC received reports from program implementers. These reports included such information as progress toward measure-specific energy-savings goals. The program manager noted that, while reporting frequency was sufficient, they would have appreciated more frequent reporting. In addition, they wanted to receive the database itself rather than a paper report. This would allow AIC to run reports and create graphs as needed to support program management.

In reviewing the program-tracking database, the evaluation team found minor discrepancies in tracking of measure quantities. As in PY5, the PY6 tracking database consisted of the following four tables:

- Application_Data_Electric (the ADE table)
- Electric_Savings (the ES table)

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- Application_Data_Gas (the ADG table)
- Gas_Savings (the GS table)

Each table line item represented a program participant, with each using a unique project ID. The application data tables and the savings tables differed primarily in that application data tables (ADE and ADG) contained the equipment make, model, and purchase price for each project ID, while savings tables (ES and GS) contained ex ante gross impact savings for each ID.

As expected, the quantity of rebated products in the ADG table for each measure type exactly matched the quantity in the GS table. However, the evaluation team's review counted nine more thermostats in the ADE table than in the ES table (4,035 vs. 4,026). Upon closer review, we found that, for nine project IDs, the ADE table listed the quantities as two, where the ES table listed the quantities as one.

For the impact analysis, the evaluation team used the quantities listed in the ES and GS tables since they also tracked ex ante impact savings.

Store Participation

Program retailers included larger retail stores (e.g., Walmart, Lowe's, Home Depot, and Menards) and some smaller hardware store chains and cooperatives (e.g., Rural King and Ace Hardware). APT noted its field team continually searched for new retail opportunities due to its goal of creating a program presence wherever customers shop for the measures. For example, in PY6, Oreck, a popular vacuum manufacturer, joined as a retail partner. APT learned that Oreck also manufactures air purifiers, and APT worked with them to obtain permission to promote the program in Oreck's retail stores. Based on information in the program-tracking database, 566 unique retailer outlets sold products rebated through the PY6 REEP Program.

Program Marketing

The REEP Program's marketing approach did not change between PY5 and PY6. AIC marketed the program primarily through POP materials and rebate application forms, which APT and participating retailers maintained. One program implementer in particular noted that APT did very well in supplying and maintaining POP materials. In addition to POP materials, AIC sent e-mail blasts to customers, providing information about the REEP Program, and APT marketed the program through in-store demonstrations.

APT considered training retail staff as an important marketing aspect, as this induced sales people to talk to customers without program representatives present, and maintained a goal of having retail staff promote the program to everyone walking in the door.

Program Close

Program managers and implementers decided to close the REEP Program after PY6 because a majority of the measures would not pass the total resource cost (TRC) cost-effectiveness test after PY6. When CSG completed the cost-effectiveness analysis in PY4, Illinois had yet to adopt a TRM. Therefore, CSG primarily used assumptions from the ENERGY STAR website to determine the cost-effectiveness of program measures.

When Illinois adopted the TRM in PY5, several variables changed, such as incremental costs and savings algorithms, resulting in lower TRC results for several measures rebated through the REEP Program.

Evaluation Findings

As only programmable thermostats and heat pump water heaters (HPWHs) still passed the TRC test, AIC and program implementers chose to transfer programmable thermostats to the Home Performance with ENERGY STAR program and to discontinue rebates for HPWHs, given the few being installed.

According to all parties interviewed, the program's close proceeded smoothly. As listed on the rebate applications, the program ended on May 31, 2014, with all applications requiring a July 1 postmark to qualify for a rebate.

APT communicated details regarding the program's close to participating retailers and related to removing POP materials and rebate applications from stores. The APT field team visited all stores in May 2014, communicating to retail partners that the program was closing. APT removed all program materials from the stores by June 1 and provided additional training to retail staff; so that they knew customers could still download rebate applications from the ActOnEnergy website to participate in the program before the end of May.

In addition to listing the program's end date on rebate applications and removing POP materials and applications from stores, AIC sent an e-mail blast to customers informing them of the program's end. AIC also posted this information on the program website for a month or two prior to closing the program.

Though the program's close was clearly communicated to customers, as described above, EFI received a number of applications after the June 30 deadline, which AIC expected would occur. AIC decided, to maintain high customer satisfaction levels, it would pay rebates on applications received after the deadline, provided that the equipment had been purchased prior to May 31, 2014. AIC did not claim participation or savings for these measures.

