

Memorandum

To: Jonathon Jackson, AIC and Jennifer Morris, ICC Staff
From: Jane Colby, Jeana Swedenburg, Joan Wang, and David Tripamer, Cadmus
Date: February 28, 2017
Re: Residential Nonparticipant Customer Survey Results

Ameren Illinois Company (AIC) is in its ninth year of electric efficiency program operation¹ and conducts general marketing and education both through its programs and in general with AIC residential customers in addition to offering incentives. Over time, this general marketing and education can create non-participant spillover (NPSO) in the general residential customer population. NPSO is additional energy savings by residential AIC customers who adopt energy efficient measures without participating in any program because they are influenced by AIC's general marketing and education efforts. As such, for the program year 8 (PY8) evaluation cycle, the evaluation team conducted a survey of nonparticipating residential AIC customers to identify and quantify nonparticipant spillover (NPSO) that may be occurring through AIC's marketing and education efforts. We also utilized the survey to collect beneficial customer feedback. In particular, we surveyed nonparticipating AIC residential customers to assess their awareness of energy efficiency programs, their attitudes toward energy efficiency in general, and whether they had taken any energy efficiency actions on their own due to AIC's general marketing and education efforts. This memo summarizes our methods and findings. The survey instruments are included as Appendix A and Appendix B.

Key Findings

Given that no protocol for calculating NPSO exists in the applicable Illinois Statewide Technical Reference Manual, Version 4.0 (IL-TRM V4.0), the evaluation team applied the protocol included in IL-TRM V5.0. Based on this approach, we found no NPSO savings from PY8 participants.

In terms of trends in customer attitudes and awareness, our survey analysis inferred that program awareness (residential AIC customers who are able to identify at least one specific AIC program) increased from 19% in PY7 to 27% in PY8. Similar to results from the PY7 nonparticipant survey, customers were most likely to learn about AIC's programs through bill inserts. Further, while over 90% of customers feel that energy efficiency is important, approximately one-quarter believe their home is somewhat or not very energy-efficient. The top reason among those believing their home is inefficient is "*the home is drafty.*"

Most customers (approximately 90%) report they take some actions to reduce their energy use. The most common actions were turning off lights and appliances when not in use. Those stating they used a programmable thermostat to save energy increased from 14% to 23% between PY7 and PY8 (statistically significant at the 95% confidence level). Of those who stated challenges to saving energy, the most common challenge listed (18%) was cost.

¹ AIC is in its sixth year of natural gas efficiency program operation.

Overall, AIC customers are more satisfied with AIC compared to PY7 (statistically significant increase at the 95% confidence level) – scoring an average of 7.8 out of 10. Those aware of AIC’s conservation programs rated AIC higher – 8.1 out of 10 (statistically significant at the 90% confidence level).

Survey Methodology

In November 2016, the evaluation team conducted telephone surveys with 350 nonparticipating residential AIC customers. Nonparticipants are customers who did not participate in an AIC program or receive a home energy report through the Behavioral Modification Program in the past three years. The survey objectives were to:

- Gauge customer awareness of AIC energy efficiency programs
- Assess customer satisfaction with AIC
- Explore customers’ energy efficiency awareness, attitudes, and actions
- Identify potential spillover measures and quantify the savings associated with them

The evaluation team called nonparticipants from a sample frame of 6,000 customers randomly chosen from the entire nonparticipant population.² We called customers from the sample frame until we reached 350 completes. On average, we called each customer five times. Table 1 provides the survey dispositions.

² AIC provided the evaluation team with its residential customer database. The evaluation team removed customers who had participated in an AIC program during the previous three years to determine the nonparticipant population to draw the survey sample.

Table 1. Residential Nonparticipant Survey Disposition

Disposition	N
Sample	6,000
Sample Not Used	1,497
Total Phone Numbers Used	4,503
Completed Surveys (I)	350
Eligible Incompletes (P)	33
Ineligible Non-Surveys (X)	1,121
Survey-Ineligible Households (X1)*	254
Non-Households	867
Unknown Eligibility Non-Surveys (U)	2,999
Undetermined If Households (UH)	404
Estimated Proportion of Sample That Are Households (e2)	79%
Households Undetermined If Survey-Eligible (UO)	2,595
Hard Refusal (R)	980
Soft Refusal**	725
Non-Contact (NC)	872
Language Problem (O)	18
Estimated Proportion of Households That Are Survey-Eligible (e1)	60%

* Households that received AIC rebates or home energy reports.

** Households that requested callbacks.

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 the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR). We chose to use AAPOR Response Rate 3 (RR3)³ for all AIC program evaluations because we are often unable to determine the eligibility of all sample units through the survey process. RR3 allows for an estimate of eligibility for these unknown sample units, which we derived using two separate incidence rates, e1 and e2. The formulas used for these incidence rates are presented below; their definitions are in Table 1.

$$e1 = \frac{(I + P)}{(I + P) + X1} \quad (1)$$

³ American Association for Public Opinion Research. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. Pp. 62. Revised 2016. Available online: https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf.

$$e2 = \frac{(I + P) + X1 + UO}{(I + P) + X1 + UO + X2} \quad (2)$$

We present the formula used to calculate RR3 below.⁴

$$RR3 = \frac{I}{(I + P) + e1[UO + e2(UH)]} \quad (3)$$

We also calculated a cooperation rate, which is the number of completed interviews divided by the total number of sample units actually contacted. In essence, the cooperation rate gives the percentage of respondents who completed an interview out of all of the respondents with whom we actually spoke. We used AAPOR Cooperation Rate 3 (COOP3)⁵, which is calculated as:

$$COOP3 = \frac{I}{(I + P) + R} \quad (4)$$

Table 2 provides the PY8 response and cooperation rates.

Table 2. Residential Nonparticipant Survey Response and Cooperation Rate

AAPOR Rate	PY8 Percentage
Response Rate (RR3)	16.4%
Cooperation Rate (COOP3)	25.7%

In the Respondent Characteristics section of this memo, we compare some demographics of respondents from this survey to an AIC service territory survey from 2011 and to the Illinois Statewide American Community Survey (ACS). We found that the survey respondents are similar to the state of Illinois' general population in terms of the age of homes, but are more likely to live in a single family home and are more likely to own their home relative to the general population of Illinois. We also note that there is a potential for additional non-response bias, as respondents may be systematically different than the eligible non-respondents in the sample in terms of characteristics we did not measure.

⁴ Whereas the AAPOR treated hard refusals (R), soft refusals, non-contacts (NC), and language problems (O) as eligible non-surveys, we treated them as households with unknown survey eligibility (UO) because they did not get the second round of screening during the survey.

⁵ American Association for Public Opinion Research. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. Pp. 63. Revised 2016. Available online: https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf.

NPSO Methodology

The survey asked respondents a number of questions designed to identify potential spillover measures. Specifically, the survey asked respondents if they are aware that AIC offers energy efficiency programs or incentives whether they made improvements that did not receive a rebate, and if so, what was installed and how they know it is energy efficient. Customers who reported having installed energy efficiency improvements without a rebate and in AIC's service territory received follow-up calls from evaluation team technical staff to gather additional technical information about the measure to estimate savings, and to verify whether the savings are attributable to AIC. See Appendix B for the follow-up survey questions.

The evaluation team applied an approach consistent with the IL-TRM V5.0 to estimate NPSO savings.⁶ In general, to receive credit for NPSO savings, a nonparticipant who installed efficient equipment must meet the following requirements:

- Be familiar with AIC's energy efficiency programs
- Indicate that some aspect of the program motivated their purchasing decision (Attribution Score 1)
- Indicate that they would not have installed the measure if they had not known about energy efficiency from AIC or its programs (Attribution Score 2)

The formula to determine the Spillover Score (per the IL TRM V5.0) is:

$$\text{Spillover Score} = (\text{Attribution Score 1} + (10 - \text{Attribution Score 2}))/2.$$

The IL-TRM V5.0 defines Attribution Score 1 as, "The influence level (on a scale of 0 to 10, where 10 is extremely influential and 0 is not at all influential) the Program Administrator had on the decision to purchase the measure."⁷ Attribution Score 2 is, "the likelihood (on a scale of 0 to 10, where 10 is highly likely and 0 is not at all likely) that the customer would have installed the measure had they not been influenced by the program."⁸ In order to have 100% of the savings attributed to AIC, a respondent's Spillover Score must be greater than 7.0.⁹

Table 3 shows an example of how electric or gas savings from NPSO is calculated. Column F shows the average savings per surveyed customer, determined by dividing the total allocated savings (sum of column E) by the number of completed surveys.

