



IMPACT AND PROCESS EVALUATION OF 2011 (PY4) AMEREN ILLINOIS COMPANY EFFICIENT PRODUCTS PROGRAM

Final

Prepared for:

AMEREN ILLINOIS COMPANY

Prepared by:

THE CADMUS GROUP

Under Contract to

OPINION DYNAMICS

1999 Harrison Street
Suite 1420
Oakland, CA 94612
(510) 444-5050

www.opiniondynamics.com

Contact: Mary Sutter, Vice President of Energy Evaluation

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1. EXECUTIVE SUMMARY

Ameren Illinois Company's (AIC's) Energy Residential Efficient Products Program (REEP), which has historically offered energy-efficient product rebates through the upstream lighting program, became its own program in Program Year 4 (PY4), which covered the period of June 1, 2011 to May 31, 2012. Through retailers in AIC's service territory, the program offers customers the following types of efficient products:

- Programmable thermostats
- Heat pump or efficient gas water heaters
- Air purifiers
- Dehumidifiers
- Room air conditioners
- Smart power strips

Customers apply for rebates at the time of purchase, with the rebate application attached to the product, making the process easier for customers to submit paperwork. The expected savings from this program were 1% of the overall PY4 portfolio of electric savings and 2% of PY4 portfolio therm savings.

The evaluation team verified REEP participation and measure installation by contacting 190 randomly selected customers. We computed gross impacts by multiplying the fixed values from the Order for Docket 10-0568. This program is new as a separate program, as AIC implemented it for three years, combined with residential lighting. While the basic program design is similar, AIC added a number of measures not previously incented. As per the evaluation plan, the net-to-gross-ratio (NTGR) was determined by analyzing self-reported data from a participant survey and applying these retrospectively to PY4.

Impact Results

Table 1 outlines PY4 program participation levels. Verification rates were high for most measures in this program. Survey results indicate only a small percentage of programmable thermostats and dehumidifiers were not installed. The survey also indicated a significant percentage of both programmable thermostats and smart power strips are not being used to save energy. *Ex post* realized savings only count the proportion of thermostats and smart power strips estimated to be used in an energy-efficient manner.

Table 1. Summary of Program Verification Results

Measure	Unit	Program Participation* (N)	Installed Products	Products In Use For Energy Savings	Verification Rate
Programmable Thermostat	Each	3,730	3,655	1,977	53%
Heat Pump Water Heater	Each	73	73	73	100%
0.67 Water Heater	Each	243	243	243	100%
0.70 Water Heater	Each	27	27	27	100%
Air Purifier	Each	907	907	907	100%
Dehumidifier	Each	120	112	112	93%
Room Air Conditioner	Each	5,554	5,554	5,554	100%
Smart Power Strip	Each	1,482	1,482	682	46%

*Number of rebates.

Table 2 shows the PY4 program *ex ante* and *ex post* net impacts. We calculated *ex ante* impacts for all products using the fixed unit savings values and NTGRs from Commission Order for Docket 10-0568. These *ex ante* savings all assumed a 100% verification rate, except for programmable thermostats, which assumed an 86% verification rate to account for those not programming the thermostats. For *ex post* results, we applied verification rates outlined in Table 1 and NTGRs outlined in Table 13, determined through our estimates of free ridership and spillover from the participant surveys.

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

Measure	Savings Type	Ex Ante Gross Savings	Ex Ante NTGR	Ex Ante Net Savings	Verification Rate	Verified Gross Savings	NTGR	Ex Post Net Savings	Net Realization Rate
Programmable Thermostat AC and Gas Heat	Therms	205,958	0.87	179,183	53%	109,158	0.90	98,634	55%
	MWh	361	0.87	314	53%	192	0.86	165	52%
	kW	184	0.87	160	53%	98	0.86	84	52%
Programmable Thermostat Electric Heat	MWh	509	0.87	443	53%	270	0.86	232	52%
	kW	0	0.87	0	53%	-	0.86	-	N/A
Heat Pump Water Heater	MWh	132	0.76	100	100%	132	0.86	113	113%
	kW	6	0.76	5	100%	6	0.86	5	113%
0.67 Water Heater	Therms	5,589	0.58	3,242	100%	5,589	0.90	5,050	156%
0.70 Water Heater	Therms	837	0.58	485	100%	837	0.90	756	156%
Air Purifier	MWh	519	0.76	394	100%	243	0.78	190	103%
	kW	326	0.76	247	100%	28	0.78	22	103%
Dehumidifier	MWh	28	0.76	21	93%	26	0.78	20	96%
	kW	6	0.76	5	93%	6	0.78	5	96%
Room Air Conditioner	MWh	578	0.76	439	100%	578	0.78	451	103%
	kW	183	0.76	139	100%	183	0.78	143	103%
Smart Power Strip	MWh	262	0.76	199	46%	121	0.86	104	52%
	kW	29	0.76	22	46%	14	0.86	12	52%
Total Program ^c	Therms	212,384	0.86	182,911		115,584	0.90	104,440	57%
	MWh	2,113	0.81	1701		1560	0.82	1275	75%
	kW	437	0.81	352		334	0.80	270	77%

^a Ex ante results are calculated using the same fixed unit values as the ex post results, without adjustment for verified purchase or installation rates.

^b Ex post results are calculated using verified purchase, installation, and usage rates and new NTGR estimates.

^c Total program results may not exactly match the sum of the program results due to rounding.

Process Evaluation Results

Overall, the Residential Energy Efficient Products Program has worked as intended. Retailers play an important role in the program, as the majority of customers learned of the program through

visits to retail establishments. Customers are overwhelmingly satisfied with the available products, rebate process, and the overall program. The primary improvement area customers identified was increased program advertising. Customer surveys revealed many products served as replacements for products still in good condition. The program's NTGR is relatively high, compared to other utility programs, though this may be due in part to the product mix, which includes smart power strips, programmable thermostats, and heat pumps, water heaters, which have a low free ridership rate (and are not included in many appliance rebate programs). Another factor affecting free ridership is these measures also have higher incentives relative to purchase costs. Surveyed participants also reported significant spillover (21% on the gas measures and 8% on the electric measures).

Key recommendations include the following:

Contractors should be included in the program. AIC should consider expanding its reach to contractors as another advertising channel for the program, particularly regarding water heaters. Established trade ally programs can greatly benefit utilities through harnessing knowledgeable contractors, and through leveraging their resources in a way benefitting utilities, customers, and contractors.

AIC should focus on explaining benefits from the programmable thermostat and power strip. Survey results suggest customers express interest in these products, but many use them as they used their older products, rather than in the intended (and more efficient) manner. Leveraging education and outreach efforts already in use for lighting products could also address proper use of these products to help customers use them correctly.

2. INTRODUCTION

The Residential Efficient Products Program (REEP), which historically has offered energy-efficient product rebates through the upstream lighting program, expanded its offerings in PY4 (covering the period June 1, 2011 through May 31, 2012).

Through retailers in AIC's service territory, the program offers customers an array of ENERGY STAR® and other efficient products, as listed in Table 3. Retailers include larger retail stores (such as Walmart) and some smaller hardware store chains (such as Ace and Rural King).

Customers apply for rebates at the time of purchase, with the rebate application attached to the product, making the process easier for customers to submit paperwork. To qualify for rebates, customers must also submit their AIC utility bills.

The program primarily seeks to create a stronger market for efficient products by exposing them to a wide variety of customers. The current suite of measures ranges from simple and easy-to-install items to more complex products, requiring professional installation. Products address electric or gas customers,¹ with a wide range of rebate amounts offered; both gas and electric customers qualify for programmable thermostats.

Table 3. Efficient Products Available in Program Year 4 (PY4)

Product	Rebate Amount
Programmable Thermostat	\$25
Heat Pump Water Heater	\$300
0.67 Water Heater	\$50
0.70 Water Heater	\$75
Air Purifier	\$20
Dehumidifier	\$25
Room Air Conditioner	\$35
Smart Power Strip	\$10

Conservation Services Group (CSG) serves as the program's primary implementation contractor, playing an oversight role and managing the program. Applied Proactive Technologies (APT) serves as the day-to-day operations contractor and subcontractor to CSG, with its responsibilities including all program fieldwork, along with the following:

- Negotiating memoranda of understanding (MOU's) with retailers and manufacturers;
- 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;

¹ Customers purchasing gas products must be AIC gas customers; customers purchasing electric products must be AIC electric customers.

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

Energy Federation Incorporated (EFI), another subcontractor for the program, manages a Compact Fluorescent Lamp (CFL) catalog and an Internet order fulfillment process, along with reviewing and paying qualified rebates and tracking and paying incentives to manufacturers on CSG's behalf.

Retail stores offering the products largely market the program, using POP signs and rebate applications placed near products offered. APT staff trains retail employees on methods for effectively stocking products and speaking with interested customers.

The "Energy Efficient Products Retailer Manual" (prepared by APT and incorporating input from AIC and CSG) provides training information on the ENERGY STAR program and the products it covers. The manual contains specific "modules," geared towards retail staff and customers. It also contains rebate applications for each product, allowing retailers to become familiar with applications before working with customers.

In PY4, APT trained 15,695 individuals and visited 7,535 locations specifically for the REEP program. During PY4, 365 stores participated in the program. Products at retail stores incorporated POP marketing materials. In most stores, training for REEP occurred concurrently with lighting training.

In addition to the Retailer Manual and in-store advertising, program implementation staff hosts events to advertise program and appliance benefits. Interviews with CSG staff indicated speaking with groups of potential customers offered an effective way to convey efficiency messages as well as ways to provide customers with important program information.

The Cadmus Group, Inc., as part of the evaluation team with Opinion Dynamics Corporation, Navigant Consulting, and Michael's Engineering, performed the PY4 evaluation of the REEP program. This report includes the methodology, analysis, and results of this evaluation.

3. EVALUATION METHODS

3.1 DATA SOURCES AND ANALYTICAL METHODS

The evaluation team's review of the PY4 REEP program sought to address the following research objectives:

- Calculate gross energy and demand savings.
- Identify possible program market effects and progress towards market transformation.
- Assess customer satisfaction and motivations for participating.
- Assess the program NTGR.

Table 4 summarizes research activities informing this evaluation. This chapter describes each major task and data source.

Table 4. Summary of Evaluation Methods

Task	PY4 Impact	PY4 Process	Forward Looking	Details
Program Staff In-Depth Interviews		√		Interview program and implementation staff to gain insights into design and delivery.
Materials Review		√		Review APT progress reports, rebate application forms, program manuals, and POP signs.
Participant Survey	√	√	√	Develop NTG estimates to be used in PY4 and future evaluations.
Database Analysis	√	√		Summarize database information to determine participation and key statistics about the program.

A summary of the methodology employed for each activity follows.

3.1.1 PROCESS ANALYSIS

For the process evaluation, the evaluation team used program database information to analyze product price and purchasing trends by product category. We also reviewed program materials and used information gathered from stakeholder interviews to understand processes and to identify improvement opportunities. The REEP Implementation Model (shown in Appendix C) documents program implementation. Data gathered from the participant survey aided in assessing: how customers heard about the program; how they used smart power strips and programmable thermostats; and their satisfaction with the program. We also analyzed data collected by AIC on the rebate form applications to help understand how customers heard about the program, their motivations for purchasing, and their participation in other programs prior to this one.

Stakeholder Interviews

To assess the program's effectiveness and implementation, the evaluation team conducted interviews with AIC's program manager, CSG's implementation manager, and key representatives from APT and EFI. The evaluation team interviewed stakeholders regarding: program design, implementation and delivery, marketing, implementation barriers, and communications.

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

- Determining program progress;
- Identifying improvement opportunities; and
- Describing how the program operates.

Materials Review

The evaluation team reviewed materials provided by AIC, CSG, and APT, assessing monthly program progress, and reviewing the clarity of marketing materials and program manuals.

Participant Survey

In August and September 2012, the evaluation team conducted 190 telephone surveys with rebate program participants purchasing products offered through REEP during PY4. In addition to informing the impact analysis, as discussed below, the survey gathered information about customer satisfaction and use of the new products.

Rebate Application Survey

AIC includes several survey questions on the rebate form for each product. The evaluation team summarized this information, which includes the following:

- Main reason for the purchase;
- Whether or not the participant saw the rebate label before deciding to purchase;
- Whether the rebate form was helpful in deciding to purchase the product;
- How they heard about the program; and
- Whether they had participated in other AIC programs.

3.1.2 IMPACT ANALYSIS

The evaluation team assessed free ridership and spillover through the 190 telephone surveys of participants. We also used the survey to verify program participation and product installation. We analyzed the customer tracking data to assess gross program impacts, and performed an independent engineering analysis to estimate per-unit gross impacts for future programs.

Database Analysis

CSG tracks retail sales of efficient products using a database, tying payment requests to identified transactions, and tracking the following:

- Program activity by product or product type;
- Program activity, on an aggregated basis of products rebated and dollars spent; and
- Program activity by various identified components (e.g., by product, store chain, manufacturer, and month).

The evaluation team reviewed energy savings assumptions in the database; we then summarized and analyzed the transactions to compute relevant totals for PY4.

Gross Impacts

For the PY4 evaluation, the evaluation team calculated *ex post* gross savings for each measure by multiplying fixed per-unit values from the Illinois Commerce Commission Order for Docket 10-0568, dated December 21, 2010, with the number of rebates and the product verification rate.

The evaluation team calculated the product-specific verification rate using the participant survey, which asked respondents to confirm whether they purchased the product recorded in the database and verified whether the product had been installed.

Net Impacts

The evaluation team calculated PY4 net impacts using self-reported results from the participant surveys. The program was not previously evaluated to obtain an NTGR, and provides a small proportion of portfolio savings. According to commission guidelines, therefore, NTGR is applied retrospectively to PY4. The following formula provided NTGR:

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

Free Ridership

The evaluation team applied a spreadsheet-based matrix approach, assigning a free ridership score to participants, based on the responses to six survey questions. Question response *patterns* were assigned free ridership scores, and confidence and precision estimates were calculated on distributions of these scores.² In addition, our approach included the following important features:

- Derivation of a partial free ridership score, based on the likelihood of a respondent taking similar actions in the incentive's absence.
- Use of a rules-based approach for consistency among multiple respondents.
- Use of consistency checks and open-ended questions to ensure quantitative scores matched respondents' more detailed explanations regarding program attribution.

² The National Action Plan for Energy Efficiency's Model Energy Efficiency Program Impact Evaluation Guide (2007 edition, page 5-1). http://www.epa.gov/cleanenergy/documents/suca/evaluation_guide.pdf

This method offered a key advantage by allowing the partial free ridership concept. Experience showed program participants do not fall neatly into free rider and non-free rider categories. For example, partial free ridership scores were assigned to participants with plans to install the measure. Although the program exerted some influence over these participants' decisions, other market characteristics beyond the program also proved influential. Partial free ridership also allowed use of "don't know" and "refused" responses by classifying them as partial credits, rather than removing the entire set of responses from a particular participant from the analysis. We also compared free ridership to other utility programs and among measures relative to the incentive payment.

Appendix C provides details on the free ridership methodology.

Participant Spillover

The evaluation team also asked participating customers to list additional, energy-efficient items for which they did not receive an incentive from AIC, but had installed in their home since participating in the program. Surveys asked them to rate whether the experience in the REEP program proved very important, somewhat important, not very important, or not at all important in the purchase process. Only measures where program participation was rated as very important³ on subsequent purchases were counted. For each type of measure, 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.

The evaluation team estimated spillover by asking a sample of program participants what additional energy-saving measures they installed that were highly influenced by their participation in the REEP program. We estimated savings for these spillover measures using savings estimates from other AIC programs, if available, and if not, the ENERGY STAR calculator. We then summed all gas and electric spillover measure savings, and compared these to the sum of corresponding gas and electric REEP verified program savings for the sampled participants.

$$\begin{aligned} \text{ElectricSpillover \%} &= \frac{\sum \text{Spillover Measure kWh Savings for All Survey Respondents}}{\sum \text{Spillover Verified Program kWh Savings for All Survey Respondents}} \end{aligned}$$

$$\begin{aligned} \text{Gas Spillover \%} &= \frac{\sum \text{Spillover Measure Therms Savings for All Survey Respondents}}{\sum \text{Spillover Verified Program Therms Savings for All Survey Respondents}} \end{aligned}$$

Corresponding electric and gas spillover was then added to electric and gas NTGR.