4.3 Impact Assessment

4.3.1 Gross Impacts

Based on the verified number of measures rebated through the program in PY6, the REEP Program achieved total ex post gross energy and demand savings of 63,570 therms, 1,230 MWh, and 124 kW. As discussed in earlier sections, the evaluation team estimated per-unit gross savings for every database measure using Statewide TRM Version 2 algorithms, and applied PY4 verification rates to the total number of measures for each measure type. The team calculated the gross impacts for each measure type by multiplying the average per-unit gross savings by the verified number of measures. Table 7 presents the gross savings results.

Table 7. PY6 Program Ex Post Gross Impacts

Measure	Measure Quantity	Verified Measure Quantity	Per-Unit Impact			Gross Impacts		
			kWh	kW	Therms	MWh	MW	Therms
Programmable Thermostat								
Gas Heat	4,545	2,545	N/A	N/A	21	N/A	N/A	96,896**
Electric, Gas Heat Runtime	4,026	2,255	20	0.00	N/A	82**	0.000	N/A
Electric Heat	1,054	590	465	0.00	N/A	490**	0.000	N/A
Subtotal	9,625*	5,390*	486	0.00	21	573	0.000	96,896
Smart Power Strip	857	394	57	0.01	N/A	22	0.003	N/A
Air Purifier	1,212	1,212	562	0.06	N/A	681	0.078	N/A
.67 Water Heater	417	417	N/A	N/A	24	N/A	N/A	10,210
HP Water Heater	115	115	2,336	0.11	N/A	269	0.013	N/A
.70 Water Heater	75	75	N/A	N/A	27	N/A	N/A	2,005
Total	12,301*	7,314*	n/a			1,545	0.093	109,111

* These totals include the overlapping thermostats that were included in the gas and electric database (i.e., thermostats controlling gas furnaces). Results may not sum to totals due to rounding differences.

** Value calculated using ex ante quantities (not verified quantities) as the per-unit impact calculation incorporates in-service rates.

The following sections discuss the engineering analysis estimating each measure’s average per-unit impact.

Air Purifiers

The evaluation team calculated gross per-unit energy and demand savings for ENERGY STAR room air purifiers. The program-tracking database listed all unique model numbers installed in PY6, along with their corresponding quantities and clean air delivery rates (CADRs) for three pollutants; dust, tobacco smoke, and pollen. Since the Statewide TRM Version 2 bases deemed impact savings on a nondescript CADR, the evaluation team calculated an overall CADR for each unit as the average of each unit’s dust, tobacco smoke, and pollen CADR values. The average capacity rating for all units tracked was 143 CADR. Table 8 shows the quantity and percentage of all rebated units in PY6 for each CADR size category provided in the Statewide TRM Version 2. The Statewide TRM Version 2 provides savings estimates for each CADR bin, shown in Table 8.

Table 8. PY6 Quantities of Air Purifiers by CADR

CADR	Quantity Rebated	Percent of Rebated Units	TRM Per-Unit Energy Savings (kWh)	TRM Per-Unit Demand Savings (kW)
50-100	148	12.2	268	0.031
101-150	644	53.1	525	0.060
151-200	320	26.4	714	0.081
201-250	14	1.2	902	0.103
> 250	86	7.1	437	0.050
Total	1,212	100.0	-	-

Evaluation Findings

The Statewide TRM Version 2 cites the ENERGY STAR Qualified Room Air Cleaner Calculator as the source for the deemed savings shown in Table 8. Using these savings estimates for each CADR bin, the evaluation team assigned energy and demand savings for all 1,212 rebated measure line items, and then calculated a weighted average savings, by sales, to determine the average per-unit energy and demand savings for air purifiers. Table 9 shows the results.

Table 9. Per-Unit Gross Annual Savings for Air Purifiers

Parameters (Units)	Results
Ex Ante Per-Unit Energy Savings (kWh/year)	548.70
Ex Post Per-Unit Energy Savings (kWh/year)	562.27
Per-Unit Energy Realization (%)	102
Ex Ante Demand Savings (kW/year)	0.063
Ex Post Demand Savings (kW/year)	0.064
Per-Unit Demand Realization (%)	102

In PY6, 71 unique model numbers comprised the 1,212 total rebated air purifiers. The program database tracked CADRs for only 35 unique model numbers. The evaluation team referenced manufacturer websites or the ENERGY STAR product-searchable database to determine the values for the remaining 36 models.

