# IMPACT AND PROCESS EVALUATION OF THE 2012 (PY5) AMEREN ILLINOIS COMPANY COMMERCIAL AND INDUSTRIAL CUSTOM ENERGY EFFICIENCY PROGRAM

## Final

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# 1. EXECUTIVE SUMMARY

This report presents results from the evaluation of the fifth program year of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Custom Program for electric and gas energy efficiency. In Program Year 5 (PY5) (June 1, 2012 through May 31, 2013), AIC expected the Custom Program to account for 25% of the overall portfolio electric savings and 6% of the overall portfolio therm savings.[1]

The PY5 evaluation of the Custom Program involved both impact and process assessments. To support the evaluation we conducted research including a review of program materials and program-tracking data, interviews with program administrators and implementation staff, interviews with Staffing Grant recipients, and site visits to assess gross impacts. Our quantitative research efforts included a survey with Custom participants, as well as a non-participant survey to explore process-related issues and non-participant spillover.[2]

Below we present the key findings from the PY5 evaluation.

## Impact Results

Overall, the PY5 Custom Program performed well and exceeded internal net savings targets. As shown in Table 1 below, the program achieved 51,674 MWh in net electric savings and 729,439 therms in net gas savings. In addition, net realization rates are generally high.

**Table 1. C&I Custom Program Net Impacts**

| Program | *Ex Ante* Net Impacts | | | Ex Post Net Impacts | | |
|---|---|---|---|---|---|---|
| | MW | MWh | Therms | MW | MWh | Therms |
| Custom | 18 | 55,782 | 750,629 | 14 | 51,674 | 729,439 |
| *Net Realization Rate* | | | | *0.76* | *0.93* | *0.97* |

In general, the PY5 results are based on the team's application of the PY3 Net-To-Gross Ratio (NTGR) for Custom projects. The exception is the development and application of NTGRs for the eight staffing grant participants interviewed as part of the evaluation. The team applied their individual NTGRs on a retrospective basis and the results for these participants had a positive impact on the program.

## Process Results

Overall, the Custom Program approved 172 unique projects in PY5 containing a mix of different measure types, including refrigeration, miscellaneous, and lighting end-uses. This level of activity represents an increase over PY4 in which the program completed 103 projects. In addition, our review of program processes and implementation revealed that PY5 was another strong year for

[1] Planned portfolio level savings estimates are based on the AIC Plan 2 Filing (September 20, 2011). In addition, the percentages presented here include savings for Non-Residential New Construction, which is tracked as part of the C&I Custom Program.

[2] The non-participant survey was conducted in conjunction with the C&I Standard Program.

the Custom Program. In particular, program satisfaction continues to be high and participants overwhelmingly consider AIC a resource for information on energy efficiency. This positive relationship between the company and its participating customers is likely one reason why over 90% of participants plan to take part in the program again.

However, findings from the C&I non-participant survey indicate that the program faces challenges in reaching potential participants. For example, survey results show that only about 40% of non-participants are aware of AIC's ActOnEnergy Business Program and among that group, less than 10% consider themselves very familiar with the program. As a result, the program will need to develop new strategies in the coming years to increase awareness of the program.

In terms of program design, throughout PY5, the program implementation team made a number of modifications to the program to help improve the customer and program ally experience. These include changes to the program ally bonus structure which encouraged earlier completion of Custom and other C&I projects. Additionally, program staff updated their Quality Assurance and Quality Control (QA/QC) processes in an effort to ensure that a wider range of projects are inspected. Across the C&I portfolio, program staff also worked to enhance program applications.

Based on the evaluation team's PY5 evaluation activities, we make the following recommendations for the program going forward:

- **Repeat Participation**: Customers that participated in the Custom Program prior to PY5 contributed a significant portion of the electric and gas savings during this program year. High levels of customer satisfaction with the program, as well as AIC are a likely reason for the level of repeat participation, which presents an opportunity for the program in terms of marketing and outreach. In particular, given that almost a quarter of participants (22%) reported learning about the program from another company (15%) or through word of mouth (7%) having past participants speak about their experiences at events or continue highlighting them through case studies may prove to be an effective way to engage non-participants.

- **Reaching Non-Participants**. One of the potential barriers to participation among non-participants with some knowledge of the program is their perception that the equipment they need will not qualify for incentives. In order to better understand the basis for this belief, the program may want to consider conducting focus groups or other qualitative research with non-participating customers to understand whether this barrier is based on a lack of knowledge about the program or gaps in program offerings. These data collection efforts could also provide an opportunity for message testing or the assessment of marketing collateral, which may help to capture the attention of non-participating customers more generally.

- **Internet Marketing.** The program chose to actively utilize the Internet as a key marketing channel in PY5. As part of this effort, program staff used email, web analytics, search engine marketing, and online advertising to draw attention to the program. The evaluation team recommends the continued use of these tactics. Further, making use of the tracking capabilities will help to assess customer exposure to program messages, as well as the degree to which Internet marketing succeeds in bringing customers to the ActOnEnergy website.