Given the evaluation team did not conduct surveys with non-participants, we did not provide an estimate of nonparticipant spillover. Appendix B provides details on the spillover methodology.

3.2 SAMPLING AND SURVEY COMPLETES

³ Customers were asked: "How important was your participation in the Ameren Illinois Efficient Products Program in your decision to install [MEASURE], was it very important, somewhat important, not too important or not at all important?" The report only uses "very important" to compensate for possible "social desirability bias," where respondents indicate they found the program important because they believe this is what researchers want to hear.

3.2.1 TELEPHONE SURVEYS

Table 5 compares program participation levels, survey targets, and completed surveys for the participant survey. The initial sample size drawn equaled approximately five times the desired completes; however, the highest-efficiency (0.70) gas water heaters, heat pump water heaters, and dehumidifiers had participation levels too small to provide sufficiently large samples. Sample targets were contacted five to eight times over a period of two weeks. A large percentage (over 32%) answered the phone, but refused to complete the survey. To analyze survey responses to process evaluation questions, we weighted each product response by the ratio of product population and number of samples. These weights are also included in Table 5.

Table 5. Completed Standard Program Survey Points

Project Type	Database Population	Sample Frame			Process Questions Survey Weights
	Projects	Contacts	Goal	Completed	
Programmable Thermostats	3,730	304	70	48	77.7
0.67 Water Heater	243	151	30	27	9.0
0.70 Water Heater	27	27	*	1	27.0
Heat Pump Water Heater	73	73	30	21	3.5
Room Air Conditioner	5,552	149	30	21	264.4
Air Purifier	907	150	30	30	30.2
Dehumidifier	120	117	30	14	8.6
Smart Power Strip	1,482	153	30	28	52.9
Total	12,117	1,124	280	190	N/A

*Since the population was less than 30, the sample goal was to achieve as many as possible.

Survey Dispositions and Response Rate

The survey response rate is the number of completed interviews divided by the total number of potentially eligible respondents in the sample. We calculated the response rate using standards and formulas set forth by the American Association for Public Opinion Research (AAPOR).⁴ For various reasons, we were unable to determine the eligibility of all sample units through the survey process, and chose to use AAPOR Response Rate 3 (RR3). RR3 includes an estimate of eligibility for these unknown sample units. The formulas used to calculate RR3 are presented below. The definitions of the letters used in the formulas are displayed in the Survey Disposition tables, below.

$$E = (I + R + NC) / (I + R + NC + e)$$

⁴ *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*, AAPOR, 2011. http://www.aapor.org/AM/Template.cfm?Section=Standard_Definitions2&Template=/CM/ContentDisplay.cfm&ContentID=3156

$$RR3 = I / ((I + R + NC) + (E*U))$$

We also calculated a cooperation rate, which is the number of completed interviews divided by the total number of eligible sample units actually contacted. In essence, the cooperation rate gives the percentage of participants who completed an interview out of all participants with whom we actually spoke. We used AAPOR Cooperation Rate 1 (COOP1), which is calculated as:

$$COOP1 = I / (I + R)$$

The approach to calculating response rates differs slightly for Internet-based surveys. In these instances, the survey response rate is the number of completed surveys divided by the total number of potentially eligible respondents in the sample. The quality of the e-mail list is a key factor in determining the eligibility of participants who do not respond to the e-mail, but also do not bounce back. This calculation assumes a high-quality list, in which all respondents are eligible, except those who reply with an accepted reason why they are not eligible (e.g., employee of client).

We fielded the survey with REEP participants from August 21–September 6, 2012. Table 6 shows the final survey dispositions.

Table 6. REEP Survey Dispositions

Disposition	N
Completed Interviews (I)	190
Eligible Non-Interviews	451
<i>Refusals (R)</i>	356
<i>Mid-Interview terminate (R)</i>	26
<i>Respondent never available (NC)</i>	67
<i>Language Problem (NC)</i>	2
Not Eligible (e)	144
<i>Fax/Data Line</i>	9
<i>Non-Working</i>	75
<i>Wrong Number</i>	34
<i>Business/Government</i>	15
<i>Cell Phone</i>	6
<i>No Eligible Respondent</i>	4
<i>Quota Filled</i>	1
Unknown Eligibility Non-Interview (U)	309
<i>No Answer</i>	126
<i>Answering Machine</i>	177
<i>Busy</i>	3
<i>Call Blocking</i>	3
Total Participants in Sample	1,094

The following table provides the response and cooperation rates.

Table 7. REEP Survey Response and Cooperation Rates

AAPOR Rate	Percentage
Response Rate (RR3)	21%
Cooperation Rate	33%

4. RESULTS AND FINDINGS

4.1 PROGRAM INSIGHTS

Overall, the Efficient Products Program has worked as intended. Retailers play an important role in the program, as the majority of customers learned of the offerings through visits to retail establishments. Customers expressed high levels of satisfaction with the available products, rebate process, and overall program.

The primary improvement area customers identified was increased program advertising. The program encouraged customers to replace products still in good condition. Two specific products, the smart power strip and programmable thermostat, were not always being used as intended, as a significant portion of customers indicated they used them similarly to their regular power strips and manual thermostats. The program had an NTGR higher than other utility programs, though this may be partly due to: the product mix, which includes smart power strips, programmable thermostats, and heat pump water heaters with a low free ridership rate (and are not included in many other appliance programs); and from a significant level of program spillover.

The evaluation team offers the following recommendations:

- **Contractors should be included in the program.** AIC should consider expanding its reach to contractors as another advertising channel for the program, particularly regarding water heaters. Established trade ally programs can benefit utilities greatly through harnessing knowledgeable contractors, and leveraging their resources in a way that benefits utilities, customers, and contractors.
- **AIC should focus on explaining benefits from the programmable thermostat and power strip.** Survey results suggest customers express interest in these products, but use them the same way they used their older products, rather than in the intended (and more efficient) manner. Education and outreach efforts already in place for the lighting program can also addressing proper usage of thermostats and power strips.
- **Develop sales tools and effective training.** Interactive displays could also be developed so consumers can see different scenarios regarding configurations of smart power strips with home electronics (i.e., a smart power strip connected to a television, game console, or DVD player; the consumer who has all three will realize the benefits of its application). POP can be useful, but emphasis should be placed on hands-on displays that fully explain benefits to consumers. The smart power strip requires effective training for sales associates to understand how to: (1) introduce the technology and explain how it works; and (2) explain the customer's audiovisual setup, and how the optimal smart power strip can be set up, and convince the customer to purchase and set up units correctly. These education events could be combined with existing lighting clinics.

4.2 PROCESS FINDINGS

4.2.1 MARKETING AND OUTREACH

The REEP program relies heavily on retailers to promote and sell its products via the POS rebates

attached to the products. We analyzed information from AIC's participant rebate form questionnaire to assess how customers learned about the program. As shown in Figure 1, more than one-half of participants learned about the program through retailers. About 10% learned of the program through their utility bills, and another 7% through a friend. Of those learning of the program through retailers, the majority saw either a display (55%) or the rebate form (46%) at the store (see

Figure 2).

Figure 1. Rebate Questionnaire: How Respondents Learned about REEP Program

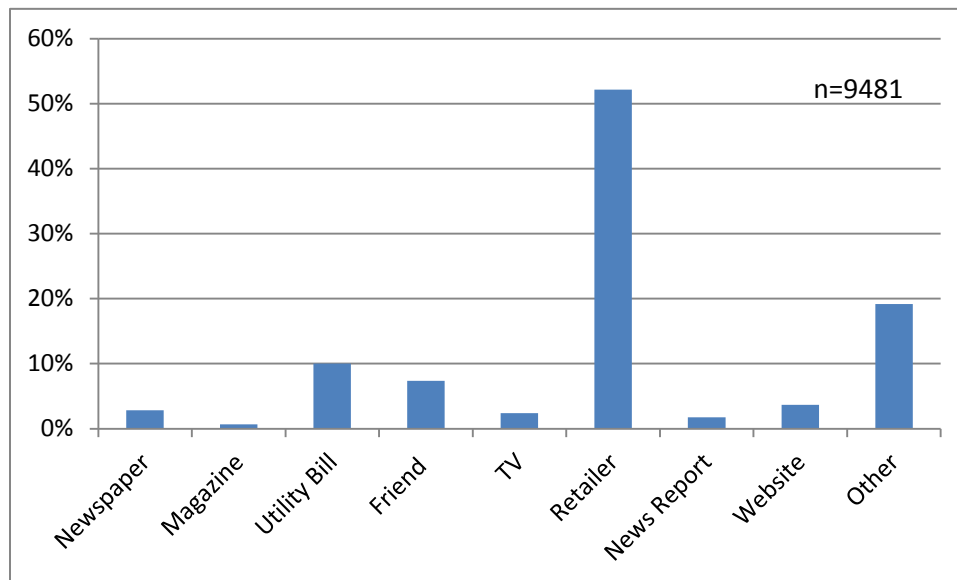
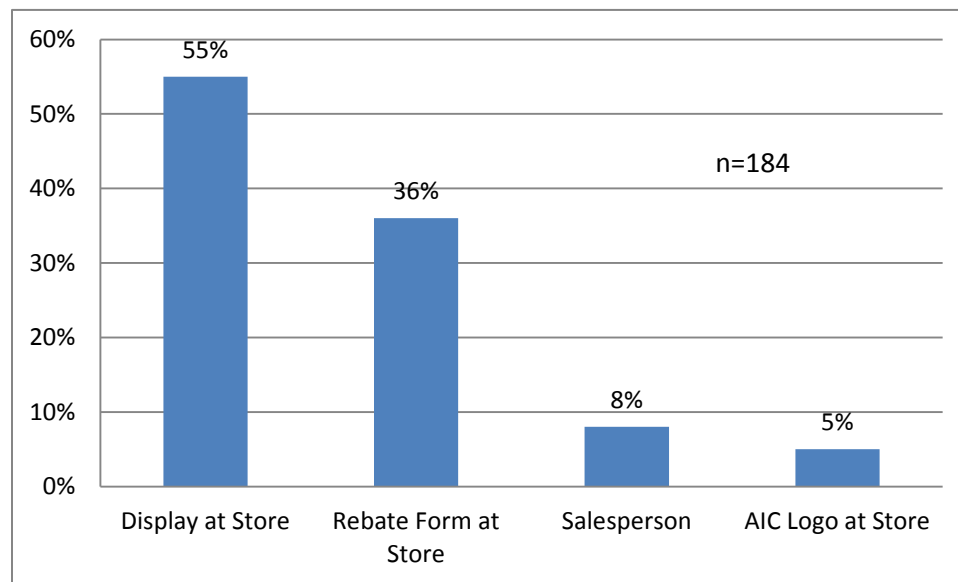


Figure 2. Participant Survey: How Respondents Learned about REEP Program Through Retailers



Stakeholders, who consider retailers to be key program allies, believe marketing the program through retailers has proven to be an effective means of reaching customers. However 40% (23) of survey respondents who suggested improvements to the program asked to see AIC do more advertising outside of stores. Several respondents were surprised they did not know about the program until they walked into a store and saw it advertised there.

During an interview, a program staff member said the reason AIC does not market more generally was that “we don’t want to add load” (i.e., concerns about general advertising that might increase customers’ purchase of products such as air purifiers or dehumidifiers, which may not replace an existing product). Given the rebate level compared to the overall product price, this risk appears small.

Stakeholders also discussed education and outreach they conducted, including in-store information sessions and speaking at special events, such as a local women’s group meeting. One program manager noted that, overall, responses to clinics and other education events have been very positive; in one instance, the response proved particularly encouraging, with attendees volunteering to share their individual efforts to save energy.

4.2.2 PROGRAM SATISFACTION

Survey respondents expressed satisfaction with rebate and product offerings as well as with the program overall. When asked about their satisfaction in these areas, majorities (90%, 76%, and 83%, respectively) were very satisfied.

Respondents also stated their support for the products offered and product availability; 87% of respondents were very satisfied with the product they received, while 76% of respondents were very satisfied with the variety of products offered. When asked about the features they would have liked to have seen on the products, several customers (13 of the 58 who suggested additional features) indicated a preference for a selection of different water heater models as well as for air purifiers with more targeted uses and accessible filters. A member of the program management staff stated they looked for different water heater varieties, and continued to look for products to

add to the list. Figure 3 and Figure 4 show respondents' satisfaction with the incentive and product, respectively.

Figure 3. Satisfaction with the Rebate Amount and Timing

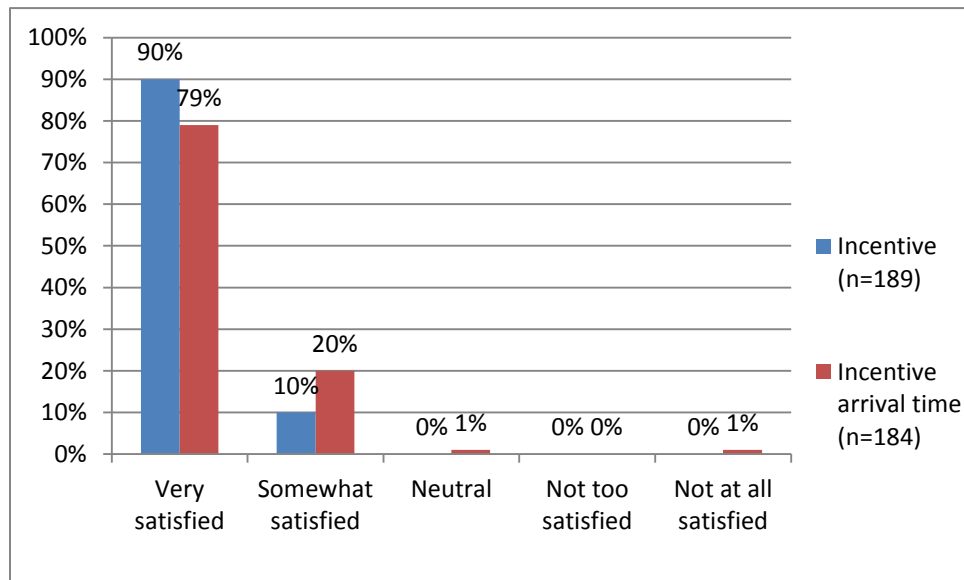
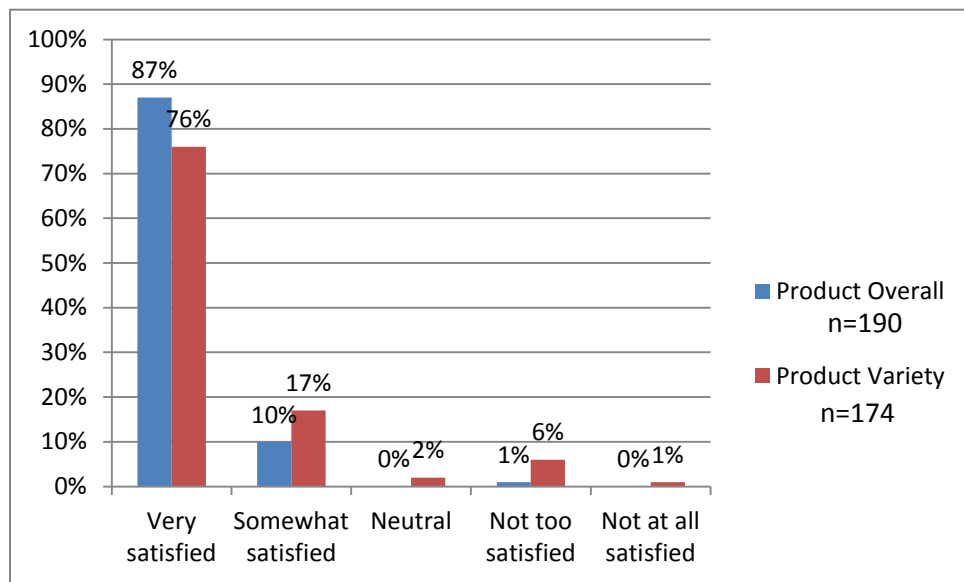
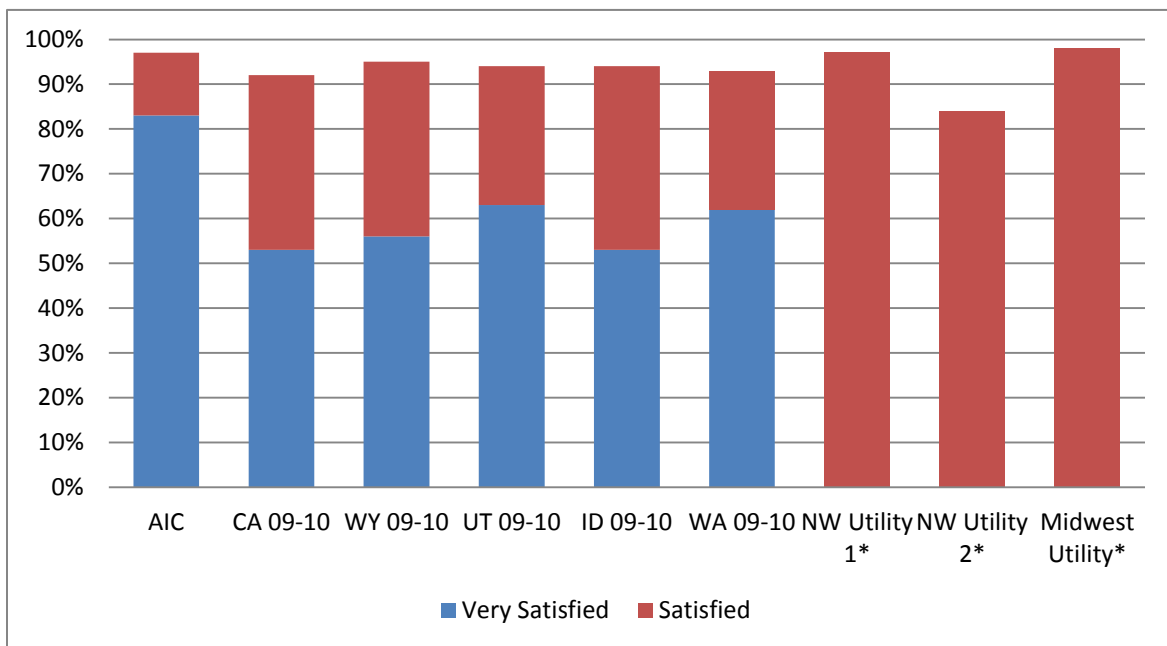