⁶ Recall that we are using the IL TRM V5.0 because there is no algorithm for NPSO savings in the IL TRM V4.0 (which is the applicable TRM for PY8). The IL TRM 4.0 includes a note about how the evaluation teams have yet to come to a consensus on how to measure nonparticipant spillover.

⁷ Illinois Energy Efficiency Stakeholder Advisory Group. *Illinois Statewide Technical Reference Manual for Energy Efficiency, Version 5.0, Volume 4: Cross-Cutting Measures and Attachments*. Section 4.1.4. December 2016. Available online: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Effective_060116_v5.0_Vol_4_X-Cutting_Measures_and_Attach_021116_Final.pdf

⁸ *Ibid.*

⁹ The threshold for minimum Spillover Score attributable to NPSO savings given in the IL TRM V6.0 is greater than 5.0 while in IL TRM V5.0 that value is greater than 7.0.

Table 3. Estimation of Respondents' Nonparticipant Spillover Savings

A	B	C	D	E	F
Spillover Measure	Spillover Score	Measure Savings (kWh or Therms)	Allocated Savings	Total Savings	Average Savings Per Surveyed Customer
Measure1	Scale of 0 to 10	Savings1	100% if [B] > 7.0 0% if [B] ≤ 7.0	[C] * [D]	N/A
Measure2	Scale of 0 to 10	Savings2		[C] * [D]	
MeasureN	Scale of 0 to 10	SavingsN		[C] * [D]	
				Sum of column E = Total kWh Savings	Total kWh Savings / Number of Completed Surveys

Table 4 provides the calculation methodology for estimating the total NPSO. The approach calls for extrapolating savings from the survey population to the entire nonparticipating residential customer population to estimate overall NPSO in kWh or therms. NPSO is converted into a percentage of net savings by dividing by the sum of the program savings for the total portfolio. Because the Behavior Modification Program savings are calculated only on a net basis, the final NPSO percentage should be applied to the net portfolio savings rather than gross savings.

Table 4. Calculation Methodology of Total Nonparticipant Spillover Generated

Variable	Description	Source/Calculation
F	Average kWh Energy Savings per Surveyed Customer	Survey data and impact evaluation
J	Total Nonparticipant Residential Population	Customer database
K	NPSO MWh Energy Savings Extrapolated to Nonparticipant Population	$[F * J] / 1,000 \text{ kWh/MWh}$
S	Total Evaluated MWh Savings	PY8 Integrated Report
G	NPSO as Percentage of Total Evaluated Savings	K / S

Detailed Results

This section of the memo provides the detailed results of our NPSO analysis followed by an analysis of each of the other topics covered in the nonparticipant survey (Awareness of Efficiency Programs; Satisfaction with AIC; Energy Efficiency Awareness, Attitudes, and Actions; and Respondent Characteristics).

NPSO Results

Of the 350 survey respondents, the team identified 143 (41%) who were aware that AIC implements energy efficiency programs. Of those aware, 17 reported having installed energy-efficient equipment in the past year for which they had not received a rebate from AIC (this excludes customers who installed efficient lighting

measures).¹⁰ Seven of the seventeen customers were able to cite evidence that the equipment they purchased was efficient in our follow-up interview by a member of our technical staff.¹¹

Five of the seven customers that could provide evidence of having purchased and installed efficient equipment did not qualify for NPSO savings because their knowledge of AIC energy efficiency programs did not factor into their decision to install the energy-efficient measures.¹² These customers said they were simply replacing broken equipment or appliances with energy-efficient equipment or appliances.

The remaining two customers had Spillover Scores of 4.0 and 6.5. Table 5 shows the calculation of these customers' Spillover Scores.

Table 5. Spillover Score Calculations for Eligible Customers

Customer	Attribution Score 1	Attribution Score 2	Spillover Score
1	8	10	4.0
2	10	7	6.5

Table 5 shows that while both customers had a high Attribution Score 1 (indicating that some knowledge of AIC's energy efficiency program greatly influenced their purchasing decisions), these customers also had high values for Attribution Score 2 (indicating that it is very likely they would have installed the energy-efficient equipment even without their knowledge of AIC's energy efficiency program).¹³ The evaluation team investigated these potentially conflicting responses through follow-up questions and learned that both customers were replacing inoperable equipment and had been planning or considering purchasing energy-efficient equipment once their current equipment became inoperable. Thus, while both customers indicated that they were influenced by their knowledge or awareness of AIC's energy efficiency programs, both customers also indicated they were likely to install the efficient equipment regardless of AIC's programs.¹⁴ Based on these responses, we did not find evidence to suggest adjusting the average score.

As defined in IL TRM V5.0, NPSO is counted if the final Spillover Score is greater than 7.0, which did not occur for either of the customers discussed herein. Therefore, we report zero NPSO savings from PY8 customers.

¹⁰ We excluded customers who installed efficient lighting measures because those were analyzed as part of the upstream lighting program.

¹¹ This is comparable to PY7 results, where 15 customers reported that they had installed energy-efficient equipment and six customers were able to provide evidence that the equipment they installed was efficient.

¹² Specifically, these customers answered "no" to all parts of question A1 in the follow-up survey (found in Appendix B Nonparticipant Survey – Cadmus Follow Up).

¹³ We discuss the two Attribution Scores in more detail in the NPSO Methodology section above.

¹⁴ These customers indicated that while they had prior plans to purchase energy efficient equipment when their existing equipment needed replacement, the knowledge of AIC's energy efficiency programs provided confirmation and encouragement of their plans.

Sensitivity Analysis

As a sensitivity analysis, we also calculated NPSO that would occur if the threshold were 5.0 rather than 7.0 because version 6.0 of the IL-TRM has an updated protocol with a lower Spillover Score threshold, as recommended by the Illinois Residential Net-to-Gross Working Group. Using the IL-TRM V6.0 protocol, one of the customers' energy-efficient measures from Table 5 would qualify for NPSO. This particular customer installed an efficient air-source heat pump and did not receive a rebate from AIC. We estimated this customer's savings from the new heat pump following IL-TRM V4.0 based on a time of sale transaction for a single family home. The customer provided the manufacturer and model number,¹⁵ and indicated that they used the heat pump for both heating and cooling. The results of this analysis provided savings of 1,093 kWh. Table 6 shows the estimation of NPSO as a percentage of PY7 total evaluated net kWh savings given that PY8 savings are not yet available.¹⁶

Table 6. Sensitivity Analysis Calculating NPSO From IL TRM V6.0 Threshold

Variable	Description	Energy Calculations/Results
F	Average Energy Savings per Surveyed Customer	1.093 MWh/350 customers = 0.0031 MWh/customer
J	Total Nonparticipant Residential Population*	706,985
K	NPSO MWh Savings Extrapolated to Population	2,208
F	Total Evaluated Net MWh Savings†	117,519
G	NPSO as Percentage of PY7 Total Evaluated Net Savings	1.88%

* Calculated by removing participants from AIC-provided customer list.

† The evaluation team used PY7 residential portfolio *ex post* net MWh impacts as an estimate until final PY8 results are available.