# 2. INTRODUCTION

This report presents results from the evaluation of the fifth program year (PY5) of the AIC C&I Custom Program. The Custom Program is one of three programs within the AIC Commercial and Industrial (C&I) portfolio, which also includes the Standard and Retro-Commissioning programs.

To support the evaluation we conducted research, including a review of program materials and program-tracking data; interviews with program administrators and implementation staff; interviews with Staffing Grant recipients; and site visits to determine gross impacts. Our quantitative research efforts included a telephone survey of those who participated in the Custom Program, as well as a non-participant survey.

## 2.1 PROGRAM DESCRIPTION

The C&I Custom Program allows AIC business customers to complete energy efficiency projects that involve the installation of equipment not covered through the Standard Program. In general, Custom incentives are available for lighting, HVAC, refrigeration, and motors. Participants can also implement projects involving steam system upgrades, compressed air, drives, energy management systems, and industrial process measures. Beginning in PY4, AIC business customers could also install gas measures through the program. Key gas measures include heat recovery, building shell, and process heat and steam system upgrades.

AIC has also continued to offer the Staffing Grant initiative, the Competitive Large Incentive Project (CLIP), and incentives to offset costs of Feasibility Studies.

- The Staffing Grant offering, launched in PY4, provides customers with funding to help address energy efficiency project staffing needs. Funds are distributed based on the proportion of proposed savings ultimately achieved by the grant recipients.

- The CLIP offers the opportunity for customers to request the amount of incentive needed to complete their energy efficiency project(s). There is no minimum payback required, and multiple technologies (such as lighting, variable-frequency drives (VFDs), compressed air, HVAC, and process improvements) are included.

- The Feasibility Study offering, launched in PY4, is designed to help participants define project costs and energy savings opportunities, primarily targeting manufacturing/industrial facilities with compressed air systems. Incentives cover up to 50% of the study cost. Program staff indicate that although the incentive cap was raised in PY5 to $10,000 or 25% of estimated savings (up from 10%), there has not been as much demand as expected.

Consistent with prior years, the PY5 Custom Program also serves as a channel for the submission of New Construction Program projects.

## 2.2 RESEARCH OBJECTIVES

The objective of the PY5 Custom Program evaluation is to provide estimates of gross and net electric and gas savings associated with the program. In addition, we assessed the performance of newly implemented initiatives and promotional efforts designed to improve the participation process and the ability of customers facing resource constraints to participate in the program.

The PY5 impact evaluation answers the following questions:

1. What are the gross energy and demand impacts from this program?
2. What are the net energy and demand impacts from this program?
3. Did the program meet its energy goals? If not, why not?

The evaluation team also explored a number of process-related research questions as part of the PY5 evaluation.

1. Program Participation
    a. What does customer participation look like? How many projects were completed? By how many different customers? What type of projects?
    b. Does customer participation meet expectations? If not, how is it different from expectations and why?
    c. Does program ally participation meet expectations? How many market actors have joined the Program Ally Network?
2. Program Design and Implementation
    a. How and why has the program changed since PY4? Have these changes had their intended effect?
    b. What barriers to participation exist and how is the program seeking to overcome them?
3. Participant Experience and Satisfaction
    a. How do internal company approval processes affect participation in the Custom Program?
    b. How satisfied are customers with changes to the application form and submission process? Have changes made the participation process easier for them?
    c. Do participants see AIC as a key “energy advisor” and resource for energy saving information?
4. Opportunities for Program Improvement
    a. What aspects of program design or implementation could AIC change to improve program effectiveness and participant satisfaction?

# 3. EVALUATION METHODS

## 3.1 DATA SOURCES AND ANALYTICAL METHODS

The assessment of the fifth program year (PY5) of the AIC C&I Custom Program included both process and impact analyses. In addition, the evaluation team gathered data to update the net-to-gross ratio (NTGR) for the program for application in PY7. For PY5, the team applied the NTGR from PY3, given that the program's implementation has remained relatively consistent.

**Table 2. Summary of Evaluation Methods**

| Activity | PY5 Impact | PY5 Process | Forward Looking | Details |
|---|---|---|---|---|
| Program Staff In-Depth Interviews* | | √ | | Provides insight into program design, processes, and changes since PY4 |
| Participant Survey | | √ | √ | Gathers data to assess program processes and NTGR for PY7 |
| Staffing Grant Interviews | √ | √ | | Gathers data to support the development of NTGRs for these participants (the team applied these NTGRs retrospectively) |
| Non-Participant Survey* | | √ | √ | Gathers data to assess non-participant spillover, as well as potential barriers to participation |
| On-Site Visits | √ | | | Data collection to inform participant verification and gross impacts |

*Conducted in conjunction with the Standard Program.