The PY6 ex post per-unit energy and demand savings aligned very well with the ex ante estimation, varying only 2% from the tracking database’s deemed annual impacts. Determining the additional CADR values most likely caused the 2% difference in the realization rate, as the ex ante calculations could have omitted these values or used another method in estimating them.

Gas Water Heaters

The PY6 program provided rebates for 492 gas water heaters: 417 with a 0.67 energy factor (EF) and 75 with a 0.70 EF. For each rebated unit, the program tracked unit model numbers, volumes (gallons), unit input ratings (Btuh), and unit EFs. Table 10 shows the number of PY6 rebates processed for each gas water heater size and rebate level.

Table 10. PY6 Quantities of Gas Water Heaters Rebated

Rebate Level	29 Gallons	40 Gallons	50 Gallons	75 Gallons	Total
\$50 (EF ≥ 0.67)	0	154	262	1	417
\$75 (EF ≥ 0.7)	36	12	27	0	75
Total	36	166	289	1	492

In PY6, 44 unique model numbers comprised the 492 total rebated gas water heater units. The program database tracked the volume and EF for only 30 unique model numbers. The evaluation team referenced manufacturer websites or the ENERGY STAR product-searchable database to determine per unit savings values for the remaining 14 unique models rebated through the program. Once the evaluation team collected all necessary variables, the following formula, specified in the Statewide TRM Version 2, provided calculated savings:

Evaluation Findings

$$\Delta Therms = \left(\frac{1}{EF_{base}} - \frac{1}{EF_{ee}} \right) \times \frac{GPD \times 365.25 \times \gamma_{water} \times (T_{out} - T_{in}) \times C_{p,water}}{100,000} \quad (2)$$

Where:

EF_{base} = energy factor of existing water heater (TRM estimation: $EF_{base} = 0.67 - (0.0019 * \text{Storage Volume})$)

EF_{ee} = energy factor of new water heater

GPD = gallons per day of hot water (TRM assumes 50 gal/day)

γ_{water} = the specific weight of water (8.33 lbs/gal)

T_{out} = water temperature of water heater output (TRM assumes 125 °F)

T_{in} = water temperature of water heater input (TRM assumes 54 °F)

$C_{p,water}$ = the specific heat capacity of water (1.0 BTU/(lb* °F))

Table 11 shows the results.

Table 11 Per-Unit Gross Annual Savings for Gas Water Heaters

Parameter (units)	Results
Ex Ante Energy Savings $EF \geq 0.67$ (therms/year)	23.28
Ex Post Energy Savings $EF \geq 0.67$ (therms/year)	24.48
Per-Unit Energy Realization $EF \geq 0.67$ (%)	105
Ex Ante Energy Savings $EF \geq 0.7$ (therms/year)	30.19
Ex Post Energy Savings $EF \geq 0.7$ (therms/year)	26.73
Per-Unit Energy Realization $EF \geq 0.7$ (%)	89

The PY6 ex post per-unit energy savings for 0.67 EF water heaters aligned very well with the ex ante estimation, varying only 5% from the tracking database's deemed annual kWh savings value. The ex post per-unit energy savings for 0.7 EF water heaters, however, was 11% lower than the ex ante value, primarily due to the high number of small-volume water heaters in the 0.7 EF population. The Statewide TRM Version 2 cited the Code of Federal Regulations⁴ for estimating the baseline EF for gas water heaters. The equation assigned a higher baseline efficiency for small-volume water heaters, resulting in lower savings when compared to large tanks. The 0.7 EF water heater population was 48% small tanks (29 gallons), compared to 0% for 0.67 EF tanks.

Heat Pump Water Heaters

Six unique model numbers comprised the 115 total rebated heat pump water heater units in PY6. The program database tracked the volume and EF for only two unique model numbers. The evaluation team referenced manufacturer websites or the ENERGY STAR product-searchable database to determine per unit savings values for the remaining four models rebated through the program. Table 12 shows distributions of HPWH units rebated by EF and size.

⁴ The Electronic Code of Federal Regulations (e-CFR) Data is current as of September 4, 2014. Website: <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=4244256deb6e3f16076e5cb34c6b93d9&rgn=div8&view=text&node=10:3.0.1.4.18.3.9.2&idno=10>.