Awareness of Efficiency Programs

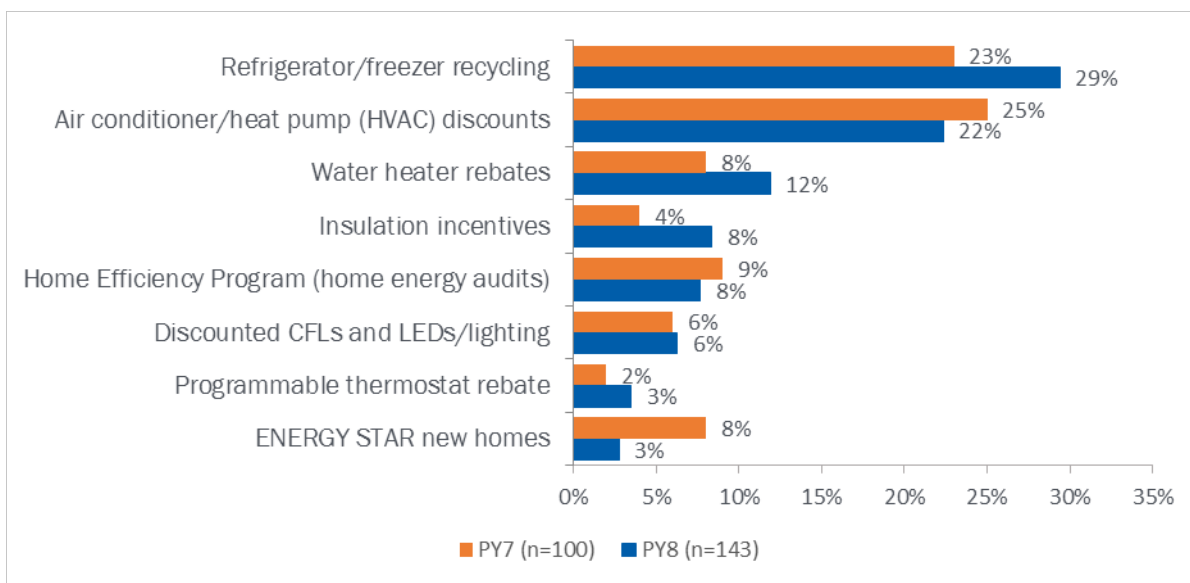
Based on their ability to name a specific AIC program, 27% of all 350 respondents were aware of specific programs. The evaluation team first asked a general yes/no awareness question about AIC programs, which revealed that 143 respondents (41%) were aware that AIC offered incentives for specific equipment and home improvements. We asked a follow-up question to the 143 respondents asking if they could name a specific program, and 49 respondents (34%) were not able to name a program. Therefore, just 27% of all 350 respondents can name a specific AIC program. This is a statistically significant increase from the PY7 results at a 95% confidence level, when only 19% of all 350 respondents could name a specific AIC program.

¹⁵ The customer did not provide the full model number, only the first part of the model number. We were able to find the efficiencies, but had to assume the capacities. Since the equipment was installed in a single family home, we assumed a heating and cooling capacity of 36,000 Btuh. Note that this is the most common size of heat pump purchased through AIC's Heating and Cooling program.

¹⁶ Opinion Dynamics. *Ameren Illinois Company Electric & Gas Residential, and Commercial and Industrial Energy Efficiency Portfolios – PY7 Integrated Evaluation Report*. Table 1. October 26, 2016.

Among those respondents who were aware of at least one specific program, most mentioned rebates from the Appliance Recycling (29%) and Residential Heating and Cooling (22%) programs. Figure 1 reveals that 6% of respondents were aware of the upstream Residential Lighting Program,¹⁷ and fewer know about rebates for programmable thermostats (3%) or the ENERGY STAR New Homes program (3%). Figure 1 also shows that the individual program awareness trends are similar across PY7 and PY8.

Figure 1. Program Awareness Trends in PY7 and PY8 (Multiple Responses Allowed)*

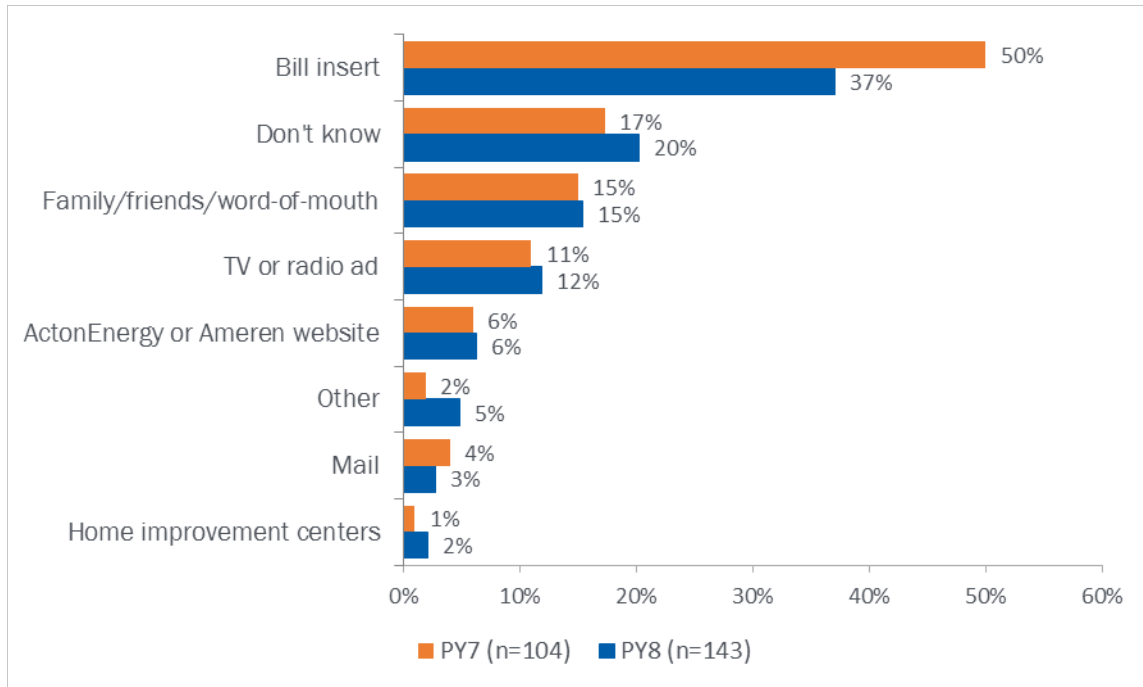


* Survey question A5: What rebates or discounts have you heard about? Two respondents should not have been asked the survey question, according to the survey skip pattern. We therefore omitted these respondents in the analysis, which lowered the number of respondents from 145 to 143.

As shown in Figure 2, the majority of respondents (37%) learned about AIC's programs through their utility bill. Respondents also frequently mentioned word of mouth (15%) and radio or television ads (12%). Twenty percent of respondents did not know or remember how they learned about AIC programs. Some of the other categories not shown in Figure 2 included hearing about AIC programs in conferences (n=2), in the mail (n=3), and when filing taxes (n=2). The top response categories are similar between PY7 and PY8.

¹⁷ This is not uncommon due to the upstream and transparent nature of the program.

Figure 2. How Respondents’ Heard of AIC Programs in PY7 and PY8 (Multiple Responses Allowed)*



* Survey question A6: Where did you hear or read about Ameren Illinois’ energy efficiency rebate opportunities? (Figure shows comparison of top responses). One PY8 respondent should not have been asked the survey question, according to the survey skip pattern. We, therefore, omitted this respondent in the analysis, which lowered the number of respondents from 144 to 143.

When asked about the best way for AIC to provide them with information about energy efficiency programs and rebates; almost three quarters (70%) indicate that providing information through their monthly bill is the best mode of communication; approximately 18% prefer email.¹⁸ Compared to PY7 survey results, respondents’ preferred modes of communication have remained the same. In addition, 91% of respondents who learned about AIC’s energy efficiency rebate opportunities from their monthly bill prefer this mode of communication.