Figure 4. Satisfaction with the Product



To provide some perspective on the satisfaction results, the evaluation team compared satisfaction survey results to those for prescriptive rebate programs at other utilities. Figure 5 shows benchmarking results, comparing AIC's overall program satisfaction to other utility prescriptive rebate programs. While measures and incentives may vary between programs, this figure indicates most utility programs yield similarly high satisfaction rates.

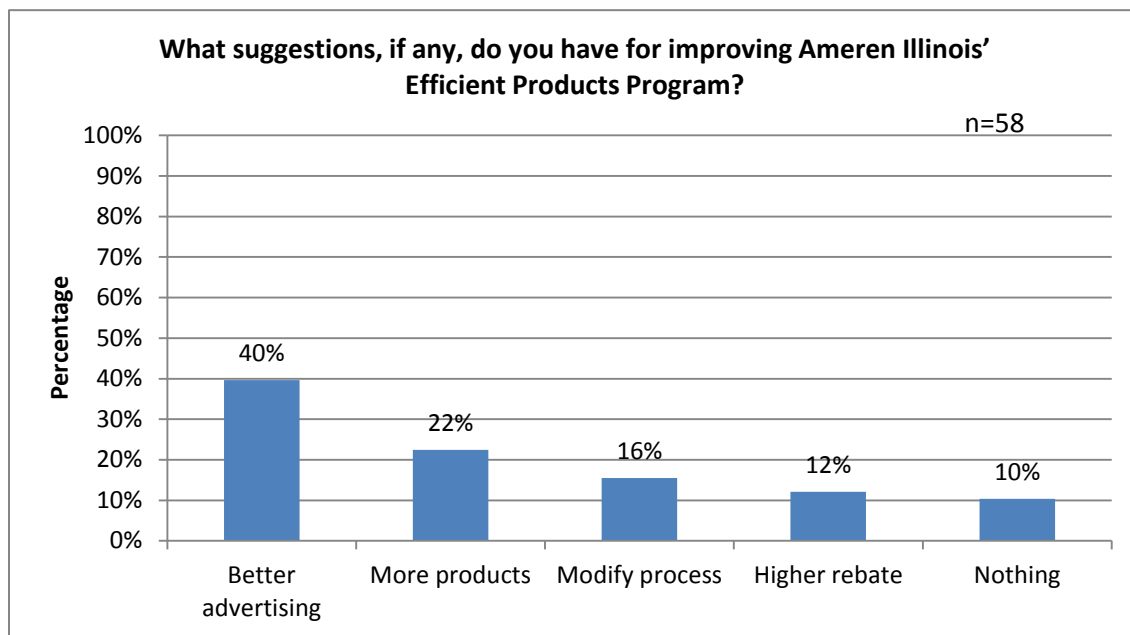
Figure 5. Program Satisfaction Benchmarking



*Very satisfied/satisfied breakdown not available

As shown, the program generally operated smoothly and pleased respondents. While all rebate programs we examined showed high satisfaction rates, AIC's satisfaction results were consistently among the highest. This satisfaction is also reflected in the small number of negative responses. For instance, when asked about their overall satisfaction, only four of 188 respondents (3%) expressed dissatisfaction. Three offered reasons, including: a lack of knowledge about the program; the product not working; and incorrect information provided by the retailer. Twenty-two percent of respondents indicated they would have liked to see a greater rebate for products offered. Figure 6 categorizes the suggestions respondents offered to the open-ended question about how the program could be improved. Note that rebate programs nationwide commonly receive requests for increased rebate amounts.

Figure 6. Suggestions for Program Improvement

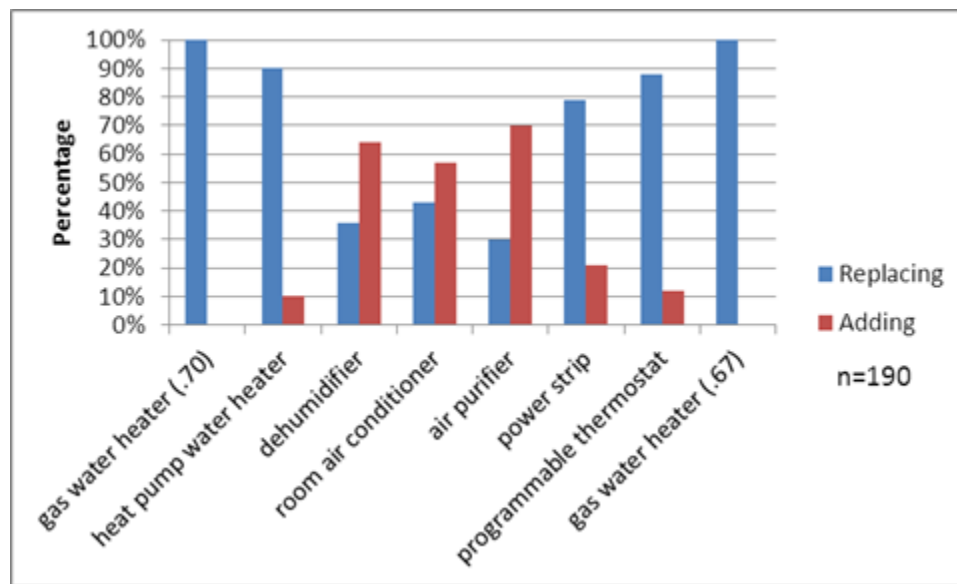


4.2.3 PURCHASE MOTIVATION

To understand purchasing motivations, we looked at whether customers replaced existing products or purchased a new product with the rebate. We also asked directly about how much the rebate influenced the product purchase.

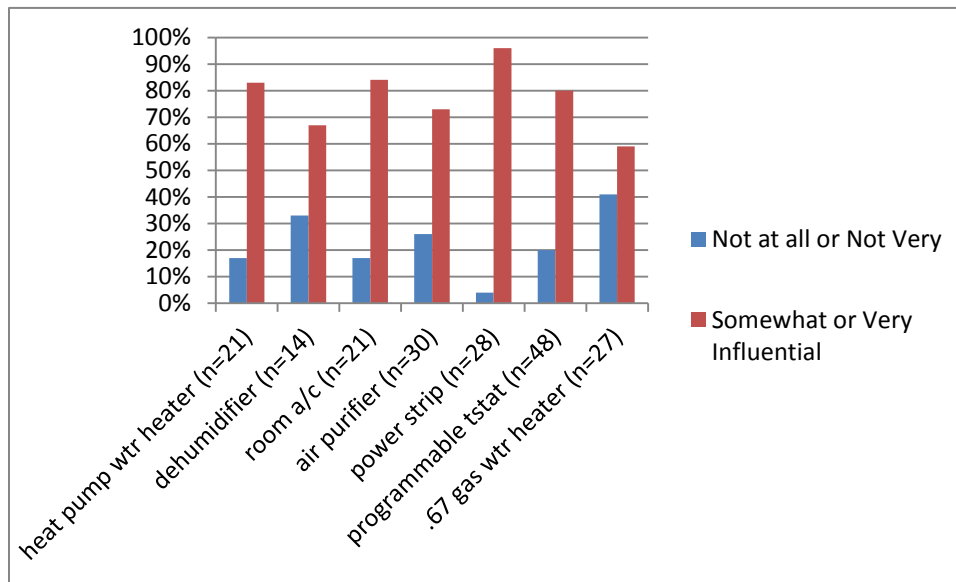
The majority of respondents stated they replaced working products with the program-rebated products, and revealed many of the products they replaced were in good condition (71% of respondents replaced their products; 51% stated the product replaced remained in good condition). Figure 7 lists responses by individual products sold.

Figure 7. Product Replacement vs. Additional



Dehumidifiers, room air conditioners, and air purifiers, participants were more likely to have not previously owned a similar product. The air purifier, which was added to the efficient product lineup in PY4, proved very successful, exceeding its planned installation goals. Room air conditioners also sold well, but these were removed after savings were reduced, per the Illinois statewide TRM (and therefore will not be offered in PY5).

In examining the rebate's role in customer purchase decisions, the participant survey and AIC's rebate form survey revealed some notable findings. Only 17% of rebate survey respondents knew about the rebate prior to entering the store, but the rebate proved influential in their purchasing decisions. Figure 8 shows influence levels rebates had on respondents' decisions to purchase efficient products.

Figure 8. Participant Survey Rebate Influence on Purchase

In examining other approaches to understand the rebate's influence, AIC's rebate form questionnaire asked: whether the customer noticed the rebate label *before* purchasing the item; and "what was the main reason you decided to purchase the product?" Figure 9 shows over 60% did see the label before purchasing; the highest rates occurred with heat pump water heaters, at close to 80%, and the lowest with gas water heaters, at only 11%. Table 8 shows the majority of customers (57%) said "Energy Savings"; the next highest reason given was the rebate (20%). Heat pump water heater purchases had the highest percentage of responses indicating "Energy Savings" (over 80%). Smart power strip purchasers had the highest percentage of responses indicating "Rebate" at 27%.

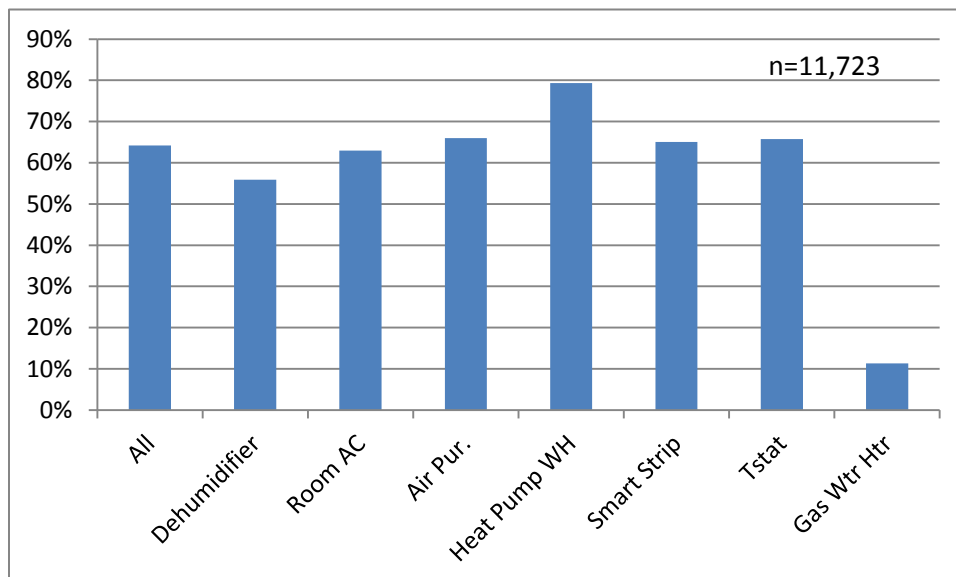
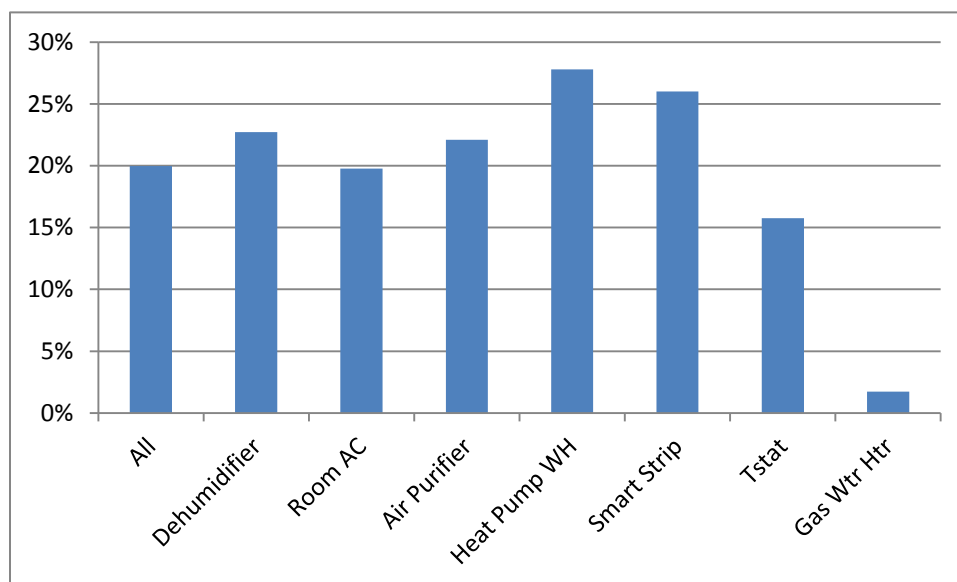
Figure 9. Noticed Label Before Purchase Decision

Table 8. Main Reason for Product Purchase

Product	Energy Savings	Rebate	Quieter	Buy the Best	Surge Protection	Other
All	57%	20%	3%	6%	5%	9%
Dehumidifier	56%	19%	5%	10%	0%	10%
Room AC	58%	20%	4%	7%	0%	11%
Air Purifier	40%	21%	10%	15%	0%	14%
Heat Pump Water Heater	81%	16%	0%	3%	0%	0%
Smart Power Strip	24%	11%	0%	2%	61%	2%
Programmable Thermostat	71%	21%	0%	2%	0%	7%
Gas Water Heater	71%	12%	0%	7%	0%	10%

Program Influence on Participation in Other AIC Programs

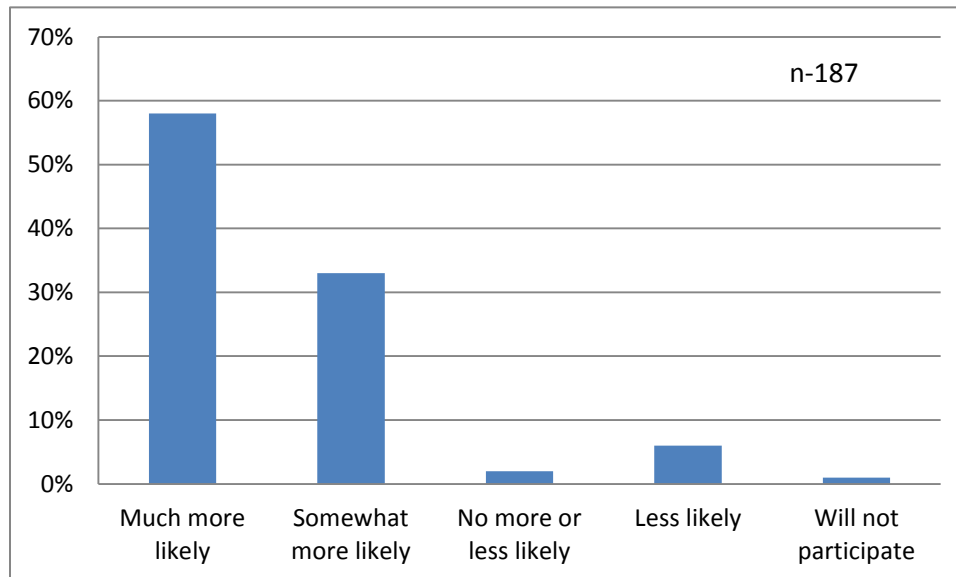
AIC asked rebate participants (on the rebate form) whether they had participated in other AIC programs prior to this purchase, and 20% answered affirmatively. Figure 10 shows these participation levels in other programs (prior to REEP participation) for each product and for all products. Heat pump water heater purchasers had the highest percentage of customers with previous program experience (28%), while gas water heaters had the least (2%).