Table 12. PY6 Quantity of HPWH Rebates

Energy Factor	40 Gallons	50 Gallons	60 Gallons	80 Gallons	Total
2	1	0	0	0	1
2.33	0	0	0	1	1
2.35	0	1	0	0	1
2.4	0	100	4	0	104
2.45	0	8	0	0	8
Total	1	109	4	1	115

The team used the following Statewide TRM Version 2 algorithm to estimate per-unit annual energy savings:

$$\Delta kWh = \left(\frac{1}{EF_{base}} - \frac{1}{EF_{ee}} \right) \times \frac{GPD \times (T_{out} - T_{in}) \times 365 \times 8.33 \times 1.0}{3,412} + Cooling kWh - Heating kWh \quad (3)$$

Inputs needed for this analysis included the installed unit EF_{ee} (supplied by the tracking database) and several assumptions provided by the Statewide TRM Version 2, including baseline EF_{base} (calculated by empirical equations, based on the volume of units), average daily water use (GPD) (50 gal/day), and cold and hot household water temperatures (T_{in} and T_{out} , 54°F and 125°F, respectively).

As specified in the formula, cooling kWh savings resulted from the conversion of heat inside a conditioned space to water heat. Similarly, heating kWh served as a heating energy penalty for electrically heated homes due to the conversion of heated air to water heat.

Per the following two formulas:

$$Cooling kWh = \left(1 - \frac{1}{EF_{ee}} \right) \times \frac{GPD \times (T_{out} - T_{in}) \times 365 \times 8.33 \times 1.0}{3,412} \times \frac{LF \times 0.27 \times LM}{COP_{cool}} \quad (4)$$

$$Heating kWh = \left(1 - \frac{1}{EF_{ee}} \right) \times \frac{GPD \times (T_{out} - T_{in}) \times 365 \times 8.33 \times 1.0}{3,412} \times \frac{LF \times 0.49}{COP_{heat}} \quad (5)$$

Where:

COP = coefficient of performance: the actual COP of the cooling system or, if unknown, 3.08 (10.5 SEER ÷ 3.412)

LF = Location Factor, defined as: 1.0 for HPWH installation in a conditioned space, 0.5 for HPWH installation in an unknown location, and 0.0 for installation in an unconditioned space

LM = Latent multiplier to account for latent cooling demand = 1.33⁵

Estimates of heating and cooling savings required information about the location of installed HPWHs and the efficiency and type of the homes' cooling and heating systems. As the database did not track this information, the evaluation team used the Statewide TRM Version 2 assumptions that 50% of the HPWH units were in conditioned spaces and the average cooling equipment COP was 3.08. The evaluation team used data from the U.S. Energy Information Administration regarding heating system distributions in Illinois and the Midwest

⁵ A sensible heat ratio (SHR) of 0.75 corresponded to a latent multiplier of 4/3 or 1.33. An SHR of 0.75 is common for a typical, split system (from page 10 of "Controlling Indoor Humidity Using Variable-Speed Compressors and Blowers" by M. A. Andrade and C. W. Bullard, 1999). Online at: www.ideals.illinois.edu/bitstream/handle/2142/11894/TR151.pdf.

Evaluation Findings

Census Region to estimate distributions of heat pumps (1.7%) and electric resistance (8.6%) as primary heating systems among the program sample.⁶

The evaluation team determined peak demand savings using the Statewide TRM Version 2 supplied assumptions for the summer peak coincidence factor (12%) and full-load hours of water heating (2,533 hours), with the results shown in Table 13.

Table 13. Per-Unit, Gross, Annual Savings for HPWHs

Parameter (units)	Results
Ex Ante Energy Savings (kWh/year)	2,300.82
Ex Post Energy Savings (kWh/year)	2,336.23
Per-Unit Energy Realization (%)	102
Ex Ante Demand Savings (kW/year)	0.109
Ex Post Demand Savings (kW/year)	0.111
Per-Unit Demand Realization (%)	102

Programmable Thermostats

In PY6, the evaluation team performed three separate and independent analyses for programmable thermostat savings: electric heat savings (n=1,054 thermostats), gas heat savings (n=4,545 thermostats), and electric fan savings of gas furnaces (gas heat runtime, n=4,026 thermostats). The evaluation team used the Statewide TRM Version 2 assumption that 50% of electrically heated homes have electric resistance heat, while the other half have heat pumps. For single-family (SF) vs. multifamily (MF) distribution, the team used data collected from the U.S Energy Information Administration in Illinois in 2010⁶ to assume a 72% SF vs. 28% MF distribution.