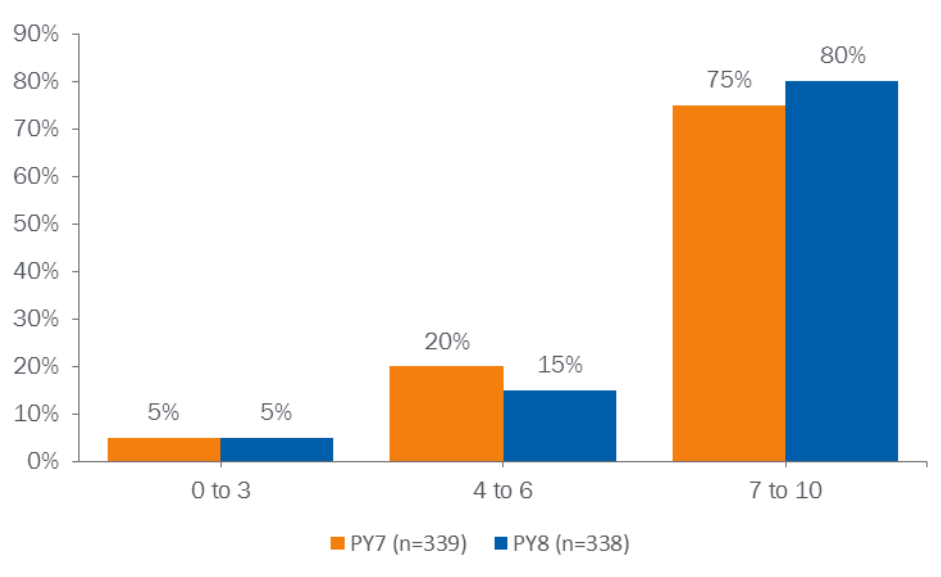
Satisfaction with AIC

In the survey, the evaluation team asked about customers’ satisfaction with AIC as a utility provider. Based on a 10-point scale, with 0 being very dissatisfied and 10 being very satisfied, 66% of respondents rated their satisfaction as an 8 or higher, compared to 55% in PY7. PY8 respondents gave an overall mean satisfaction score of 7.80, which is significantly higher than PY7’s overall mean score of 7.45.¹⁹ Figure 3 shows the distribution of satisfaction scores in PY7 and PY8.

¹⁸ Survey question A16: What is the best way for Ameren Illinois to provide you with information about energy efficiency programs and rebates? (PY7 n=350, PY8 n=350; multiple responses allowed).

¹⁹ Difference is statistically significant at the 95% confidence level.

Figure 3. Respondents' Satisfaction with AIC as a Utility Provider in PY7 and PY8*



* Survey question A20: How would you rate your satisfaction with Ameren Illinois overall? (Customers who responded “don’t know” or “refused” are excluded).

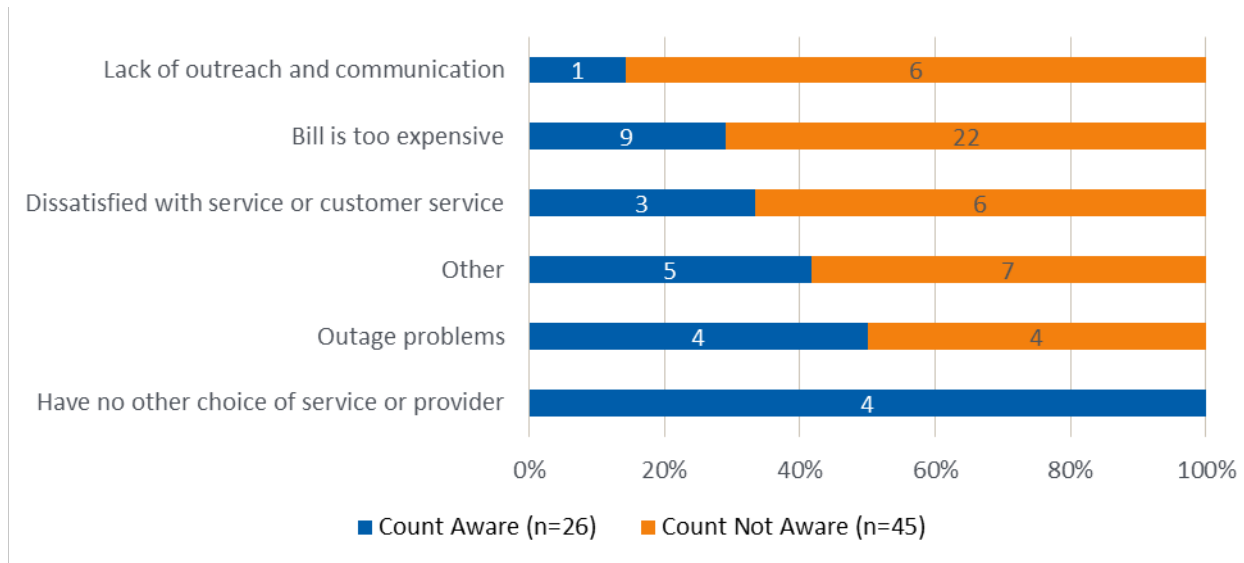
The evaluation team also asked follow-up questions of the 89 respondents who gave a satisfaction score of seven or below in PY8 to determine their reasoning for the score.²⁰ As shown below, customers are most frequently dissatisfied due to their bills, as well as general customer service from AIC of customer, followed by a number of other reasons:

- Utility bills are too expensive (35%)
- Dissatisfied with general service or customer service (12%)
- Outage problems (9%)
- Lack of customer outreach and communication (8%)
- No other choice of services or providers (4%)

The team compared the mean satisfaction scores of respondents who were aware of AIC programs and respondents who were not aware of the programs. The mean satisfaction score for those aware of AIC programs was 8.1, compared to 7.7 for those who were unaware, a statistically significant difference at the 90% confidence level. This indicates a positive correlation between awareness of AIC programs and satisfaction with AIC as a utility provider. Figure 4 illustrates the correlation between dissatisfaction and unawareness of AIC programs.

²⁰ Survey question A21: Please say more about why you gave this rating. (n=89). Out of the 116 respondents who gave a satisfaction score of 7 or below, 19 did not know the reason for their score and eight refused to explain their score. As a result, the team only analyzed 89 respondents' reasons.

Figure 4. Respondents' Reasons for Satisfaction Scores Below 7 Compared to Awareness of AIC Programs*



* Survey Question A21. Please say more about why you gave this rating (customers who gave positive feedback for satisfaction scores below 7 were excluded).

Although there is a correlation between dissatisfaction and unawareness of AIC programs, satisfied customers are not necessarily aware of AIC programs. The survey revealed that of the 228 customers who provided a rating of eight or higher, more than half (57%) were unaware of AIC's programs. The degree of unawareness among satisfied customers was similar to the PY7 survey results (59%).

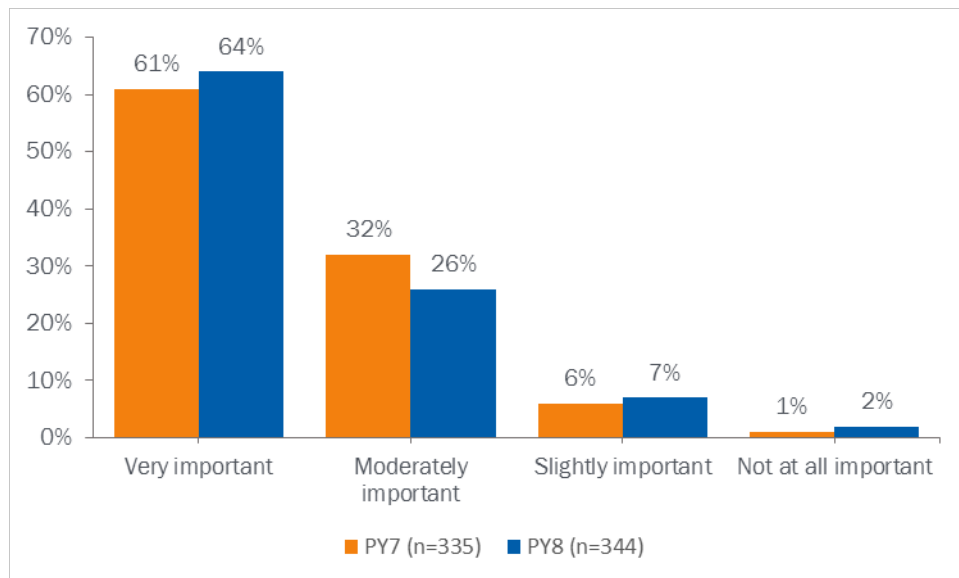
Energy Efficiency Awareness, Attitudes, and Actions

The evaluation team also asked a set of questions about energy efficiency awareness, attitudes and actions. Specifically, we asked customers how important saving energy was to them and to rate how efficient their homes were. We also asked respondents to rate their own level of energy efficiency knowledge, the actions they have taken to make their home more energy efficient, and the challenges they have faced trying to save energy in their home. The following sections provide our findings on these topics.