Figure 10. Other Program Participation By Product

The evaluation team asked participant survey respondents if they had participated in other AIC programs *after* their participation in REEP, and 19% (36 respondents) said they had.

We also asked participants if they would be more likely to participate in other AIC programs in the future. Figure 11 shows 91% of respondents stated they would be more likely to participate in another program, based on their experiences with REEP.

Figure 11. Likelihood of Further AIC Program Participation



Product Specific Insights

Customer reactions to three specific products—smart power strips, programmable thermostats, and water heaters—indicated areas where AIC could improve its program. We discuss this as well as concerns about dehumidifiers and air purifiers below.

Smart Power Strips. The majority of customers purchasing power strips replaced old ones (see Figure 7). However, when asked about how they used the power strip, 15 respondents (53%) indicated they did not use the product in a manner to save energy, using the product the same way as they had used the old one. Thirteen (or 46%) reported using it to conserve energy, either by shutting down all attached accessories when one was turned off, or by turning all accessories off at night or on a specific schedule.

APT has worked with power strip manufacturers, such as TrickleStar, to better inform retailers for the PY5 cycle. TrickleStar representatives will speak about their product at events, and the company will work with independent retailers to distribute its products. Such efforts should publicize the power strip's energy-efficient capabilities and its associated savings, and be continued and expanded.

Programmable Thermostats. Programmable thermostats were the items most commonly purchased in the survey sample. The majority of customers purchasing the item did so to replace units with a single temperature setting (82%, or 39 of 47 respondents). Of 47 respondents purchasing a thermostat, however, just over half (52%) used the product as intended, with the remainder indicating they adjusted the thermostat manually (11%) or left it at the same temperature all the time (37%).

The usability of programmable thermostats remains a studied issue, and AIC customers performed better than in a 2001 study where Meier (et al.) found: "[T]he majority of occupants operated

thermostats manually...and almost 90% of respondents reported that they rarely or never adjusted the thermostat to set a weekend or weekday program.”⁵ This study also found 26% of subjects in one test could not turn their thermostats from the “off” option to the “heat option.”⁶ While this study is over 10 years old, it confirms our participant survey, which indicated customers find correctly using programmable thermostats challenging. Results and supporting evidence from the study suggested AIC’s education efforts remain important for achieving effective use of the product.

Gas Water Heaters. In all instances (28 total), gas water heaters were considered replacements; heat pump water heaters were replaced 90% of the time. Only two of 21 respondents installing heat pump water heaters also added units to their HVAC system. In selecting a new water heater, the customer made the decision 96% of the time; contractors recommended a product in only 2 of 49 instances.

Eighty percent of respondents stated they installed the product themselves. Since this is a role traditionally filled by contractors, it appears that AIC reached the “do-it-yourself” niche of customers with this rebate. In PY4, 27 individuals installed the 0.70 gas water heater, 243 installed the 0.67 water heater, and 73 installed the heat pump water heater. Program staff indicated this participation was lower than their goals. Engaging contractors with the program could increase participation.

Dehumidifiers and Air Purifiers. For two products—dehumidifiers and air purifiers—more program participants added units than replaced them in PY4. Although program staff were concerned that promoting these products could increase load, if the rebate caused people to purchase a unit they otherwise would not have, we believe this risk is small. The incentive is approximately 15% of the product cost, and likely will not induce a customer to purchase a product not already planned. As most program advertising is near the product at the store, a customer would not find out about it unless they were already shopping. Mass marketing, in addition to POS, might encourage customers considering replacement of an existing dehumidifier to do so sooner, due to ongoing cost savings.

4.3 IMPACT RESULTS

4.3.1 PARTICIPANT VERIFICATION/INSTALLATION RATE

The participant telephone survey verified all of the customers surveyed did, indeed, purchase the subject product, although a small percentage did not have the product installed at the time of the survey. Further, for programmable thermostats and smart power strips, we asked whether the product was being used in a manner to result in energy savings. Resulting verification rates were: 93% for dehumidifiers; 53% for programmable thermostats; 46% for smart power strips; and 100% for the remaining products. To calculate the verification rate for programmable thermostats, we reviewed responses to the following participant survey questions:

1. Did your new programmable thermostat replace a manual thermostat?

⁵ Meier, Alan, et al. 2001. “Usability of residential thermostats: Preliminary investigations.” *Building and Environment* 46, 1891-1898.

⁶ Ibid.

2. Did you regularly adjust/program your previous thermostat to save energy when you were gone or at night?
3. Do you program this new thermostat for regular temperatures setting changes, do you manually adjust it, or do you leave it at the same setting always?
4. Do you program this new thermostat for approximately the same temperature settings and time periods as your previous thermostat or differently?
5. Please describe how you set your previous thermostat.
6. Please describe how you program this new thermostat.

We identified the scenarios described in Table 9 as indicative of product use to save energy. These respondents totaled 21 out of 47 responding to the questions, or 47%. As the fixed per-unit savings used to estimate savings already assumed only 86% used the thermostat to save energy, we divided the 47% by 86%, and then multiplied by the 98% installation rate to compute an estimated verification rate of 53%.

Table 9. Programmable Thermostat Analysis

Scenario	Q1	Q2	Q3	Q4	Q5 & Q6	Number of Respondents
#1	Yes	XX	Program	xx	xx	19
#2	No	Yes	Program	Different	(Q6 has more setback periods than q5)	2
#3	No	No	Program	xx	xx	0

Table 10. REEP Verification and Installation Rate

Project Type	Database Population	Sample				Verification Rate ^a
	Projects	Completed Surveys	Product Purchased	Product Installed	Product Used for Energy Savings	
Programmable Thermostats	3,730	48	48	47	21	53%
0.67 Water Heater	243	27	27	27	27	100%
0.70 Water Heater	27	1	1	1	1	100%
Heat Pump Water Heater	73	21	21	21	21	100%
Room Air Conditioner	5,555	21	21	21	21	100%
Air Purifier	907	30	30	30	30	100%
Dehumidifier	120	14	14	13	13	93%
Smart Power Strip	1,482	28	28	28	13	46%
Total	12,136	190	190	188	147	63%

^a Computed by dividing verified installed, and used for energy savings products by completed surveys.

4.3.2 GROSS IMPACTS

Total gross energy and demand savings, based on program participation, were 1,560 MWh, 236 kW, and 115,584 therms. We multiplied per-unit fixed savings values from ICC Order for Docket 10-0568, by verified participation to estimate gross savings. Table 11 shows the gross savings results.

Table 11. PY4 Program Gross Impacts

Measure	Participation	Verified Participation	Per Unit Impact ^c			Gross Impacts		
			kWh	kW	Therm	MWh	kW	Therm
Programmable Thermostat								
Gas Heat	3,074	1,629	0	0	67	0	0	109,158
Electric Heat	656	348	776	0	0	270	0	0
Electric AC	1,863	987	194	0.10	0	192	98	0
Subtotal	3,730	1,977	776	0	67	461	98	109,158
Heat Pump Water Heater	73	73	1,802	0.0854 ^A	0	132	6	0
.67 Water Heater	243	243	0	0	23	0	0	5,589
.70 Water Heater	27	27	0	0	31	0	0	837
Air Purifier	907	907	268	0.0306	0	243	28	0
Dehumidifier	120	112	229	0.0523	0	26	6	0
Room AC	5,554	5,554	104	0.0329 ^D	0	578	183	0
Smart Power Strip	1,482	682	177	0.0199	0	121	14	0
Total	12,136	9,575	NA			1,560	236	115,584

^A Assumes 2,533 full load hours.^B 948 full load hours.^C Per Unit Impacts were taken from the ICC Order for Docket 10-0568.

4.3.3 NET IMPACTS

Table 12 and Table 13 show REEP free ridership and spillover results. We estimated free ridership for each measure using responses from the participant survey, and then weighted by verified program product savings to estimate the total. We estimated spillover by summing estimated savings for each spillover measure reported by survey participants, and then divided by the sum of all REEP verified program savings for the surveyed participants. For reporting purposes and prospective use, we grouped measures into two sets of electric measures and one set of gas measures, balancing NTGR precision and allowing variety among measures.

Table 12. REEP Free Ridership Results

	Responses (n)	FR Score at 90% confidence
Room AC / Dehumidifier / Air Purifier	65	0.31 ($\pm$ 0.07)
Thermostat—Elec Heat / Thermostat—AC / Power Strips / H.P. Water Heater	97	0.23($\pm$ 0.04)
Gas Measures	28	0.32 ($\pm$ 0.08)
Total	190	0.30 ($\pm$ 0.04)

Table 13. REEP Program NTG

	Responses (n)	FR	S0	NTGR
Room AC / Dehumidifier / Air Purifier	65	.31	0.09	0.78
Thermostat—Elec Heat / Thermostat—AC / Power Strips / H.P. 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 14 shows free ridership, along with absolute and relative precisions for each individual measure.⁷ Due to small individual measure sample sizes, the precision around these estimates is quite high. However, results show power strips experience considerably lower free ridership than other measures. This likely results from the product's relatively unknown status among consumers.

⁷ Absolute precision means the actual FR score is plus or minus that amount, where relative precision means the FR score is plus or minus that percentage of the score.

Table 14. Free Ridership Scores by Product

Product	N	FR Score	Absolute Precision (90% confidence)	Relative Precision (90% confidence)	Contribution to Total Gross MWh Savings	Contribution to Total Gross Therms Savings
Heat Pump Water Heater	21	0.25	0.132	53%	8%	0%
Gas Water Heater - \$50	27	0.54	0.113	21%	0%	5%
Gas Water Heater - \$75	1	0.25	n/a	n/a	0%	1%
Room AC	21	0.34	0.128	38%	37%	0%
Dehumidifier	14	0.45	0.165	36%	2%	0%
Air Purifier	30	0.30	0.099	34%	16%	0%
Programmable Tstat - Elec Heat	23	0.26	0.118	45%	17%	0%
Programmable Tstat-Gas Heat/Elec AC	25	0.29	0.107	37%	12%	94%
Power Strip	28	0.10	0.051	49%	8%	0%

Table 15 shows spillover measures identified by survey participants, along with the quantity in which the program was very important in influencing the decision to purchase. Per unit savings, along with the total for both electric and gas measures and spillover percentages are shown for each measure.

Table 15. Spillover Measures

Product	High Importance Quantity	Elec Savings (kWh) per unit	Gas Savings (therms) per unit	Total Elec Savings (kWh)	Total Gas Savings	% Electric Spillover ^a	% Gas Spillover ^a
CFL	127	0	n/a	0	0	0.0%	0.0%
LED Bulb	42	46	n/a	1,932	0	2.9%	0.0%
ES Refrigerator	5	141	n/a	705	0	1.1%	0.0%
ES Freezer	1	49	n/a	49	0	0.1%	0.0%
ES Clothes Washer	7	434	n/a	3,038	0	4.6%	0.0%
ES Dishwasher	4	0	n/a	0	0	0.0%	0.0%
ES Room AC	2	104	n/a	208	0	0.3%	0.0%
Programmable thermostat	1	0	67	0	67	0.0%	2.3%
ENERGY STAR Furnace	1	0	146	0	146	0.0%	9.5%
Installed insulation (sqft)	1,600	0	0	0	144	0.0%	9.4%
Total Spillover	n/a	n/a	n/a	5932	357	9%	21%

^a Spillover percent calculated as sample spillover divided by sample program savings.

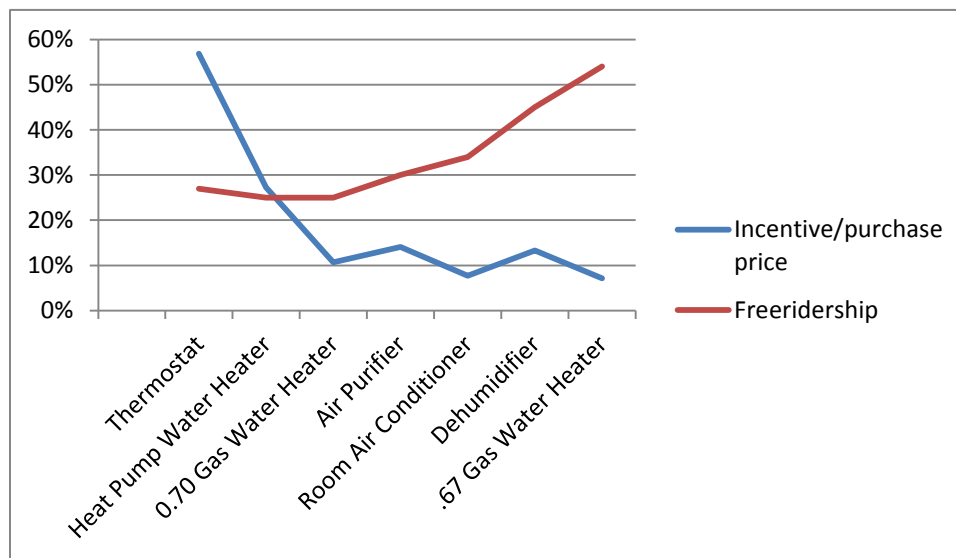
The evaluation team benchmarked AIC's NTG results against other similar programs across the country. AIC's PY4 Efficient Products Program's 30% free ridership estimate runs lower than similar utility programs, and has one of the highest spillover rates, at 14%. This may result from the unique combination of products AIC offers, as smart power strips purchasers reported lower free ridership rates (which may be due to it being a newer technology). Table 16 compares AIC results to those from other recent program evaluations. While measures and incentives may vary between programs, this provides a perspective on NTGRs seen in other prescriptive rebate programs.