The evaluation team assumed the same SF vs. MF distribution for the gas heat (Δ therms) and gas heat runtime (Δ kWh) savings analyses. These analyses did not require assumptions about equipment types.

The evaluation team used look-up tables in the Statewide TRM Version 2 Section 5.3.10 to determine all variables for Statewide TRM Version 2 calculations for thermostat savings. We derived the household factor from a weighted average taken via the SF-MF distribution noted above. The Statewide TRM Version 2 specified an effective in-service rate of 56% for non-direct install programs. To determine electric and gas heating consumption for each project ID, the evaluation team mapped participant zip codes to the appropriate Statewide TRM Version 2 weather station, according to the mapping guidelines in Section 3.7 of the Statewide TRM Version 2. Table 14 summarizes the distribution and Statewide TRM Version 2 consumption assumptions by weather station.

⁶ <http://www.eia.gov/consumption/residential/data/2009/xls/HC2.9%20Structural%20and%20Geographic%20in%20Midwest%20Region.xls>.

Table 14. PY6 Heat Consumption and Program Distribution by Weather Location

Weather Location	Elect Heat Participant Distribution	Gas Heat Participant Distribution	Gas Heat Runtime Participant Distribution	Elec Heat, kWh (TRM)*	Gas Heat, therms (TRM)
IL-Rockford	0.0%	0.0%	0.0%	19,529	889
IL-Chicago*	15.9%	21.8%	22.9%	18,657	849
IL-Springfield	41.5%	49.9%	49.0%	15,978	727
IL-Belleville	41.7%	28.3%	28.1%	12,326	561
IL-Marion	0.9%	0.0%	0.0%	12,545	571

* According to the Statewide TRM Version 2, the Chicago weather location extends west to the Iowa border and south to Peoria.

Using these values, the evaluation team calculated the weighted, average per-unit kWh, kW, and therms savings for all three possible thermostat applications, using the quantity of installs per site. Table 15 presents the results. Since the evaluation team did not have access to any methodology or assumptions for the thermostat deemed savings, the low realization rates are likely attributed to the geographical distribution of project participants. A larger program population in the Rockford and Chicago weather station regions would increase the ex post savings.

Table 15. Per-Unit Gross Annual Savings Programmable Thermostats*

Analysis	Parameter (units)	Results
Electric Heat	Ex Ante Energy Savings (kWh/year/unit)	615.72
Electric Heat	Ex Post Energy Savings (kWh/year/unit)	465.32
Electric Heat	Per-Unit Realization (%)	76
Gas Heat Runtime	Ex Ante Energy Savings (kWh/year/unit)	25.78
Gas Heat Runtime	Ex Post Energy Savings (kWh/year/unit)	20.42
Gas Heat Runtime	Per-Unit Realization (%)	79
Gas Heat	Ex Ante Energy Savings, PY6 Estimate (therms/year/unit)	28.02
Gas Heat	Ex Post Energy Savings (therms/year/unit)	21.32
Gas Heat	Per-Unit Realization (%)	76

* The current Statewide TRM Version 2 does not consider cooling savings from programmable thermostats.

Smart Power Strips

The Statewide TRM Version 2 (Section 5.2.1) presents savings associated with smart power strips as deemed values. Five-plug units are deemed to save 56.5 kWh/year, while seven-plug units save 103 kWh/year. Demand savings assumed 7,129 hours of use per year and a 0.8 summer peak coincidence factor.

In PY6, 72 unique model numbers comprised the 857 total smart power strip rebated units. The program database recorded model numbers, but did not include information regarding the number of plugs. The evaluation team searched retail consumer electronics websites to identify the number of plugs for each smart power strip rebated through the program. The analysis assumed a linear relationship between the number of plugs and the magnitude of energy savings to extrapolate savings from Statewide TRM Version 2 assumptions to each rebated measure. Table 16 shows the distribution of rebated smart power strips by plug count and the associated per unit annual savings used to calculate gross impacts.