Importance of Saving Energy

Nearly all respondents (90%) said that saving energy in the home is important to them, as displayed in Figure 5. These results are similar to responses from PY7, when 93% of respondents said that savings energy is very or moderately important and only 1% said it was not at all important.

Figure 5. Importance of Saving Energy at Home in PY7 and PY8*



* Survey Question A17. How important is saving energy in your home? Would you say... (Customers who responded “don’t know” or “refused” were excluded). Note that the wording changed slightly in PY8. In PY7, the choices were *very important*, *somewhat important*, *not too important*, and *not at all important*. The figure shows the wording used in PY8.

Efficiency of Respondents’ Homes

As Figure 6 shows, in PY8, the majority (76%) perceive their homes to be very or somewhat efficient. This is similar to the 74% result from PY7. In PY8, the team asked respondents to provide a reason for their rating of home efficiency.²¹ The respondents who believed their homes to be very or somewhat efficient provided the following top reasons:

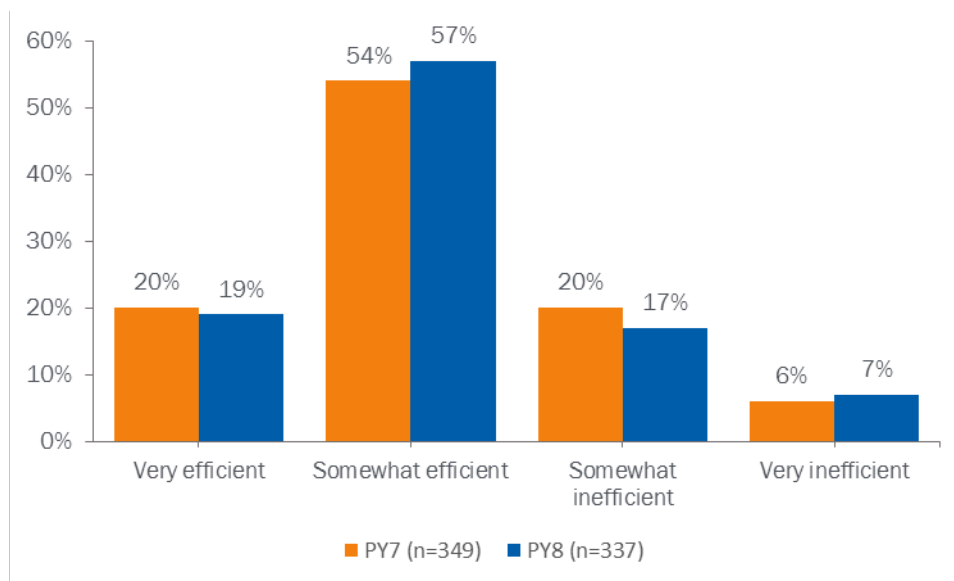
- Home has insulation (40%)
- Efficient or newer appliances (27%)
- Efficient lighting (17%)
- Newer home (16%)
- Efficient or newer windows or doors (12%)

²¹ Survey question A13: What makes your home [very/somewhat inefficient/efficient]? (PY7 n=312, PY8 n=313; multiple responses allowed; customers who responded “don’t know” or “refused” were excluded). Since respondents provided their reasoning in an open-ended fashion, the team was unable to interpret some of the responses such as “comparing to other homes” or “crawl space.” As a result, we omitted 39 responses from the analysis. In addition, we excluded contradictory responses such as “Efficient lighting” if the respondents believe their homes were *inefficient*.

Among the approximately one-quarter of respondents in both years who think their home is either *somewhat inefficient* or *very inefficient* because of the following:

- Home is draft/leaky (49%)
- Older home (44%)
- Home lacks insulation (38%)
- Inefficient or older appliances (10%)
- Utility bills are expensive (5%)

Figure 6. Perceived Efficiency of Respondents' Homes in PY7 and PY8*



* Survey Question A12. How energy-efficient would you say your home is currently? (Customers who responded “don’t know” or “refused” were excluded).

Respondents' Knowledge and Actions in Conserving Energy

The team asked respondents to rate their knowledge of how to improve their home’s efficiency. Using a 10-point scale, with 0 being not at all knowledgeable and 10 being very knowledgeable, respondents in PY8 gave a mean response of 7.0 on their knowledge of how to improve home efficiency.²²

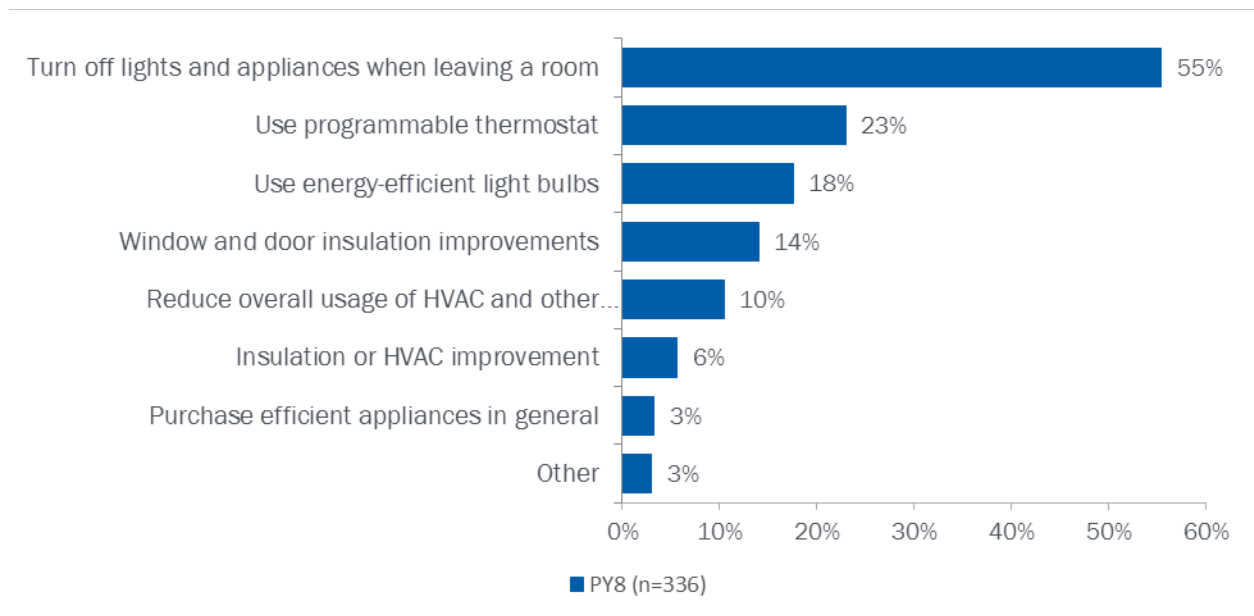
In addition, the team asked respondents about the ways they currently save energy at home. Ten percent of respondents admitted that they do not take any action to save energy at home.²³ As shown in Figure 7, the

²² Survey question A19: On a scale from 0-10, where 0 is not at all knowledgeable and 10 is extremely knowledgeable, how would you rate your understanding of ways to make your home more energy efficient? (PY7 n=344, PY8 n=333; customers who responded “don’t know” or “refused” were excluded).