Table 16. Residential Efficient Products NTGR Program Benchmarking

Utility	Survey respondents (n)	FR	Part SO	NTG
AIC – PY4	190	30%	14%	84%
Northwest Utility 1 – 2010	67	48.0%	0.0%	52.0%
Northwest Utility 1 – 2011	94	61.8%	3.6%	41.9%
Northwest Utility 2 – 2011	217	43.4%	0.0%	56.6%
Northwest Utility 2 – 2011	217	33.0%	0.0%	67.0%
California Utility – 2011	154	42.9%	0.0%	57.1%
Southwest Utility – 2011	223	40.4%	0.0%	59.6%
Midwest Utility – 2011	293	45.9%	13.7%	67.8%
Northeast Utility 2010	76	56.6%	2.8%	46.2%

We also compared free ridership to the ratio of incentive and average product purchase prices. In Figure 12, we plot incentives as a share of the purchase price against free ridership to illustrate the inverse correlation between the two (the calculated correlation coefficient is -0.6). The only exception to this is smart power strips, a newer technology, with many customers still unaware of its benefits (and not included in the figure). This information could be used to inform AIC's future program planning to determine appropriate incentives levels that will maximize participation, minimize free ridership, and balance program budgets. For example, should AIC wish to decrease the budget by lowering incentives, they should understand free ridership would increase, resulting in lowered net savings. The data are shown in

Table 17. Appendix D provides more detailed information on pricing and purchasing trends.

Figure 12. Incentives As A Share of Purchase Price vs. Free Ridership**Table 17. Incentives and Free Ridership by Measure**

Category	Average Price	Average Rebate	% of Purchase Price	Free Ridership
Thermostat	\$44	\$25	57%	27%
Heat Pump Water Heater	\$1,101	\$300	27%	25%
0.70 Gas Water Heater	\$702	\$75	11%	25% ^a
Air Purifier	\$142	\$20	14%	30%
Room Air Conditioner	\$259	\$20	8%	34%
Dehumidifier	\$188	\$25	16%	45%
.67 Gas Water Heater	\$698	\$50	7%	54%
Smart Power Strip	\$43	\$10	23%	10%

^a Value reflects only one survey response.

Table 18 shows *ex ante* and *ex post* net impacts and factors, such as NTG, required for their calculation. The evaluation team calculated *ex ante* net impacts by multiplying the *ex ante* NTG ratio with the *ex ante* gross impacts, and calculated *ex post* net impacts by multiplying *ex ante* gross impacts with the verification rate and *ex post* NTG ratio. Resulting total, *ex post* net impacts are: 1,275 MWh, 270 kW, and 104,440 therms.

Table 18. PY4 Ex Ante And Ex Post Net Program Impacts

Measure	Savings Type	Ex Ante Gross Savings	Ex Ante NTGR	Ex Ante Net Savings	Verification Rate	Verified Gross Savings	NTGR	Ex Post Net Savings	Net Realization Rate
Programmable Thermostat AC and Gas Heat	Therms	205,958	0.87	179,183	53%	109,158	0.90	98,634	55%
	MWh	361	0.87	314	53%	192	0.86	165	52%
	kW	184	0.87	160	53%	98	0.86	84	52%
Programmable Thermostat Electric Heat	MWh	509	0.87	443	53%	270	0.86	232	52%
	kW	0	0.87	0	53%	-	0.86	-	N/A
Heat Pump Water Heater	MWh	132	0.76	100	100%	132	0.86	113	113%
	kW	6	0.76	5	100%	6	0.86	5	113%
0.67 Water Heater	Therms	5,589	0.58	3,242	100%	5,589	0.90	5,050	156%
0.70 Water Heater	Therms	837	0.58	485	100%	837	0.90	756	156%
Air Purifier	MWh	519	0.76	394	100%	243	0.78	190	103%
	kW	326	0.76	247	100%	28	0.78	22	103%
Dehumidifier	MWh	28	0.76	21	93%	26	0.78	20	96%
	kW	6	0.76	5	93%	6	0.78	5	96%
Room Air Conditioner	MWh	578	0.76	439	100%	578	0.78	451	103%
	kW	183	0.76	139	100%	183	0.78	143	103%
Smart Power Strip	MWh	262	0.76	199	46%	121	0.86	104	52%
	kW	29	0.76	22	46%	14	0.86	12	52%
Total Program ^c	Therms	212,384	0.86	182,911		115,584	0.90	104,440	57%
	MWh	2,113	0.81	1701		1560	0.82	1275	75%
	kW	437	0.81	352		334	0.81	270	77%

- ^a *Ex ante* results are calculated using the same fixed unit values as *ex post* results, without adjustment for verified purchase or installation rates.
- ^b *Ex post* results are calculated using verified purchase and installation rates and new NTG estimates.
- ^c Total program results may not exactly match the sum of the program results due to rounding

A. APPENDIX: DATA COLLECTION INSTRUMENTS

Appliance Participant Survey

Ameren Illinois

Efficient Product Program Participating Residential Survey 2012

Introduction

Hello, my name is _____ and I am calling from _____ on behalf of Ameren Illinois. We are calling today because we would like your opinions about your recent experience with the Ameren Illinois Efficient Products Program. This is not a sales call. Would you have a few minutes to answer some questions now?

[If needed: This will take about 15 minutes.]

[If needed: Contact at Ameren Illinois to confirm survey legitimacy – [Sharon Ruhland, 309-677-5192](#)]

A1. We'd like to talk with the person who made the decision to buy products receiving rebates from Ameren Illinois. Would that be you?

1. Yes
2. No **[ASK TO SPEAK WITH PERSON WHO WAS PRIMARY DECISION MAKER. IF NOT AVAILABLE, THANK AND SET CALLBACK]**
- D. DON'T KNOW **[THANK AND TERMINATE]**
- R. Refused **[THANK AND TERMINATE]**

A2. In the last year, our records show that you received a rebate **[for each product insert each rebate amount]** for **[insert count of each product]**. Is that correct? **[Mark all confirmed]**

1. Room Air Conditioner (Number ____)
2. Air Purifier (Number ____)
3. Dehumidifier (Number ____)
4. Power Strip (Number ____)
5. Heat Pump Water Heater (Number ____)
6. Programmable Thermostat (Number ____)
7. Gas Water Heater (Number ____)
8. DON'T KNOW
9. REFUSED

A3. **[IF ANY OF READ PRODUCTS READ FROM A1=NO, DK, REFUSED]** Please tell me which products you purchased and received a rebate. [MULTIPLE RESPONSE: INCLUDE COUNTS OF ALL THAT APPLY]

1. Number of Room Air Conditioners ____
2. Number of Air Purifiers ____
3. Number of Dehumidifiers ____
4. Number of Power Strips ____
5. Number of Heat Pump Water Heaters ____
6. Number of Programmable Thermostats ____
7. Number of Gas Water Heaters ____
8. (Don't know) [TERMINATE]
9. (Refused) [TERMINATE]

A4. [IF A3=7] Did you receive a \$50 or \$75 rebate for your purchase of the gas water heater?

1. (\$50)
2. (\$75)
8. (Don't know)
- 9 (Refused)

[CALCULATE VERIFIED MEASURES]

Program Awareness

B1. How did you first hear about Ameren Illinois' rebates for efficient appliances? **[DO NOT READ; DO NOT PROMPT - ONE ANSWER ONLY]**

1. Saw rebate form at the store
2. Saw sign/display at the store
3. Salesperson or other store staff told me about it
4. Saw store advertising with Ameren logo
5. Ameren Website **[SKIP TO B3]**
6. Other Website **[SPECIFY]**
7. Personal Energy Report (PER)
8. E-mail from Ameren Illinois
9. Bill insert/information came in the mail with my bill
10. Friend, family member, co-worker (word of mouth)
00. Other **[SPECIFY]**
98. DON'T KNOW
99. REFUSED

[ASK IF B1 ≠ 5]

B2. Have you been to the Ameren Illinois Website?

1. Yes
2. No
8. DON'T KNOW
9. REFUSED

[CALCULATE PRODUCT1 AND PRODUCT2 AS WELL AS INCENTIVE1 AND INCENTIVE2 FROM VERIFIED CALCULATION ABOVE]

B3. **[IF MORE THAN ONE PRODUCT, REPEAT QUESTION FOR TWO PRODUCTS THAT ARE FURTHEST FROM REACHING QUOTA]** Please think back to the time when you were deciding to buy a new **[PRODUCT]**. What motivated you to purchase a new **[PRODUCT]**? **[DO NOT READ LIST; INDICATE ALL THAT APPLY]**

1. Old equipment didn't work
2. Old equipment working poorly
3. The incentive or rebate
4. The information or technical assistance I got from Ameren Illinois
5. Wanted to save energy
6. Wanted to reduce energy costs
7. Past experience with this program
8. Because of past experience with another Ameren program
9. Recommendation of dealer/retailer
10. Recommendation from friend/family
11. Saw advertisement for rebate program
12. Environmental concerns
13. Global warming
14. Keeping up with the latest technology or trends
15. **[IF PRODUCT=POWER STRIP]** Needed plug strip

00. Other [SPECIFY]
98. DON'T KNOW
99. REFUSED

Usage/Retention

[IF A2 or A3 = MORE THAN 1 RESPONSE, REPEAT EACH QUESTION FOR SAME TWO PRODUCTS AS ABOVE]

C1. Is the **[PRODUCT]** for which you received a rebate installed in your home now? **[RECORD ONE ANSWER ONLY]**

1. Yes, it is currently installed in my home
2. No, it is installed at some other location **[Record where it was installed: _____]**
Ask: Is this a business? _____]
 - 3. It was installed in my home but is now permanently removed (broke, burned out, don't fit, don't like, etc.)
 - 4. It was installed at home, wasn't working properly, and was replaced with another energy efficient **[PRODUCT]** through warranty
 - 5. It was sold or given away
 - **6. [IF AC UNIT]** It was installed and used over the summer but is currently in storage

00. Other [SPECIFY]

8. DON'T KNOW

9. Refused

[ASK C1AA AND C1AAA IF C1=2]

C1AA. Where is the <PRODUCT> installed? [OPEN END]

C1AAA. Is this a business? [yes, no, dk, refused]

C2. [IF PRODUCT= POWERSTRIP AND C1=1, or 4] What type of equipment do you have attached to the power strip?

1. Entertainment (TV, Home Theater)
2. Workspace (computer, home office)
3. Other [specify] _____
4. Not currently using
8. DON'T KNOW
9. REFUSED.

C3. [IF PRODUCT= POWERSTRIP] How do you use your new power strip? [PROBE TO DETERMINE WHICH RESPONSE IS MOST ACCURATE OR READ IF NECESSARY]

1. To shut off all attached equipment at night
2. To shut off all attached equipment when one item is turned off
3. To shut off all attached equipment on a specific schedule
 - i. What is the schedule? _____
4. Just use it like a regular power strip.
5. Other [specify] _____
6. Not currently using
- D DON'T KNOW

9. Refused.

C4. [IF PRODUCT= WATER HEATER (product code 1, 2, 8)] Did you choose the water heater you purchased or did a contractor recommend the specific model you bought?

1. (Customer chose)
2. (Contractor recommendation)
3. (Other [specify] _____)
8. DON'T KNOW
9. REFUSED

C5. [IF PRODUCT= WATER HEATER (product code 1, 2, 8)] Who installed the new water heater in your home, was it....?

1. You or a friend or family member, or
2. A Contractor
3. Other [Specify] _____
8. DON'T KNOW
9. REFUSED

C6. [IF PRODUCT=THERMOSTAT] Did your new programmable thermostat replace a manual thermostat? **[IF NECESSARY, “a manual thermostat has only one setting for the internal temperature you want and must be manually adjusted]”**

- 7. Yes
- 8. No
- 8.DON'T KNOW **[SKIP TO D1]**
- 9.REFUSED **[SKIP TO D1]**

C7. [IF PRODUCT=THERMOSTAT] Did you regularly **[IF C6=1 “adjust” IF C6=2 “program”]** your previous thermostat to save energy when you were gone or at night?

- 1. Yes
- 2. No
- 8.DON'T KNOW
- 9.REFUSED

C8. [IF PRODUCT=THERMOSTAT] Do you program this new thermostat for regular temperatures setting changes, do you manually adjust it, or do you leave it at the same setting always? (PROBE TO FIND THE RESPONSE MOST ACCURATE, CHOOSE ONLY ONE)

- 1. (Program)
- 2. (Manually adjust) **[SKIP TO C12]**
- 3. (Leave at same setting) **[SKIP TO C12]**
- 8.DON'T KNOW **[SKIP TO C13]**
- 9.Refused **[SKIP TO C13]**

C9. [IF PRODUCT=THERMOSTAT, C7=a and C8=a] Do you program this new thermostat for approximately the same temperature settings and time periods as your previous thermostat or differently?

- 1. Same
- 2. Differently
- 8. DON'T KNOW **[SKIP TO C11]**
- 9. Refused **[SKIP TO C11]**

C10. **[IF PRODUCT=THERMOSTAT AND C9=a or b]**. Please describe how you set your previous thermostat. **[PROBE TO DETERMINE WHICH RESPONSE BELOW IS MOST ACCURATE OR READ IF DON'T KNOW]**

1. (Adjusted for night and daytime work hours both summer and winter
2. (Adjust for night only both summer and winter
3. (Adjust for night and daytime, winter only
4. (Adjust for night and daytime, summer only
5. (Adjust for night only, winter only
6. (Adjust for night only, summer only
7. (Adjust for vacations only
8. (Set at one temperature for summer and one temperature for winter
00. Other [Specify]

8.DON'T KNOW **[READ LIST ABOVE TO DETERMINE WHICH IS CLOSEST AND ATTEMPT TO CATEGORIZE]**

9.Refused

C11. **[IF PRODUCT=THERMOSTAT AND C9=2,8,9]**. Please describe how you program this new thermostat. **[PROBE TO DETERMINE WHICH RESPONSE BELOW IS MOST ACCURATE OR READ IF DON'T KNOW]**

1. Programmed to adjusted during night and daytime work hours both summer and winter
2. Adjust for night only both summer and winter
3. Adjust for night and daytime work hours, winter only
4. Adjust for night and daytime work hours, summer only
5. Adjust for night only, winter only
6. Adjust for night only, summer only
7. Adjust for vacations only
8. Set at one temperature for summer and one temperature for winter
00. Other **[Specify]** _____

98.DON'T KNOW **[READ LIST ABOVE TO DETERMINE WHICH IS CLOSEST AND ATTEMPT TO CATEGORIZE]**

99.Refused

C12. **[IF PRODUCT=THERMOSTAT]** Approximately how long have you been operating your thermostat this way? Would it be...

1. Less than 3 months
2. 3 to less than 6 months
3. 6 months to less than 9 months
4. 9 months to a year
5. More than a year
- 8.DON'T KNOW
- 9.REFUSED

C13. **[IF PRODUCT=THERMOSTAT]** What temperature is this new thermostat typically set for at night in the winter, would it be...

1. Less than 62
2. 63 to 66 ° F
3. 66-69°F
4. 70-74°F
5. 75-79°F
6. 80°F or higher
- D. DON'T KNOW
- 9.REFUSED

C13. **[IF PRODUCT=THERMOSTAT]** What temperature is this new thermostat typically set for at mid-afternoon in the summer, would it be...

1. Less than 62
2. 63 to 66 ° F
3. 66-69°F
4. 70-74°F
5. 75-79°F
6. 80°F or higher
- 8.DON'T KNOW
- 9.REFUSED

C14. **[IF PRODUCT=THERMOSTAT]**. Approximately what percentage of your home is controlled with this thermostat? Would it be...

1. Less than 10%
2. 11-20%
3. 21-30%
4. 31-40%
5. 41-50%
6. 51-60%
7. 61-70%
8. 71-80%
9. 81-90%
10. More than 90%
- 98.DON'T KNOW
- 99.REFUSED

Satisfaction

[[IF A2 or A3 = MORE THAN ONE RESPONSE, REPEAT QUESTIONS D1, D2, D3, D4, D6, D7 FOR EACH PRODUCT]

D1. How satisfied are you with the new **[PRODUCT]**, would you say you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied?