Table 16. PY6 Smart Strip Distribution by Plug Count

# of Plugs	Program Distribution	Annual Energy Savings (kWh)	Annual Demand Savings (kW)
3	3.5%	30.86	0.003
4	40.4%	47.59	0.005
5	43.6%	56.50	0.006
6	7.6%	81.05	0.009
7	3.5%	103.00	0.012
9	1.4%	131.25	0.015

The evaluation team calculated a per-unit energy and demand savings for power strips rebated through the program as the weighted average savings across the different plug counts. Table 17 shows the results. The team attributes the high realization rate to the distribution of plug counts. Savings increased with the number of plugs in a strip, and 96.5% of the sample had plug counts corresponding to higher energy and demand savings than the ex ante values.

Table 17. Per-Unit Gross Savings for Smart Strips

Parameter (units)	Results
Ex Ante Energy Savings (kWh/year)	36.69
Ex Post Energy Savings (kWh/year)	56.54
Per-Unit Energy Realization (%)	154
Ex Ante Demand Savings, PY6 Fixed Per-Unit Savings (kW/year)	0.004
Ex Post Demand Savings (kW/year)	0.006
Per-Unit Demand Realization (%)	155*

* Calculated realization rate may vary slightly due to rounding.

4.3.2 Net Impacts

Table 18 shows the REEP Program’s free-ridership, spillover, and NTGR results calculated by the evaluation team for the PY4 evaluation. The team estimated free-ridership for each measure using responses from the PY4 participant survey, then weighted the results by verified program product savings to estimate overall PY4 free-ridership. Estimated spillover in PY4 resulted from summing estimated savings for each spillover measure reported by survey participants, then dividing by the sum of all verified REEP Program gross savings for the surveyed participants. In PY4, for reporting purposes and prospective use, the team grouped measures into two sets of electric measures and one set of gas measures, balancing NTGR precision and allowing variety among measures.

Table 18. REEP Program NTGRs

Measure	Responses (n)	Free-Ridership	Spillover	NTGR
Room AC/Dehumidifier/Air Purifier	65	0.31	0.09	0.78
Thermostat—Electric Heat/Thermostat—AC/Power Strips/Heat Pump Water Heater	97	0.23	0.09	0.86
Gas Measures	28	0.32	0.21	0.90
Total	190	0.30	0.14	0.84

Table 19 shows ex ante and ex post net impacts and factors, such as NTGR, required for their calculation.

Table 19. PY6 Ex Ante and Ex Post Net Program Impacts

Measure	Savings Type	Ex Ante			Verification Rate	Ex Post			Net Realization Rate****
		Gross Savings*	NTGR	Net Savings*		Gross Savings**	NTGR	Net Savings***	
Programmable Thermostat AC and Gas Heat	Therms	127,351	0.90	114,616	56%	96,896	0.90	87,207	76%
	MWh	104	0.86	89		82	0.86	71	79%
	MW	0	0.86	0		0	0.86	0	0%
Programmable Thermostat Electric Heat	MWh	649	0.86	558	56%	490	0.86	422	76%
	MW	0	0.86	0		0	0.86	0	0%
Heat Pump Water Heater	MWh	265	0.86	228	100%	269	0.86	231	102%
	MW	0.013	0.86	0.011		0.013	0.86	0.011	102%
0.67 Water Heater	Therms	9,708	0.90	8,737	100%	10,210	0.90	9,189	105%
0.70 Water Heater	Therms	2,264	0.90	2,038	100%	2,005	0.90	1,804	89%
Air Purifier	MWh	665	0.78	519	100%	681	0.78	532	102%
	MW	0.076	0.78	0.059		0.078	0.78	0.061	102%
Smart Power Strip	MWh	31	0.86	27	46%	22	0.86	19	71%
	MW	0.004	0.86	0.003		0.003	0.86	0.002	71%
Total Program	Therms	139,323	0.90	125,391		109,111	0.90	98,200	78%
	MWh	1,714	0.83	1,421		1,545	0.82	1,274	90%
	MW	0.092	0.79	0.073		0.093	0.79	0.074	101%

* Ex ante results calculated using values assumed by the program implementer.

** Adjusted for verification rate.

*** Ex post results calculated using verified installation rates, ex post per-unit savings, and PY4 NTGR. Results may not total due to rounding.