²³ This percentage does not include the 13 respondents who responded “don’t know” to the question. If including these respondents, the percentage would be 13%.

respondents who said they conserve energy most frequently turn off the lights and appliances when leaving the room (55%), use a programmable thermostat (23%), and use energy-efficient light bulbs (18%). In both PY7 and PY8, turning off lights and appliances was the most frequently mentioned energy efficiency action, whereas using a programmable thermostat and using energy efficiency light bulbs have become more common. The proportion of respondents who used a programmable thermostat to save energy has statistically increased from 14% in PY7 to 23% in PY8 at the 95% confidence level.

Figure 7. How Do You Conserve Energy in Your Home? (Multiple Responses Allowed)*



* Survey question A11. What, if any, actions do you currently take to save energy in your home? (Figure represents the top responses, and customers who responded “don’t know” or “refused” were excluded).

Other than the aforementioned behavioral actions, Figure 7 also reveals that 10% of respondents reduce their overall usage of HVAC and other appliances as a way to conserve energy. Example responses include, “I cover up instead of using the heater” and “minimize usage of electric appliances.”

While behavioral changes are more common, respondents also mentioned equipment or shell improvements:

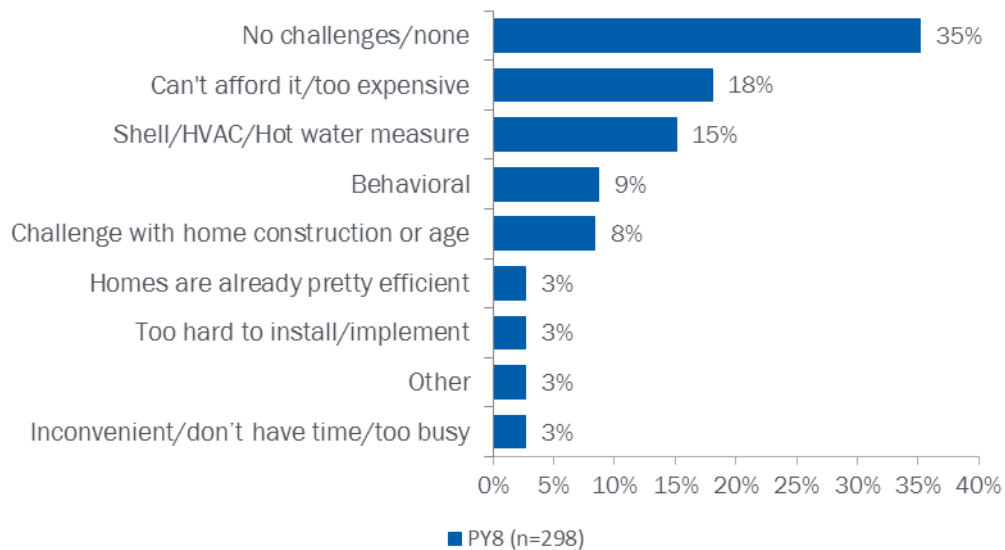
- 14% of respondents claimed to have made window and door insulation improvements such as caulking or replacing inefficient windows
- 6% of respondents conducted HVAC and/or other insulation improvements
- 3% of respondents indicated that they generally purchase energy-efficient appliances

Although respondents said they made changes in their homes, such as improving insulation or adding efficient doors and windows, we did not include these respondents in our assessment of NPSO, because these respondents did not meet the other criteria for inclusion in NPSO: having awareness of AIC programs and acknowledging the impact of AIC programs on their decision-making process.

Challenges with Saving Energy

Finally, the team asked respondents to list the challenges, if any, they faced in savings energy in their homes.

Figure 8. Challenges with Saving Energy in your Home (Multiple Responses Allowed)*



* Survey question A18. What challenges, if any, do you face in saving energy in your home? (Figure represents the top responses, and customers who responded “don't know” or “refused” were excluded).

As shown in Figure 8, 35% of respondents said they did not face any no challenges with saving energy in their home. This could mean that respondents genuinely do not think they have faced any challenges or that they do not perceive typical barriers to be challenges. There is no statistically significant difference between the reported annual household pre-tax income levels of the respondents who faced no challenges and the respondents who faced some challenges. Therefore, there is no evidence to suggest that those who do not have challenges are more financially able to save energy in their homes.

Out of the 226 respondents who said that their home was very efficient or somewhat efficient, 51% listed a specific challenge to saving energy in their home.

Among those citing challenges, respondents mentioned energy-efficient measures being too expensive (18%), a specific shell/HVAC/hot water heater measure²⁴ (15%), and behavioral challenges (9%) such as living with people that do not make an effort to conserve energy (e.g. residents of respondents' homes leaving lights or appliances on) as challenges to saving energy in their homes. Eight percent of people cited the home construction or age being a challenge with saving energy. The responses categorized as “other” included “my health” (presumably poor health making it difficult to implement efficient measures/actions) and “swimming pool” (presumably a pool pump or heater). The remaining choices given in the survey were not included in Figure 8 because 1% or less of customers cited those as challenges with saving energy in their homes.

²⁴ By this, we mean the respondent cited a specific piece of equipment or item in their home that constitutes a challenge with saving energy – such as windows or a heating system.

Respondent Characteristics

Finally, we asked respondents to provide some information about primary fuel types and demographic information. Since the Behavior Modification Program is conducted with approximately one-third of AIC's residential customers, respondents to this survey (which did not include participants of the Behavioral Modification Program or any other AIC program) may differ from overall AIC customer demographics. To gauge the representativeness of survey respondents to AIC's residential customer population, we used several data sources to represent AIC's residential customer population, and compared these data sources to the survey respondents' characteristics.

Primary Fuel Types

The team asked respondents about the primary fuel used to heat their home.²⁵ Most respondents (65%) use gas to heat their home, while 26% use electric and 6% use propane. These results are comparable to a 2011 saturation study by EnerNOC Utility Solutions, in which 69% of AIC customers used natural gas to heat their homes, 19% used electricity, and 12% used some other fuel type.²⁶ In terms of the water heater fuel type,²⁷ 59% of the nonparticipant survey respondents reported having gas water heaters and 35% reported having electric water heaters (about 5% of respondents reported they use propane). The EnerNOC study from 2011 found slight differences to the results of this survey, in which 74% of AIC customers had natural gas water heating fuel, 23% had electric water heating fuel, and 2% had some other water heating fuel type.

Demographics

In terms of demographics, the team asked about the types of dwelling, household sizes, ownership, household income, and the ages of homes. The majority of respondents (79%) live in a single-family dwelling, out of which 85% were owners. The majority (82%) of respondents said their home has three or fewer occupants, including the respondent. 60% of respondents said their annual household pre-tax income is \$50,000 or less. Regarding the ages of the homes:

- 32% of the homes were constructed before 1951
- 57% of the homes were constructed between 1951 and 2000
- 11% of the homes were constructed after 2000

Where possible, the evaluation team compared the demographic data from survey respondents to statewide U.S. Census data, available from the ACS for households in Illinois.²⁸ In doing so, the team is using the ACS

²⁵ Nine respondents did not know the primary fuel used to heat their home, so we excluded them from this analysis.

²⁶ EnerNOC Utility Solutions. *Ameren Illinois Energy Efficiency Market Potential Assessment*. Figure 10-7 Distribution of Heating Technologies. July 8, 2013. Available online: <https://www.illinois.gov/sites/ipa/Documents/AppendixB-4vol1-5AmerenPotentialStudy.pdf>.

²⁷ Thirty-two respondents did not know the primary fuel type for their water heater, so the team excluded them from this analysis.

²⁸ American Community Survey. *Selected Housing Characteristics 2011-2015 American Community Survey 5-Year Estimates*. ID DP04. Available online: <https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t> (search: "Housing" "Illinois").

data as a proxy for demographics of the AIC residential customer base. Table 7 compares demographics from PY8 to that of PY7 and the ACS data.