1. Very satisfied
2. Somewhat satisfied
3. Neutral **[DO NOT READ]**
4. Not too satisfied
5. Not at all satisfied
8. DON'T KNOW
9. REFUSED

D2. How satisfied were you with the **[INSERT REBATE AMOUNT]** incentive you received for the new **[PRODUCT]**, would you say you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied?

1. Very satisfied
2. Somewhat satisfied
3. Neutral **[DO NOT READ]**
4. Not too satisfied
5. Not at all satisfied
8. DON'T KNOW
9. REFUSED

D3. How satisfied were you with how quickly you received your incentive payment for **[PRODUCT]**? Would you say you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied?

1. Very satisfied
2. Somewhat satisfied
3. Neutral **[DO NOT READ]**
4. Not too satisfied
5. Not at all satisfied
8. DON'T KNOW
9. REFUSED

D4. How clear were the program's requirements and process? Would you say:

1. Very Clear **[SKIP TO D6]**
2. Somewhat Clear **[SKIP TO D6]**
3. NEUTRAL **[DO NOT READ] [SKIP TO D6]**
4. Somewhat Unclear
5. Very Unclear
8. DON'T KNOW **[SKIP TO D6]**
9. REFUSED **[SKIP TO D6]**

[SKIP IF D4=1,2,3,8,9]

D5. Why did you say that the program's requirements and process were **[INSERT ANSWER FROM D4]**

1. [Record Response] _____
8. DON'T KNOW
9. REFUSED

D6. How satisfied were you with the variety of **[INSERT PRODUCT]** eligible for rebate? **[IF NECESSARY, FOR INSTANCE, DID THE PRODUCT YOU PURCHASED HAVE ALL THE FEATURES YOU WERE LOOKING FOR?]**

1. Very Satisfied **[SKIP TO D8]**
2. Somewhat Satisfied
3. Neutral
4. Not Too satisfied
5. Not at all Satisfied
8. DON'T KNOW **[Skip to D8]**
9. REFUSED **[SKIP TO D8]**

D7. What features would you have liked to see offered?

1. [Record Response] _____

D8. How satisfied are you with the Efficient Products program overall?

1. Very satisfied **[SKIP TO D10]**
2. Somewhat satisfied **[SKIP TO D10]**
3. NEUTRAL **[SKIP TO D10]**

4. Not too satisfied
5. Not at all satisfied
8. DON'T KNOW [SKIP TO D10]
9. REFUSED [SKIP TO D10]

[SKIP IF D8=1,2,3,8,9]

D9. What about the Program were you dissatisfied with? [DO NOT READ MARK ALL THAT APPLY]

1. Incentive was too small
2. Hard to find products
3. Products were too expensive
4. Products didn't have features I wanted
5. I couldn't purchase the product through my contractor
6. Program requirements were too onerous
7. Other [Specify]
8. DON'T KNOW
9. REFUSED

D10. What suggestions, if any, do you have for improving Ameren Illinois' Efficient Products Program?

1. [Specify] _____
2. None
8. DON'T KNOW
9. REFUSED

D11. [IF PRODUCT= POWERSTRIP] How would you suggest that Ameren Illinois encourage other customers to purchase and use energy efficient power strips?

SPECIFY: _____

8. DON'T KNOW
9. Refused

Prior Equipment

[IF A2 or A3 = MORE THAN ONE RESPONSE, REPEAT EACH QUESTION FOR EACH PRODUCT]

E1. [IF MORE THAN ONE PRODUCT, REPEAT QUESTION FOR SAME 2 PRODUCTS AS ABOVE] Did the new [PRODUCT] replace an old unit, or were you adding an additional [PRODUCT] to your home?

1. Replacing
2. Adding

- 8. DON'T KNOW
- 9. REFUSED

E2. [ASK IF E1 = 1] About how old was the [PRODUCT] you replaced? [READ CATEGORIES IF NEEDED]

- 1. Less than 5 years old
- 2. 5 to 9 years old
- 3. 10 to 19 years old
- 4. 20 to 29 years old
- 5. 30 or more years old
- 8. DON'T KNOW
- 9. REFUSED

E3. [IF B3 ≠ 1 or 2 then ASK] Was the old [PRODUCT] in good, fair, or poor working condition?

- 1. Good
- 2. Fair
- 3. Poor
- 4. Not working
- 8. DON'T KNOW
- 9. REFUSED

E4. [E1= 1] What did you do with the old [PRODUCT]?

- 1. Sold or gave away
- 2. Installed in another location
- 3. Still in home but permanently removed (stored in garage, etc.)
- 4. Recycled
- 5. Threw away or took to dump
- 6. Contractor or retailer took it away
- 8. DON'T KNOW
- 9. REFUSED

Freeridership

[IF A1 or A3 = MORE THAN ONE RESPONSE, REPEAT EACH QUESTION FOR SAME 2 PRODUCTS AS ABOVE]

F1. Did you first learn about the Ameren Illinois rebate before you began shopping for your new [PRODUCT], while you were shopping but before making your decision, or after you decided to purchase the new [PRODUCT].

- 1. Before shopping
- 2. While shopping but before making the decision
- 3. After deciding to purchase
- 8. DON'T KNOW
- 9. REFUSED

F2. [IF F1=3] Just to confirm, before you first learned about the Ameren Illinois rebate, had you already purchased or decided to purchase this specific make and model of the [PRODUCT]?

1. Yes [SKIP TO G1
2. No
8. DON'T KNOW
9. REFUSED

F3. Before you knew about the rebate, were you already planning to purchase a new [PRODUCT]?

1. Yes
2. No [SKIP TO F5]
8. DON'T KNOW [SKIP TO F5]
9. REFUSED [SKIP TO F5]

F4. Before entering the store, had you selected the exact make and model of [PRODUCT] you purchased, or did you determine the make and model after you arrived at the store?

1. Yes, same make and model already selected
2. No, determined once I arrived
8. DON'T KNOW
9. REFUSED

F5. If the rebate of [dollar amount for PRODUCT] had not been available, would you still have purchased the exact same make and model of [PRODUCT]?

1. Yes
2. No
8. DON'T KNOW
9. REFUSED

F6. [ASK if F5= 2] Without the rebate of [INSERT REBATE AMOUNT FOR PRODUCT], would you have purchased a [PRODUCT] with the same level of energy efficiency, or would it have been more efficient, or less efficient?

1. More efficient
2. Less efficient
3. Same level of efficiency
4. Would not have bought [PRODUCT]
8. REFUSED
9. DON'T KNOW

F7. Did the rebate offer cause you to purchase the [PRODUCT] sooner than you would have otherwise?

1. Yes
2. No [SKIP TO F9]
- D. DON'T KNOW [SKIP TO F9]
- R. REFUSED [SKIP TO F9]

F8. [ASK IF F7= 1] Without the rebate, when would you have purchased the **[PRODUCT]**? **[READ LIST]**

1. Later in the same year
2. In 1 or 2 years
3. In 3 to 5 years
4. After more than 5 years
5. Not at all
- D. DON'T KNOW
- R. REFUSED

F9. How influential was the rebate in your decision to purchase this specific make and model of the **[PRODUCT]**? Would you say it was:

1. Not at all influential
2. Not very influential
3. Neutral **[DO NOT READ]**
4. Somewhat influential
5. Very influential
8. DON'T KNOW
9. REFUSED

Spillover

G1. Have you participated in any other energy-efficiency programs offered by Ameren Illinois?

1. Yes
2. No **[GO TO G5]**
- D. DON'T KNOW **[Go to G5]**
- R. REFUSED **[Go to G5]**

G2. Which programs did you participate in?

1. Home Energy Performance (audit program)
2. Lighting Program
3. Heating and Cooling Incentives
4. Home Energy Reports
5. Appliance Recycling
6. Other **[Specify]**
- D. DON'T KNOW **[GO TO G5]**
- R. REFUSED **[GO TO G5]**

G3. [ASK FOR EACH PROGRAM IN G2] Did you participate in **[INSERT PROGRAM FROM G2]** after or before this Efficient Products Program?

1. After
2. Before **[SKIP TO G5]**
- D. DON'T KNOW **[SKIP TO G5]**

R. Refused **[SKIP TO G5]**

G4. How influential was your experience participating in the Efficient Products program on your decision to participate in another Ameren Illinois energy-efficiency program? Would you say it was:

1. Very Influential
2. Somewhat Influential
3. Neutral **[DO NOT READ]**
4. Not too Influential
5. Not at all Influential
- 99. Don't know
- 100. Refused

G5. Based on your experience with the Efficient Products Program, how likely are you to participate in another utility energy efficiency program? Would you say you are... **[READ LIST]**

1. Much more likely
2. Somewhat more likely
3. Neutral **[DO NOT READ]**
3. No more or less likely
4. Less likely to participate in another program

5. (DO NOT READ: will not participate)

-98. DON'T KNOW

-99. REFUSED

G6. Now I'd like to ask you about any energy saving actions you may have taken on your own without an incentive or rebate from Ameren Illinois. Since you received the rebates we've been talking about, have you purchased any other products or made any other changes to reduce energy use in your home for which you did not receive an Ameren Illinois incentive or rebate?

1. Yes
2. No **[SKIP TO H1]**
8. DON'T KNOW **[SKIP TO H1]**
9. REFUSED **[SKIP TO H1]**

G7. **[IF G6 = 1]** Please describe these energy efficient activities or purchases you made. **[DO NOT READ, MARK ALL THAT APPLY]**

1. Performed a home audit
 2. Recycled a refrigerator
 3. Recycled a freezer
 4. Purchased CFLs? **[ASK: How many?]** _____
 5. Purchased LED light bulbs? **[ASK: How many?]** _____
 6. Purchased Light fixtures or ceiling fan **[ASK: How many?]** _____
 7. Purchased ENERGY STAR refrigerator
 8. Purchased ENERGY STAR freezer
 9. Purchase ENERGY STAR clothes washer
 10. Purchased ENERGY STAR dishwasher
 11. Purchased ENERGY STAR room air conditioner **[ASK: How many?]** _____
 12. Purchased ENERGY STAR electronics (e.g. TV, DVD, computer)
 13. Purchased ENERGY STAR dehumidifier
 14. Purchased ENERGY STAR water heater
 15. Installed a low flow showerhead or faucet aerator **[ASK: How many?]** _____
 16. Purchased and programmed a programmable thermostat
 17. Installed insulation
 - a. **[ASK: How many sqft]**
 - b. **[ASK: Location (Attic, Wall, Floor, Ceiling)]**
 18. Installed solar panels
 - a. **[ASK: How many]**
 - b. **[ASK: Size of system installed]**
 19. Other **[SPECIFY VERBATIM]** _____
- 8.DON'T KNOW
9.REFUSED

G8. A. [READ IF G7=1] How important was your participation in the Ameren Illinois Efficient Products Program in your decision to have a home audit? Would you say it was:

1. Very Important
 2. Somewhat Important
 3. Not to Important
 4. Not at all Important
- 8.DON'T KNOW
9.REFUSED

G8. B. [READ IF G7=2 or 3] How important was your participation in the Ameren Illinois Efficient Products Program in your decision to recycle your refrigerator or freezer? Would you say it was:

1. Very Important
2. Somewhat Important
3. Not too Important

- 4. Not at all important
- 8.DON'T KNOW
- 9.REFUSED

G8. C [READ IF G7=4 through 19] How important was your participation in the Ameren Illinois Efficient Products Program in your decision to purchase **[INSERT PRODUCT FROM G7]**? Would you say it was:

- 1. Very Important
- 2. Somewhat Important
- 3. Neutral **[DO NOT READ]**
- 4. Not too Important
- 5. Not at all important
- 8.DON'T KNOW
- 9.REFUSED

G8. D [READ IF G7=16] Did the programmable thermostat replace a manual thermostat?

- 9. Yes
- 10. No **[SKIP TO H1]**
- 8.DON'T KNOW **[SKIP TO H1]**
- 9.REFUSED **[SKIP TO H1]**

G9 [READ IF G7=16 and G8.D=1] Did you regularly adjust your previous thermostat when you were gone or at night?

- 1. Yes
- 2. No
- 8.DON'T KNOW
- 9.REFUSED

G10 [READ IF G7=16, G8.D=1] How do you use your new programmable thermostat, would you say you...

- a. Have it programmed to adjust when you aren't home or at night
- b. Manually adjust it when you are not home or at night
- c. Leave it set on one setting
- d. Or something else? **[SPECIFY]** _____
- 8.DON'T KNOW
- 9.Refused

Demographics

"Now I have just a few final questions about your home and energy awareness."

H1. How informed do you feel you are about ways to save energy, including buying and using energy efficient appliances and equipment? Would you say:

1. Very Informed
2. Somewhat Informed
3. Neither informed nor uninformed
4. Somewhat Uninformed
5. Very Uninformed
- 98. Don't know
- 99. Refused

H2. Which one of the following best describes the type of home in which you live? (READ)

1. A single-family detached **[no common walls]**
2. A single-family attached **[at least one common wall with the surrounding swellings, such as a town home, patio home, or condo]**
3. Multi-family home, such as an apartment **[requires a different family living above or below, such as an apartment]**
4. A mobile home or trailer
5. Other **[SPECIFY]** _____
- 98. Don't know
- 99. Refused

H3. About how large is your home in square feet, excluding your garage and patio?

1. Under 1,000 square feet
2. 1,001 – 1,500 square feet
3. 1,501 – 2,000 square feet
4. 2,001 – 2,500 square feet
5. 2,501 – 3,000 square feet
6. More than 3,000 square feet **[SPECIFY]** _____ square feet
- 98. Don't know
- 99. Refused

H4. What is the approximate age of your home?

- _____ **[record years]**
- 98. Don't know
 - 99. Refused

H5. Is your home...

1. All electric
2. Gas and electric
3. Some other combination of energy sources.....
- 98. Don't know
- 99. Refused

H6. How many people live in your home year round, including yourself?

- 1. 1
- 2. 2
- 3. 3
- 4. 4
- 5. 5
- 6. 6
- 7. 7+
- 98. Don't know
- 99. Refused

H7. In 2011, which of the following categories best describes your total annual household income before taxes? **[READ LIST] PLEASE STOP ME WHEN I READ YOUR CATEGORY**

- 1. Less than \$15,000
- 2. \$15,000 to less than \$25,000
- 3. \$25,000 to less than \$35,000
- 4. \$35,000 to less than \$50,000
- 5. \$50,000 to less than \$75,000
- 6. \$75,000 to less than \$100,000
- 7. \$100,000 to less than \$150,000
- 8. \$150,000 or more
- 98. Don't know
- 99. Refused

H8. What is your average Ameren Illinois Utilities bill in the summer?

_____ Dollars

Don't know

Refused

H9. What is your average Ameren Illinois Utilities bill in the winter?

_____ Dollars

Don't know

Refused

H10. Which of the following best describes your age?

- 1. Less than 18 years old
- 2. 18-24 years old
- 3. 25-34 years old
- 4. 35-44 years old
- 5. 45-54 years old

- 6. 55-64 years old
- 7. 65 or older
- 98. Don't know
- 99. Refused

H11. RECORD GENDER OF RESPONDENT **[DO NOT ASK]**

- 1. Male
- 2. Female
- 98. Don't know

[THANK & TERMINATE]

B. APPENDIX: NTG ALGORITHM

Free Ridership Survey Questions

Six questions were asked in the residential efficient products survey's free ridership portion. In the list below, a general description of each question precedes the full text of the question appearing in the survey. We use the general description in tables throughout the rest of this report when referring to the residential free ridership questions.