**** Net realization rate = ex post net savings ÷ ex ante net savings. Results may differ due to rounding.

4.4 Conclusions and Recommendations

Overall, the PY6 REEP Program worked well:

- AIC, CSG, APT, and EFI effectively collaborated to successfully administer and deliver the program to participating customers.
- The program manager and implementers did not identify major challenges or participation barriers (other than a lack of customer understanding regarding smart power strips).
- Program marketing, primarily POP materials and rebate applications, generated sufficient program awareness.
- The program exceeded overall energy electric and gas savings goals.

The evaluation team identified some issues in the tracking database, including incomplete equipment details, inconsistencies between different worksheets in the database, and a lack of detail regarding ex ante savings calculations.

Evaluation Findings

According to interviews with program stakeholders, the REEP program is designed to transform the market for qualifying measures, creating availability and consumer demand for energy-efficient models. Since AIC suspended this program after PY6, ongoing monitoring should assess the degree to which markets have been transformed. AIC could consider collaborating with previously participating retail stores, many of which participate in the Upstream Lighting Program, and ask them to track whether sales of these products continue at current levels or drop after the program's end. The information could prove useful for estimating future spillover from AIC's portfolio.

Though AIC will not offer the REEP Program in PY7, the evaluation team offers the following recommendations for AIC's consideration as they may be applicable to other programs:

- **Consider consolidating the four-part tracking database into two parts.** The application data table and the savings table should be combined into one database for each program type (electric and gas). The evaluation team's review found quantity discrepancies between the two worksheets in the tracking database. Consolidating the tables would provide quality assurance by eliminating possible discrepancies in tracking data.
- **Complete specification tracking for all equipment model numbers.** The program thoroughly tracked the make and model number of all appliances, but incompletely tracked equipment details and specifications used for sizing and as inputs to savings calculations. Section 4.3.1 details the evaluation requirements missing from the database for PY6.
- **Include detailed calculations and assumptions for ex ante per-unit energy and demand savings.** For a more accurate impact analysis, the evaluation team should better understand the implementer's methodology for claimed savings.
- **Create an online database that program managers or evaluation staff could access to obtain program updates as needed** (and as noted in previous evaluations across AIC's residential portfolio). AIC staff would like more frequent reports and copies of the database during program implementation.
- **Consider leveraging existing marketing opportunities**, such as general program marketing materials, in-store promotional activities for the Upstream Lighting Program, and AIC's presence at state fairs. This would continue to educate consumers about the benefits of energy-efficient products, especially smart power strips, thus serving to further the market transformation goal shared by all AIC programs and creating spillover for AIC's energy-efficiency portfolio.

A. Appendix - Data Collection Instruments

AIC REEP Program PY6 Interview Guide (AIC, CSG, APT, EFI)

Table 20. Researchable Questions Mapped to Interview Guide

Researchable Question	Indicators/Areas of Investigation	Questions
A. Did the program meet its goals? If not, why not?	<ul style="list-style-type: none"> Program goals v. achieved participation and savings 	3-5
B. Was the program design and delivery effective?	<ul style="list-style-type: none"> Are program design and implementation processes effective according to program managers and implementers? Is the program implemented as designed? Is communication between parties effective? Is marketing sufficient to meet goals? Program manager and implementer views on barriers to participation. Customer response, according to program manager and implementer. 	2, 6, 8-33
C. What are future plans for the program or measures included in the program?	<ul style="list-style-type: none"> Was the program discontinued after PY6? If no, how is the program different in PY7? 	7

Name of Interviewee, Title:	Date:
Program:	Program:

Interview Introduction

The questions I have for you today are designed to help the evaluation team gain insight into how the REEP Program was implemented in PY6 and to gain insight into the experiences of [program managers OR implementers]. We will ask questions about program status with respect to goals, design and implementation effectiveness, program marketing, and barriers. This interview will provide key inputs that the process evaluation team can use to document the evolution of the program over this sixth year. And your insights are much appreciated.

[EFI only asked highlighted questions.]