Table 7. Demographic Data Comparison

Field	AIC PY8 Nonparticipant Survey Respondents	AIC PY7 Nonparticipant Survey Respondents	ACS 2011-2015
Percentage single family	78%	63%	59%
Percentage ownership	76%	61%	66%
Percentage of homes constructed after 1950	68%	67%	71%
Annual household pre-tax income*	\$25,000-\$50,000	\$50,000-\$100,000	\$50,000-74,999

* The ACS income ranges are more granular than this survey's income ranges.

Table 7 reveals that overall survey respondents are similar to the state of Illinois' general population in terms of the age of homes, however we do not have AIC specific customer data. On the other hand, PY8 survey respondents are more likely to live in a single family home and are more likely to own their home relative to the general population of Illinois reported by the ACS. The annual household pre-tax income range for PY8 is \$25,000 to \$50,000, compared to the PY7 range of \$50,000 to \$100,000 and the general Illinois population range of \$50,000 to \$74,999.

Appendix A. PY8 General Population (Nonparticipant) Survey Instrument

Notes for Survey

Interviewer instructions are in green.

CATI programming instructions are in red.

(Items that should not be read are in parenthesis.)

Audience: This survey is for AIC customers who have not participated in a rebate program in PY8, PY7, and PY6.

Target: 350 completes (Note: Respondents that are terminated in questions A2 or A3 do not count towards the completion target because they are not part of the general population, they are considered participants)

Interim deliverables: At the end of each week of fielding, ODC will send Cadmus complete results for customers who provided a response to A28.

[Variables from sample]

Name

Address

Phone

Introduction and screening

- A1. Hello, I'm **[INSERT FIRST NAME]** calling from Opinion Dynamics on behalf of Ameren Illinois. We are conducting a survey about how households use and conserve energy. This is not a sales call. May I please speak with the person who pays the energy bill or head of the household? **[IF NEEDED: I'm not selling anything; we are only interested in your opinions to understand how to assist customers in saving money on their utility bills. Your responses will remain confidential. We are a third party research firm hired by Ameren Illinois to complete this research.]**
1. (Yes)
 2. (No) **[ASK TO SPEAK WITH PERSON WHO MAKE DECISIONS ABOUT ENERGY USE]**
 98. (Don't know) **[ASK TO SPEAK WITH PERSON WHO MAKE DECISIONS ABOUT ENERGY USE]**
 99. (Refused) **[THANK AND TERMINATE]**

Back-up information, not to be programmed:

[If "No – Not a convenient time," ask if Respondent would like to arrange a more convenient time for us to call them back or if you can leave a message for that person.]

[IF RESPONDENT ASKS HOW LONG, SAY: "APPROXIMATELY 10 MINUTES."]

[Only if asked for an AIC contact to verify the survey authenticity, offer Sharon Ruhland, who can be reached at 309.677.5192]

First, I have some questions about your familiarity with Ameren Illinois' energy efficiency programs.

- A2. In the past three years, did your household receive a rebate or discount from Ameren Illinois for installing energy-efficient equipment or improvements?
1. (Yes) [THANK AND TERMINATE]
 2. (No)
98. (Don't know)
99. (Refused)
- A3. Ameren Illinois customers are also eligible to receive customized Home Energy Reports that contain tips for reducing energy consumption and comparisons of your household's energy usage to similar homes in your area. Do you recall receiving one of these reports in the mail, by e-mail, or by logging into an online portal within the last three years?
1. (Yes) [THANK AND TERMINATE]
 2. (No)
98. (Don't know)
99. (Refused)

Awareness and NPSO

- A4. Before today, were you aware that Ameren Illinois offers rebates and discounts for energy-saving equipment and home improvements? [IF NEEDED: This program is called "Act on Energy"]
1. Yes
 2. No [SKIP TO A11]
98. DON'T KNOW [DO NOT READ] [SKIP TO A11]
99. REFUSED [DO NOT READ] [SKIP TO A11]
- A5. What rebates or discounts have you heard about? [DO NOT READ RESPONSES; ACCEPT MULTIPLE RESPONSES]
1. Air conditioner/heat pump (HVAC) discounts
 2. Refrigerator/freezer recycling
 3. Insulation incentives
 4. ENERGY STAR new homes
 5. Programmable thermostat rebate
 6. Discounted CFLs and LEDs/lighting
 7. Water heater rebates
 8. Home Efficiency Program (home energy audits)
 9. Other [SPECIFY: _____]
98. (Don't know)
99. (Refused)

- A6. Where did you hear or read about Ameren Illinois' energy efficiency rebate opportunities? [DO NOT READ RESPONSES; ACCEPT MULTIPLE RESPONSES]
1. Bill Insert
 2. Family/friends/word-of-mouth
 3. Act on Energy or Ameren Illinois website
 4. TV or Radio Ad
 5. Contractor
 6. Other [SPECIFY: _____]
 98. (Don't know)
 99. (Refused)
- A7. In the past year, did anyone in your household install any energy-efficient equipment or improvements that did not receive a rebate from Ameren Illinois?
1. (Yes)
 2. (No) [SKIP TO A11]
 98. (Don't know) [SKIP TO A11]
 99. (Refused) [SKIP TO A11]
- A8. What energy-efficient equipment did you install or improvements did you make? [PROMPT IF NEEDED; ACCEPT MULTIPLE RESPONSES]
1. CFL/LED Lighting
 2. Removed extra refrigerator or freezer
 3. Water heater [RECORD Type: GAS TANKLESS, GAS STORAGE, HEAT PUMP WATER HEATER]
 4. Central air conditioner
 5. Air Source Heat Pump or Efficient Electric Furnace
 6. Gas Furnace
 7. Ductless mini-split heat pump or mini-split
 8. Ground Source Heat pump or Geothermal heat pump or water-source heat pump
 9. Other [SPECIFY PRODUCT AND FUEL _____]
 98. (Don't know) [SKIP TO A11]
 99. (Refused) [SKIP TO A11]
- A9. [IF YES TO A8= 3 - 9] How do you know that this equipment is energy-efficient? [DO NOT READ. CHOOSE ALL THAT APPLY]
1. (ENERGY STAR label)
 2. (The retailer/dealer/contractor told me it was)
 3. (Product label said it was efficient)
 4. (Other) [SPECIFY: _____]
 98. (Don't know)
 99. (Refused)
- A10. Was this/Were these [RESPONSE TO A8] installed at a location served by Ameren Illinois?
1. Yes
 2. No
 98. (Don't Know)
 99. (Refused)

Energy Efficiency Awareness and Attitudes

Now I have a few questions about energy use in your household.

- A11. What, if any, actions do you currently take to save energy in your home? [PROMPT IF NEEDED; ACCEPT MULTIPLE RESPONSES]
1. Use programmable thermostat
 2. Use energy-efficient light bulbs
 3. Turn off lights and appliances when leaving a room
 4. (Other, [SPECIFY: _____])
98. (Don't Know)
99. (Refused)
- A12. How energy-efficient would you say your home is currently? Would you say...
1. Very inefficient
 2. Somewhat inefficient
 3. Somewhat efficient
 4. Very efficient
98. (Don't know) [SKIP TO A14]
99. (Refused) [SKIP TO A14]
- A13. What makes your home [A12 RESPONSE] [DO NOT READ; MARK ALL THAT APPLY]?
1. Older home
 2. Newer home
 3. Inefficient/older appliances
 4. Efficient/newer appliances
 5. Lacks insulation
 6. Has insulation
 7. Drafty/leaky
 8. Old HVAC system
 9. New HVAC system
 10. Efficient lighting (CFL/LED)
 11. Inefficient lighting
 12. Other [RECORD ANSWER]
98. (Don't know)
99. (Refused)
- A14. What is the primary fuel used to heat your home?
1. (Gas)
 2. (Electric)
 3. (Propane)
 4. (Fuel oil)
 5. (Other) [RECORD RESPONSE]
98. (Don't know)
99. (Refused)
- A15. What fuel type does your water heater use?
1. (Gas)
 2. (Electric)

3. (Propane)
4. (Fuel oil)
5. (Other) [RECORD RESPONSE]
98. (Don't know)
99. (Refused)

A16. What is the best way for Ameren Illinois to provide you with information about energy-efficiency programs and rebates? [PROMPT IF NEEDED; ACCEPT MULTIPLE RESPONSES]

1. E-mail from Ameren Illinois
2. Act on Energy website
3. Bill Insert
4. Telephone call
5. (Other) [SPECIFY: _____]
98. (Don't know)
99. (Refused)

A17. How important is saving energy in your home? Would you say...