1. **Already Purchased.** Did you first learn about the Ameren Illinois rebate before you began shopping for your new [PRODUCT], while you were shopping but before making your decision, or after you decided to purchase the new [PRODUCT].
2. **Planning to Purchase.** Before you knew about the rebate, were you already planning to purchase a new [PRODUCT]?
3. **Same Make/Model.** If the rebate of [dollar amount for PRODUCT] had not been available, would you still have purchased the exact same make and model of [PRODUCT]?
4. **Same Efficiency.** Without the rebate of [INSERT REBATE AMOUNT FOR PRODUCT], would you have purchased a [PRODUCT] with the same level of energy efficiency, or would it have been more efficient, or less efficient?
5. **Same Time.** Did the rebate offer cause you to purchase the [PRODUCT] sooner than you would have otherwise?
6. **Rebate Influence.** How influential was the rebate in your decision to purchase this specific make and model of the [PRODUCT]?

Table 19, below, shows the unique response combinations from the residential efficient products participant survey, the free ridership score assigned to each combination, and the number of responses for each combination.

Table 19. Frequency of Free Ridership Scoring Combinations—Residential Efficient Products

Response Combination	Already purchased	Planning to purchase	Same make / model	Same efficiency	Same time	Rebate Influential	Free Ridership Score	Response Frequency
1	Yes	.	.	.	.	.	100%	16
2	No	Yes	Don't Know	Yes	No	Not at all influential	100%	1
3	No	Yes	Yes, same make and model already selected	Yes	No	Not at all influential	100%	2
4	No	Yes	Yes, same make and model already selected	Yes	No	Not very influential	100%	2

Response Combination	Already purchased	Planning to purchase	Same make / model	Same efficiency	Same time	Rebate Influential	Free Ridership Score	Response Frequency
5	Don't Know	Don't Know	.	Yes	No	Not very influential	75%	1
6	No	Yes	No, determined once I arrived	Yes	No	Not at all influential	75%	19
7	No	Yes	No, determined once I arrived	Yes	No	Not very influential	75%	5
8	No	No	.	Yes	No	Not at all influential	50%	1
9	No	No	.	Yes	No	Not very influential	50%	1
10	No	Yes	Don't Know	Yes	No	Somewhat influential	50%	1
11	No	Yes	Yes, same make and model already selected	Don't Know	No	Not at all influential	50%	1
12	No	Yes	Yes, same make and model already selected	Yes	No	Somewhat influential	50%	5
13	No	Yes	Yes, same make and model already selected	Yes	No	Very influential	50%	2
14	No	Yes	Yes, same make and model already selected	Yes	Yes	Not very influential	50%	1
15	No	Don't Know	.	Yes	No	Somewhat influential	25%	1
16	No	No	.	Don't Know	No	Not at all influential	25%	1
17	No	Yes	Don't Know	Yes	Don't Know	Very influential	25%	1
18	No	Yes	No, determined once I arrived	Yes	No	Somewhat influential	25%	24
19	No	Yes	No, determined once I arrived	Yes	No	Very influential	25%	8
20	No	Yes	Yes, same make and model already selected	Yes	Don't Know	Somewhat influential	25%	3
21	No	Yes	Yes, same make and model already selected	Yes	Don't Know	Very influential	25%	2

Response Combination	Already purchased	Planning to purchase	Same make / model	Same efficiency	Same time	Rebate Influential	Free Ridership Score	Response Frequency
22	No	No	.	Yes	No	Somewhat influential	13%	5
23	No	No	.	Yes	No	Very influential	13%	1
24	No	Yes	No, determined once I arrived	Yes	Don't Know	Somewhat influential	13%	6
25	No	Yes	No, determined once I arrived	Yes	Don't Know	Very influential	13%	10
26	No	Yes	Yes, same make and model already selected	Yes	Yes	Somewhat influential	13%	2
27	No	Yes	Yes, same make and model already selected	Yes	Yes	Very influential	13%	1
28	Don't Know	No	.	Don't Know	Don't Know	Somewhat influential	0%	1
29	Don't Know	Yes	No, determined once I arrived	Yes	Yes	Somewhat influential	0%	1
30	No	Don't Know	.	No	Don't Know	Very influential	0%	1
31	No	Don't Know	.	Yes	Yes	Very influential	0%	1
32	No	No	.	Don't Know	Don't Know	Somewhat influential	0%	1
33	No	No	.	Don't Know	Don't Know	Very influential	0%	3
34	No	No	.	Don't Know	No	Somewhat influential	0%	1
35	No	No	.	Don't Know	No	Very influential	0%	1
36	No	No	.	Don't Know	Yes	Very influential	0%	2
37	No	No	.	No	Don't Know	Very influential	0%	2
38	No	No	.	No	No	Somewhat influential	0%	1
39	No	No	.	No	No	Very influential	0%	3
40	No	No	.	No	Yes	Very influential	0%	5

Response Combination	Already purchased	Planning to purchase	Same make / model	Same efficiency	Same time	Rebate Influential	Free Ridership Score	Response Frequency
41	No	No	.	Yes	Don't Know	Somewhat influential	0%	2
42	No	No	.	Yes	Don't Know	Very influential	0%	1
43	No	No	.	Yes	Yes	Somewhat influential	0%	1
44	No	No	.	Yes	Yes	Very influential	0%	2
45	No	Yes	No, determined once I arrived	Don't Know	Don't Know	Somewhat influential	0%	2
46	No	Yes	No, determined once I arrived	Don't Know	Don't Know	Very influential	0%	5
47	No	Yes	No, determined once I arrived	Don't Know	No	Somewhat influential	0%	7
48	No	Yes	No, determined once I arrived	Don't Know	No	Very influential	0%	6
49	No	Yes	No, determined once I arrived	No	Don't Know	Not very influential	0%	1
50	No	Yes	No, determined once I arrived	No	Don't Know	Very influential	0%	1
51	No	Yes	No, determined once I arrived	No	No	Not at all influential	0%	1
52	No	Yes	No, determined once I arrived	No	No	Very influential	0%	4
53	No	Yes	No, determined once I arrived	No	Yes	Somewhat influential	0%	1
54	No	Yes	No, determined once I arrived	No	Yes	Very influential	0%	4
55	No	Yes	No, determined once I arrived	Yes	Yes	Somewhat influential	0%	2
56	No	Yes	No, determined once I arrived	Yes	Yes	Very influential	0%	2
57	No	Yes	Yes, same make and model already selected	No	No	Somewhat influential	0%	1
58	No	Yes	Yes, same make and model already selected	No	No	Very influential	0%	1

Only 16 respondents (8.4% of total) had already purchased the measure before hearing about an AC rebate; these were all asked a confirmation question to ensure they answered correctly; and are being scored as 100% free riders. Another four respondents indicated that, while they learned about the rebate before they purchased, they would have bought the same model at the same time and the rebate had very little influence on their decision. Other respondents indicated varying

degrees of free ridership through different combinations of responses to the six questions.

Figure 13 shows a distribution of the efficient products survey respondents by the free ridership score assigned to each. Only 11.1% of residential efficient products survey respondents were 100% free riders. Another 13.2% were 75% free riders. Moderate levels of free ridership (12.5% to 50%) were observed for .6% of respondents, while 35.3% had a score of zero.

Figure 13. Distribution of Residential Appliance Free Ridership Scores



Spillover Survey Questions

As noted, the spillover questions sought to determine whether program participants had installed any other energy-saving measures since participating in the program. Savings that participants received from additional measures would be considered spillover savings only if they rated their participation in the REEP program as “Very Important” in their decision to purchase additional measures, and only if they did not receive rebates or incentives for those measures.

We specifically asked survey respondents whether they had installed the following types of measures:

- Energy-efficient appliances
- Efficient HVAC equipment
- Windows or insulation
- CFLS or LEDs
- Recycled a refrigerator or freezer
- Low flow showerheads or faucet aerators
- Performed a home audit
- Purchased and programmed a programmable thermostat

- Installed insulation
- Installed solar panels
- Other items as specified

Table 20 shows the spillover measures identified by survey participants meeting the criteria of not already receiving an incentive and responding that their participation in the program was “very important” in the decision to purchase. The table reports unit savings estimates, total savings, and percentage spillover. Although we already screened out customers who indicated they received incentive from AIC for the installed measure, the evaluation team decided that CFLs were likely to have been discounted through the program (since the program is widespread and customers may not be aware of the discount when they purchase). To be conservative, we did not include CFL spillover in the total. We also did not count spillover for ENERGY STAR dishwashers, since almost all dishwashers made currently receive ENERGY STAR designation.

Table 20. Spillover Measures

Product	High Importance Quantity	Elec Savings (kWh) per unit	Gas Savings (therms) per unit	Total Elec Savings (kWh)	Total Gas Savings	% Electric Spillover	% Gas Spillover
CFL	127	0	n/a	0	0	0.0%	0.0%
LED Bulb	42	46	n/a	1932	0	2.9%	0.0%
ES Refrigerator	5	141	n/a	705	0	1.1%	0.0%
ES Freezer	1	49	n/a	49	0	0.1%	0.0%
ES Clothes Washer	7	434	n/a	3038	0	4.6%	0.0%
ES Dishwasher	4	0	n/a	0	0	0.0%	0.0%
ES Room AC	2	104	n/a	208	0	0.3%	0.0%
Programmable thermostat	1	0	67	0	36	0.0%	2.3%
ENERGY STAR Furnace	1	0	146	0	146	0.0%	9.5%
Installed insulation (sqft)	1,600	0	0	0	144	0.0%	9.4%
Total Spillover	n/a	n/a	n/a	5932	357	9%	21%

C. APPENDIX: REEP IMPLEMENTATION MODEL

The evaluation team created an implementation model for the Residential Efficient Products Program (REEP) that was evaluated in PY4. An implementation model is a graphic presentation of the intervention—what occurs and who undertakes the functional activities of the program.

The model, created in a multi-level Visio format, displays various functions in rows, with the key stakeholders and processes in the columns. We determined these functions, stakeholders, and processes by reviewing the available program documentation, which we further refined in interviews with program staff. This model does not attempt to assess the effects of the program.

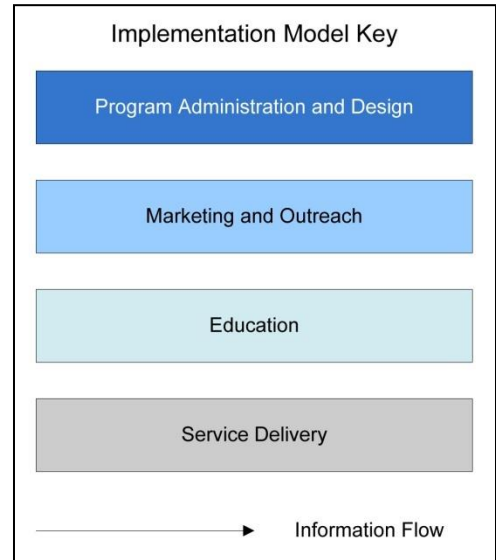
The model is organized by function and the stakeholders involved.

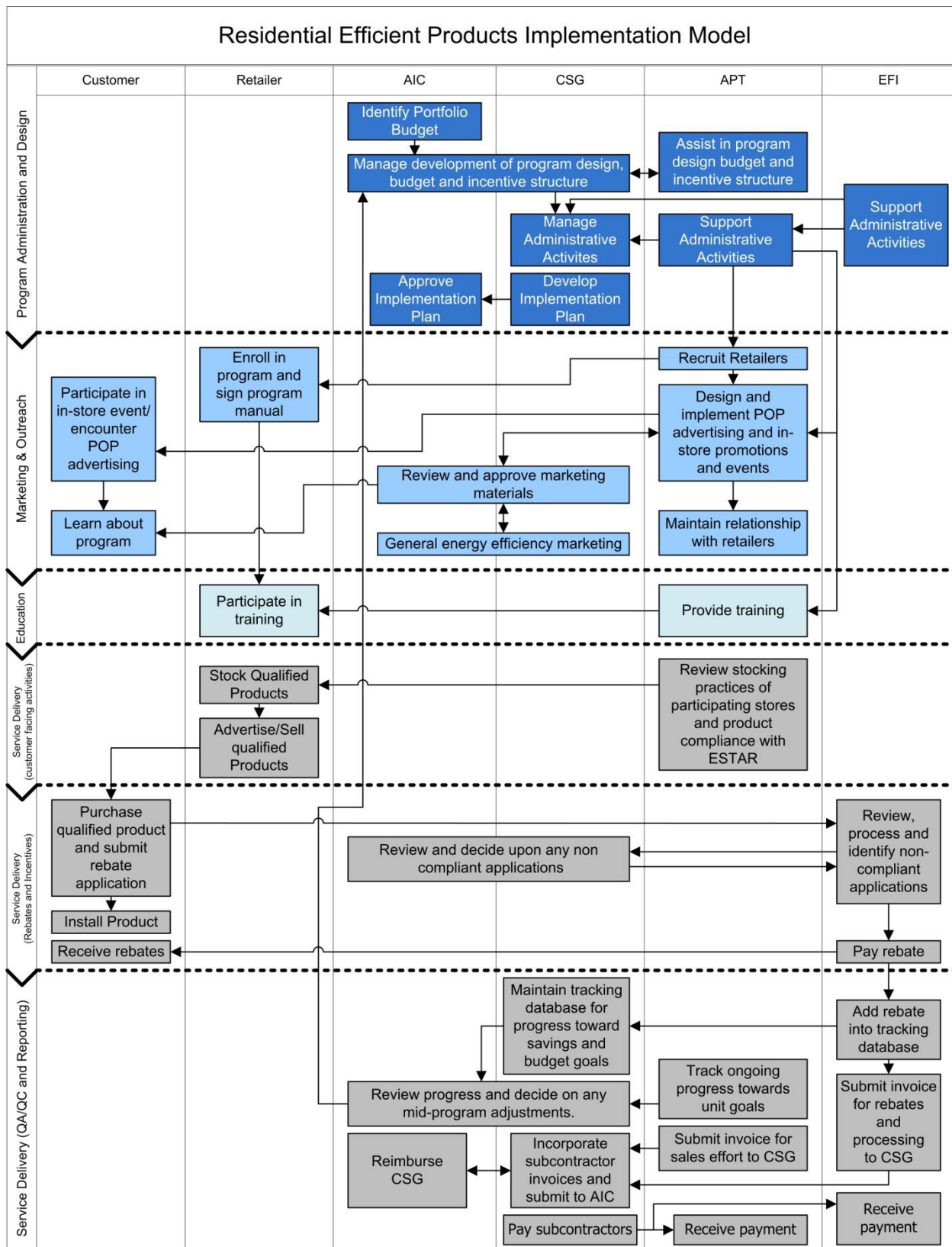
- **Functions** represent the discrete purposes established by the program. They include program design, marketing, customer education, service delivery and QA/QC, and evaluation. “Service delivery” encompasses activities that are directed toward intervention recipients and, as shown in this model, is a catch-all for any activity that does not fit in another function.
- **Stakeholders** are the various providers who are involved in program delivery or those who receive program services. Stakeholders include the customer, retailers and other trade allies, AIC, CSG, APT, and EFI.

We also identified several key points within each of the program functions.

- **Program Administration and Design:** AIC personnel and implementation staff from CSG work together to establish program goals, budgets, and marketing plans. APT also provides assistance in establishing the incentive structure and program budgets.
- **Marketing and Outreach:** APT prepares and implements marketing through POP displays and store promotions.
- **Education:** APT trains retailers on product and program details. Retailers and APT staff conduct education events for customers to inform them about the program, the efficient products offered, and their benefits.
- **Service Delivery (Customer Facing Activities):** Retailers stock products and display POP advertising.
- **Service Delivery (Rebates and Incentives):** Customers submit rebates to AIC through EFI, which in turn processes the application and sends payment to customers. CSG and AIC staff review applications for non-compliance.
- **Service Delivery (QA/QC and Reporting):** EFI tracks rebate form data, loading it into a database that is incorporated into CSG’s overall program database. CSG and AIC review this data to identify where to make changes to the program’s design and implementation. APT and EFI submit invoices to CSG for payment and CSG submits invoices to AIC for work completed and rebates disbursed. CSG pays APT and EFI as subcontractors.