Program Design and Roles

1. First, can you please describe your role in the Residential Energy-Efficient Products program?
2. Who else do you work with to help deliver the program? (Probe for AIC, CSG, APT, EFI as appropriate.)
 - a. Please provide a general overview of the roles and responsibilities of these other parties.
 - b. Was this staffing arrangement sufficient, or do you think additional staff were needed to support program delivery? [If not sufficient] In which roles were additional staff needed?
3. What were the primary goals and objectives of the Residential Energy-Efficient Products Program for PY6? (Probe for participation and savings targets by product.)
4. How were these targets set?
5. Did the program meet its goals in PY6?
 - a. Why do you think that is?

Program Delivery

6. Did the program change significantly between PY5 and PY6?
 - a. [IF YES] What changes were made and why?
7. At the end of last year we were told you do not plan to continue this program past PY6. Is that still the case?
 - a. Why or why not?
 - b. [IF PROGRAM CONTINUED] What changes did you make for the PY7 program year?
8. Did the program delivery process work well in your opinion?
9. Were there areas in program delivery that could be improved?
10. How did the REEP Program interact with other AIC programs?
11. Do you think the selection of product models that was offered was appropriate for the target audience?
 - a. [IF NO] What would you have liked to be different?
12. Did the rebate levels change in PY6 compared to PY5?
13. Do you think the rebate levels were appropriate to motivate customers to purchase higher efficiency products?
 - a. [IF NOT COVERED ABOVE] Do you think different rebate levels would be more effective?
14. Which products were the most successful in PY6?
 - a. Why do you think that is?
15. Have any products sold more or less than expected?
 - a. Why do you think that is?
16. Was the program budget for PY6 sufficient to support implementation and achievement of the program goals?
17. About how long does it take for customers to receive their rebate check?

Data Tracking

18. How were program data tracked?
 - a. Did this process work well? If not, what do you think should change?
19. How do you use the database? What analyses are done? What do you look for?
20. [FOR EFI ONLY] Can you provide size and efficiency information for each model in the tracking database?

Communication, Outreach, and Marketing

21. [IF DISCONTINUED AFTER PY6] How did you communicate the program's ending to retailers, to customers?
 - a. Did that work well?
22. How has the relationship been with [AIC, CSG, APT, EFI, as appropriate] this past year?
 - a. How frequently did you communicate?
 - b. Using what methods?
 - c. What worked well and what could be improved?
23. Did the relationship with the participant stores work well?
 - a. If not, what do you think needed to change, and how?
24. Did you target any additional stores in PY6? If so, why?
25. Did your marketing approach or materials change between PY5 and PY6? If so, how?
 - a. [IF YES] (Request new marketing materials.)
 - b. How was the program marketed in PY6? [Keep them focused on the "product" portion as it overlaps with lighting – they may talk about education events, so double check that these were not just lighting events.]
 - c. Did you have clearly defined marketing targets, objectives, and goals for PY6? If so, what were they?
 - d. Did you tailor tactics and messages to different customer segments or different seasons?
26. In PY4 and PY5, we found that customers lack awareness about the benefits of smart power strips and how to use them. In PY5, we recommended leveraging education and outreach efforts already in use for the lighting program as a means of addressing this newer technology and encouraging customer to purchase smart power strips and to use them correctly. Did PY6 in-store demonstrations or other education and outreach events include a smart strip component?
27. Have you identified any other specific market barriers for this program?
 - a. [IF YES] What barriers have you identified?
 - b. [IF YES] Did you develop specific approaches to mitigate those barriers?

Customer Response

28. What do customers say about the program?
29. Have there been any major problems or complaints?
 - a. How were these addressed, and what are the trends?
30. Have there been any major successes? What were they?
31. Do you think that customers' awareness of the program has increased this past year?
 - a. What evidence have you seen?

Wrap Up and Data Request

32. [IF NOT COVERED ABOVE] What are the program's biggest challenges and successes?
33. Is there anything we haven't discussed that you would like to add?
34. What would you like to learn from this evaluation?

35. [FOR AIC PM] Finally, there are a couple of items, some of which we have already discussed, that I would like to request. I would be happy to send you an email with this list, if that would be easier.
- a. List of participant retailers
 - b. Whom would you suggest I speak with at APT and EFI? Can you provide their contact information?
 - c. PY6 goals (participation and savings)by product or fuel type, as available
 - d. Copy of the rebate application form
 - e. List of retail (non-lighting or at least where other products were featured) education events, with specifics on location and number of people attending, if available
 - f. Copy of retail education materials
 - g. Copy of marketing materials, if different than PY5
 - h. Implementer progress and summary reports

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