1. Very important
2. Moderately important
3. Slightly important
4. Not at all important
98. Don't know [DO NOT READ]
99. Refused [DO NOT READ]

A18. What challenges, if any, do you face in saving energy in your home? [DO NOT READ LIST, ALLOW MULTIPLE RESPONSES]

1. (Can't afford it/too expensive)
2. (Too hard to install/implement)
3. (Inconvenient/don't have time/too busy)
4. (Not confident it will save energy/be worth it)
5. (Afraid it will make home uncomfortable)
6. (Disruption to home/mess involved with installing improvements)
7. (Challenges with contractors)
8. (No Challenges/None)
9. (Challenges with home construction or age)
10. (Homes are already pretty efficient)
11. (Other [SPECIFY: _____])
98. (Don't know)
99. (Refused)

A19. On a scale from 0-10, where zero is not at all knowledgeable and 10 is extremely knowledgeable, how would you rate your understanding of ways to make your home more energy-efficient?

1. [RECORD ANSWER: _____]
98. (Don't know)
99. (Refused)

Satisfaction

- A20. Taking into consideration all aspects of your utility service experience, how would you rate your satisfaction with Ameren Illinois overall? Use a 0 to 10 scale where 0 means not at all satisfied and 10 means extremely satisfied. [RECORD 0 – 10; 98. (DON'T KNOW); 99. (REFUSED)]
1. [RECORD AN ANSWER FROM 0-10: _____]
 98. (Don't know)
 99. (Refused)
- A21. [ASK IF ANSWER FROM A20≤7] Please say more about why you gave this rating?
1. [RECORD ANSWER: _____]
 98. (Don't know)
 99. (Refused)

Demographics

We are almost finished. I have a few final questions about your household. The answers to these questions will be kept confidential and will not be associated with you or your household.

- A22. Which of the following best describes the type of residence you live in? [READ LIST AND RECORD ONE RESPONSE]
1. Detached single-family home
 2. Townhouse or duplex which share adjacent walls
 3. Apartment or condo in a building with 4 or less units
 4. Apartment or condo in a building with 5 or more units
 5. Mobile or manufactured home
 6. (Other, [SPECIFY: _____])
 98. (Don't know)
 99. (Refused)
- A23. Do you own or rent your home?
1. (Own)
 2. (Rent)
 98. (Don't know)
 99. (Refused)
- A24. When was your home built?
1. [RECORD NUMERIC ANSWER]
 98. (Don't know)
 99. (Refused)
- A25. Including yourself, how many people live in your home on a full-time basis?
1. [RECORD ANSWER: _____]
 98. (Don't know)
 99. (Refused)
- A26. What is the approximate square footage of your home? [READ RESPONSE CHOICES IF NECESSARY]
1. (Less than 1,000 sq. ft.)
 2. (1,000 to 1,499 sq. ft.)
 3. (1,500 to 1,999 sq. ft.)

4. (2,000 to 2,499 sq. ft.)
5. (2,500 to 2,999 sq. ft.)
6. (3,000 sq. ft. or larger)
98. (Don't know)
99. (Refused)

A27. Which of the following categories best describes your total annual household income before taxes? Stop me when I get to the right category.

1. Less than \$25,000
2. \$25,000 to \$50,000
3. More than \$50,000 up to \$100,000
4. More than \$100,000 up to \$200,000
5. More than \$200,000
98. (Don't know)
99. (Refused)

A28. **[IF YES TO A8= 2- 9 AND A10=1]** We would like to know more about the energy efficiency improvement you made in the past year. You will receive a \$50 gift card for participating in a follow-up call. What is the best time during the week to reach you?

1. **[SPECIFY: CONTACT NAME, NUMBER, AND TIME TO CALL]**
98. (Don't know)
99. (Refused)

Closing

Thanks for your time. Have a good day!

Appendix B. Nonparticipant Survey – Cadmus Follow Up

Context: ODC will conduct a general population (nonparticipant) survey with Ameren Illinois customers to identify potential non-participant spillover (NPSO) behavior. At the close of each week of fielding, ODC will send Cadmus the results for any customers who report being aware of Ameren Illinois’ (AIC) energy efficiency programs and installing energy-efficient measures on their own (with no AIC rebate or incentive) in the past year. We will receive:

- Name, address, phone
- List of energy-efficient measure(s) they installed in the past year
- How customer knows the measure is energy-efficient
- Whether measure is installed at a location served by AIC
- Space heating fuel
- Water heating fuel
- Residence type, age, occupancy, square footage
- Best time for a follow up call

Cadmus will follow up with these customers directly to determine attribution (per NPSO protocol in the Illinois TRM Version 5.0 [Volume 4]) and energy savings. We will send customers a \$50 gift card to customers for participating in the follow-up call.

Step 1: Cadmus interviewers will prepare for the follow-up call. Review the Illinois TRM Version 5.0 (per the PY8 Evaluation Plan) to determine what information is needed about the reported measure(s) to calculate savings. For each customer, write down a list of missing information. If customer responded “don’t know” to the question about how they know the equipment is energy-efficient, ask questions to get at the efficiency level.

Step 2: Conduct the follow-up call. Follow this script:

Hello, may I speak with [contact name]? I am calling from Cadmus, an energy services firm hired by Ameren Illinois. You recently took a survey about how households use energy and agreed to participate in a follow-up call about energy saving upgrades you made to your home in the past year. You will receive a \$50 gift card for your time, may I confirm the mailing address I have on file is correct? [CONFIRM MAILING ADDRESS]

Thanks. First I would like to discuss how you decided to install the [MEASURE(S)].

- A1. When you were deciding to install the [MEASURE] did you consider: [RANDOMIZE AND READ LIST, RECORD YES/NO FOR EACH ITEM]
1. Information from a contractor or retailer talking about Ameren Illinois’ energy efficiency programs?
 2. Information that Ameren Illinois provided through a bill insert or online about saving energy?
 3. Information from a friend or family member who participated in Ameren Illinois’ efficiency program?
 4. Personal experience participating in an Ameren Illinois energy efficiency program in the past?

[IF THE CUSTOMER SAYS NO TO ALL, THANK AND TERMINATE]

A2. [FOR EACH YES RESPONSE FROM A1] On a 0 -10 scale, with 0 being not at all important and 10 being extremely important, how important was [YES RESPONSE TO A1] in your decision to install the [MEASURE]?

1. [RECORD ANSWER FROM 0-10: _____]
98. (Don't Know)
99. (Refused)

[IF THE CUSTOMER SAYS 0 FOR ALL RESPONSES TO THIS QUESTION, THANK AND TERMINATE]

A3. If you did not have the [RESPONSE(S) TO A1], how likely is it that you would still have installed the [MEASURE]? Please use a 0 to 10 scale where 0 means you definitely WOULD NOT have made the installation and 10 means you definitely WOULD have made the installation without the information from [RESPONSE(S) TO A1].

1. [RECORD ANSWER FROM 0-10: _____]
98. (Don't Know)
99. (Refused)

Next, I have some questions about what you installed. [CONFIRM MEASURE IS WHAT WE THOUGHT IT WAS, THEN GET INFORMATION (E.G., SAVINGS INPUTS) IDENTIFIED IN STEP 1]

Step 3: Calculate NPSO Savings

Calculate the spillover score: [(Maximum of response to A2) + (10 - response to A3)]/2

If the Spillover Score is >7.0, then calculate savings per the TRM 5.0, Volume 4.0
http://www.ilsag.info/il_trm_version_5.html

Use one Excel workbook to calculate all NPSO savings.