The REEP Implementation model and key follow.





D. APPENDIX: PRODUCT PRICE AND PURCHASING TRENDS FROM PROGRAM TRACKING DATABASE

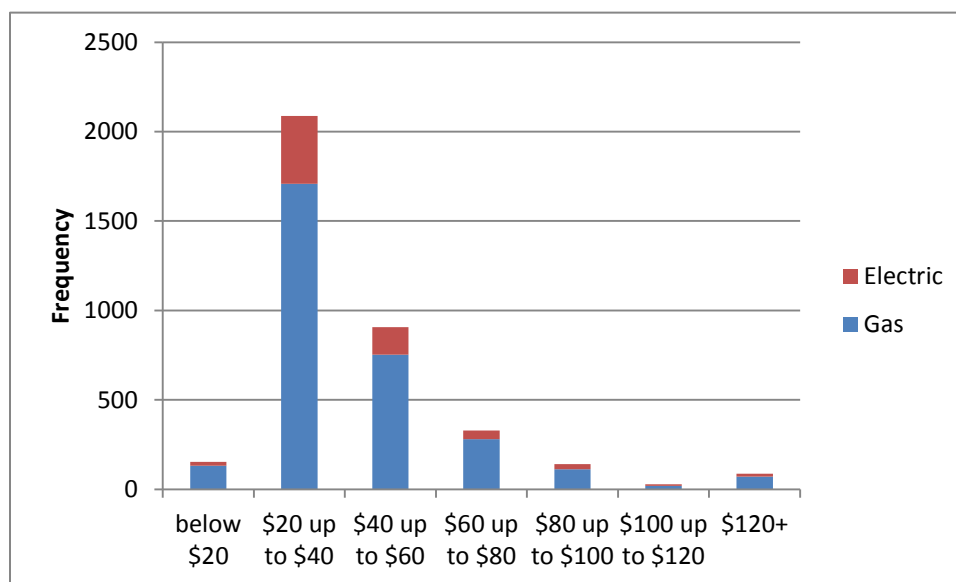
The evaluation team analyzed product-specific data included in the tracking database to provide insight into actual prices paid by customers, the most popular retail outlets, and the most popular brands chosen. For each product, the study examined the range, average, median, and standard deviation of purchase prices, as shown in Table 21. All products experienced significant price variation.

Table 21. Product Price Statistics

Category	Average Price	Median Price	Max Price	Min Price	Standard Deviation
Thermostat	\$44	\$34	\$700	\$10	\$37
Heat Pump Water Heater	\$1,101	\$1,000	\$1,940	\$115	\$278
Gas Water Heater	\$699	\$704	\$1,505	\$189	\$141
Air Purifier	\$142	\$145	\$598	\$14	\$59
Dehumidifier	\$188	\$184	\$448	\$98	\$45
Room Air Conditioner	\$259	\$236	\$1,540	\$98	\$115
Smart Power Strip	\$43	\$34	\$400	\$8	\$32

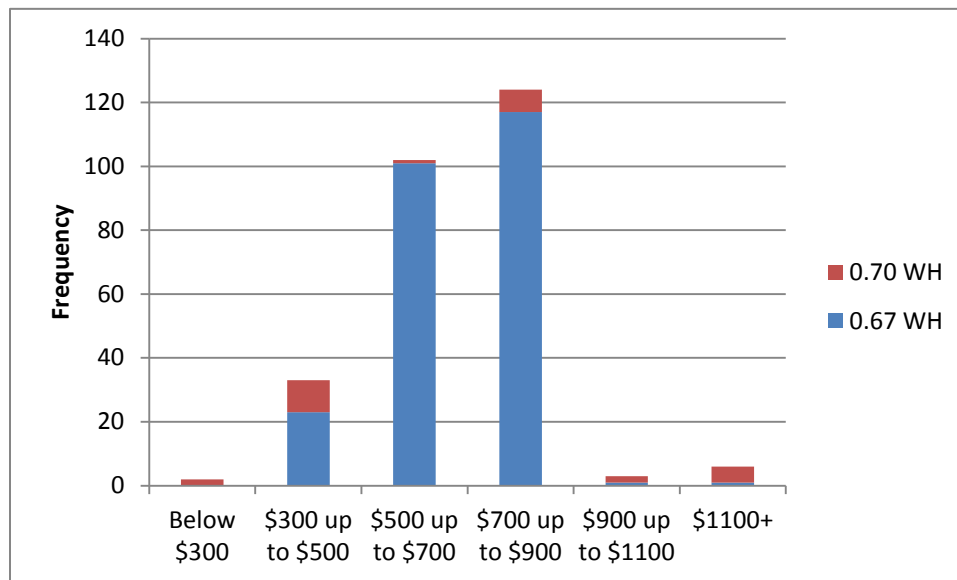
Figure 14 through Figure 20 show price distributions for each product category. As shown in Figure 14, most thermostats fell within the \$20 to \$60 price range.

Figure 14. Thermostat Price Distribution



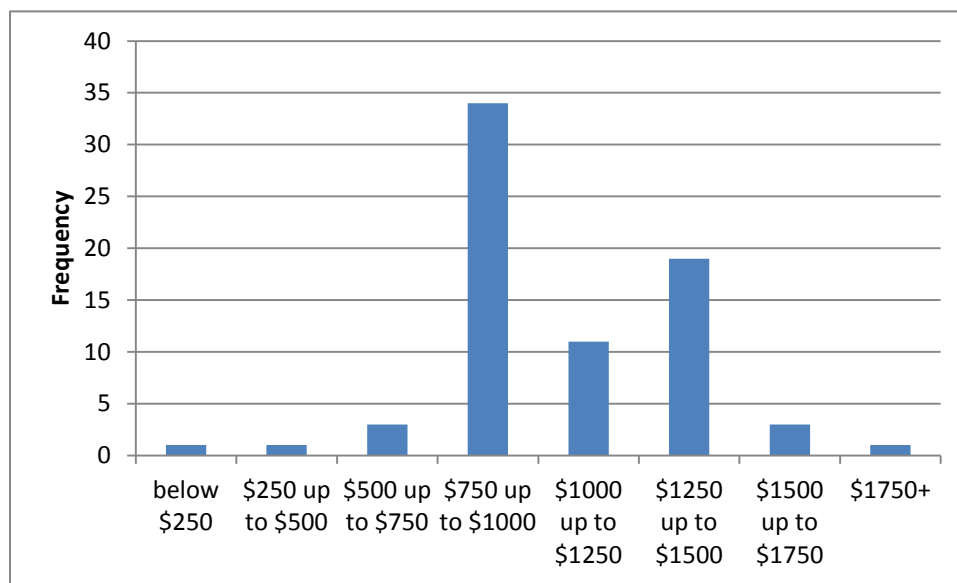
Gas water heaters most likely were priced between \$500 and \$700.

Figure 15. Gas Water Heater Price Distributions



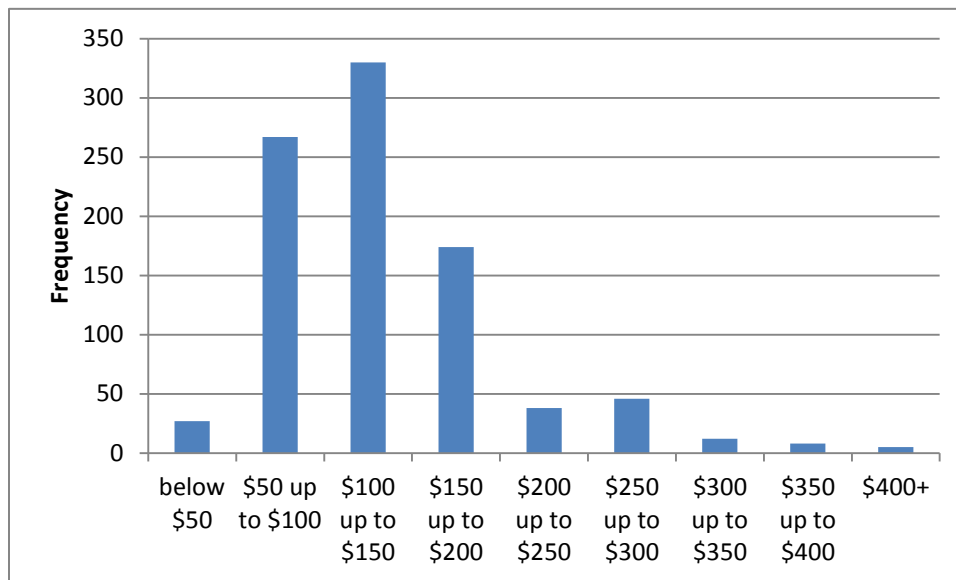
Heat pump water heaters most likely were priced between \$750 and \$1,500.

Figure 16. Heat Pump Water Heater Price Distributions



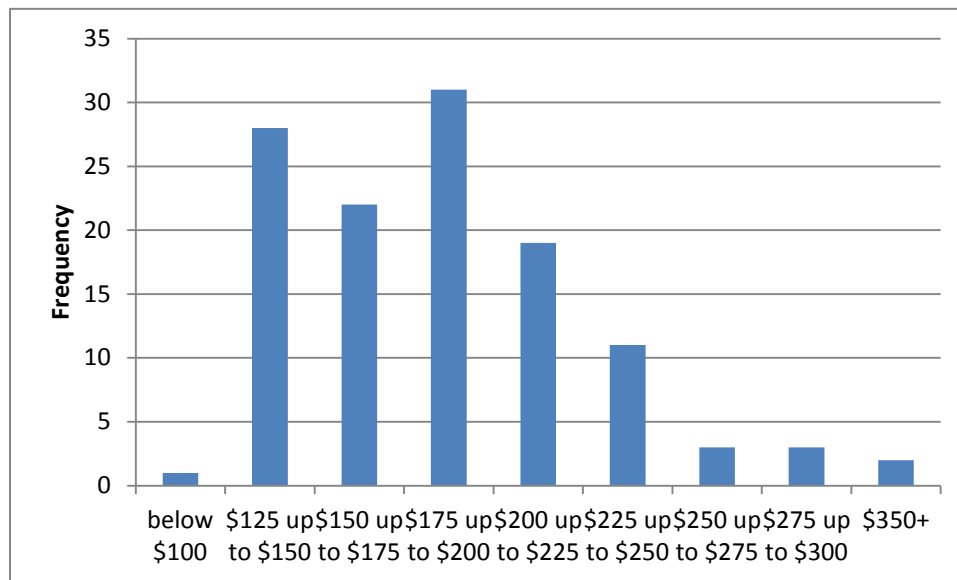
Air purifiers most likely were priced between \$50 and \$150.

Figure 17. Air Purifier Price Distributions



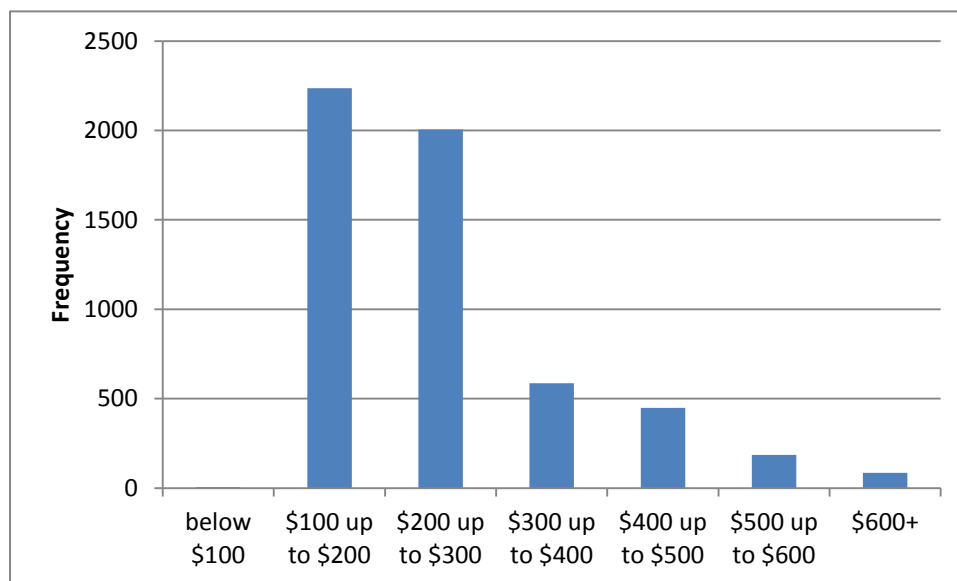
Dehumidifiers most likely were priced between \$125 and \$225.

Figure 18. Dehumidifier Price Distributions



Room air conditioners typically were priced between \$100 and \$300.

Figure 19. Room Air Conditioner Price Distributions



Smart power strips typically were priced between \$20 and \$60.

Figure 20. Smart Power Strip Price Distributions

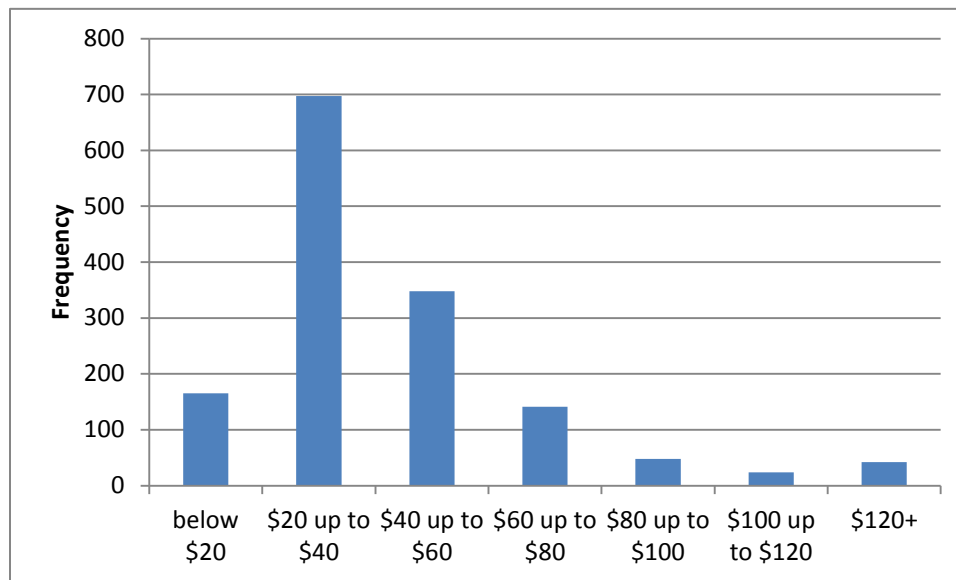


Table 22 and Table 23 show top-selling brands and retailers (by unit volume).

Table 22. Top-Selling Brands by Product Category

Product Category	Brand 1	Brand 2	Brand 3
Thermostat	Honeywell	Hunter	LUX Products
Heat Pump Water Heater	GE	Richmond	Rheem
Gas Water Heater	Richmond	Whirlpool	GE and Powerflex (Tie)
Air Purifier	KAZ INC	Hunter Air	Envion LLC
Dehumidifier	Electrolux and Gree Electric (Tie)		GE
Room Air Conditioner	Frigidaire	GE	Soleusair
Smart Power Strip	Monster	Philips	Woods

Table 23. Top Retailers by Product Category

Product Category	Retailer 1	Retailer 2	Retailer 3
Thermostat	Menards	Lowe's	Wal-Mart
Heat Pump Water Heater	Lowe's	Sears	Menards
Gas Water Heater	Menards	Lowe's	Home Depot
Air Purifier	Wal-Mart	Lowe's	Sam's Club
Dehumidifier	Menards	Lowe's	Home Depot
Room Air Conditioner	Menards	Lowe's	Wal-Mart
Smart Power Strip	Wal-Mart	Best Buy	Menards

Figure 21 shows the number of rebates, for each month through PY4. As expected, this figure indicates strong seasonal influences on purchases of room air conditioners and thermostats.

Figure 21. Number of Rebates Processed by Product Category and Month