### 3.1.1 PROCESS ANALYSIS

The process analysis used data from three data collection methods: in-depth interviews, quantitative telephone surveys with participants and non-participants, and a review of program implementation materials. In-depth interviews provided the team with a comprehensive understanding of changes in program design and implementation between PY4 and PY5. We conducted these interviews in conjunction with the Standard Program evaluation, and spoke with three program managers, the database manager, and the marketing team lead.

The evaluation team used the PY5 participant telephone survey to gather information about participants' experiences with the program, as well as NTGR (for future application). The non-participant survey focused on barriers to participation and non-participant spillover. In addition, the team attempted a census of Staffing Grant participants to gather NTGR-related information.

# 3.1.2 IMPACT ANALYSIS

## Gross Impacts

### *On-Site Audits*

The Custom component of the C&I Program used engineering review, engineering modeling, database and hardcopy verification, and on-site efforts to determine gross impacts. Overall, the evaluation team reviewed a total of 40 Custom Program projects. For the sample of sites, the team performed a desk review to compare the inputs provided in the application to the assumptions used in the analysis, verify consistency in savings estimates throughout the project file, and provide insight into the validity of the *ex ante* energy savings. The team accomplished this through the review of the submitted information and calculations for consistency, accuracy, and correct engineering principles.

Additionally, the team completed on-site visits and data logging at all 40 of the sites to provide increased accuracy in the gross impact results (19 sites used metered data collected through the installation of data loggers or collection of customer EMS data, while the remainder verified the operation of measures). There were a wide range of projects that fell into one of several categories: EMS/controls, lighting projects, compressed air systems, fan and pump projects, boiler or furnace systems, and miscellaneous.

The following sections provide additional details about the evaluation teams' methodology and assumptions by project category.

**EMS/Controls:** EMS/controls projects accounted for six of the 40 projects that were verified through on-site visits. Projects in this category involved the installation of energy management systems (EMS) or control systems to control the operation of heating, ventilation, and air conditioning (HVAC) equipment. Two of the projects verified included the installation or expansion of DDC control systems to control HVAC systems. Two projects involved upgrading the refrigerated case and lighting controls, one project upgraded the existing controls on a steam-to-hot-water heat exchanger, and one project involved upgrading chiller plant controls.

The evaluation team verified these projects through customer interviews and on-site visits. For HVAC control systems, the team determined the operation of the system through inspection of the control system and customer interviews. The set points of the control system were collected, and if available, trended data was taken from the control system or through the installation of metering equipment. The team compared the collected information to the information provided by the customer, as well as the information found in the project documentation describing the operation of the baseline system. The team performed the savings calculations using either a billed data regression analysis, or a customized energy model.

**Lighting**: Lighting projects accounted for three of the 40 projects that were verified through on-site visits. The lighting projects reviewed by the evaluation team involved efficient lighting systems for industrial buildings and storage space. Because all of the verified projects were retrofit projects, the team compared the proposed system to the existing system to determine the *ex post* savings.

If the details about the fixture and bulb type were unavailable, the team calculated the *ex post* savings using the wattages supplied by the customer, vendor, or typical fixture wattage values. The team considered the energy consumption of the ballast, as well as the bulb, and was able to measure the lamp wattage for two of the projects verified; the team used the manufacturer's specifications for the remaining lighting project.

The evaluation team verified the quantity of lights by inspection during the on-site visit, and also obtained the hours of operation from the customer during the visit. The team did not meter lighting systems that operated under fixed schedules, ran continuously all year, or were controlled via time clocks. The lighting system for one project operated under a sporadic schedule, and the lights were controlled via occupancy sensors. In this case, the team installed light on/off or light level loggers for a minimum of one week to monitor the hours of operation of the lighting system.

**Compressed Air Systems**: Compressed air projects accounted for nine of the 40 projects that were verified through on-site visits. The compressed air systems involved replacing older air compressors with newer variable-frequency drive (VFD) controlled compressors; installing efficient compressed air drying equipment; installing storage and regulators; installing sequencers; or removing an inefficient use of compressed air. The *ex post* savings compared the original system to the proposed system for all of the projects evaluated. The team obtained the details of the original and proposed systems from the documentation available, as well as information collected during the on-site visits. When possible (7 of 9 sites), they installed energy loggers on the air compressors to determine the typical and peak loading profiles.

All of the VFD compressor projects utilized the VFD compressor as a lag/trim compressor. VFD lag/trim compressors allow the system to modulate with the adjusting compressed air demand at the facility in the most efficient manner. The team used metered data from these installations to determine typical loading and peak load conditions. This information was compared to the baseline system as described by the customer and project documentation.

**Pumps/Fans:** The pump/fan projects accounted for six of the 40 projects that were verified. Projects in this category involved the modification of pump or fan systems to control flow and minimize energy use. Two projects involved the resheaving of fans or trimming of pump impellers. This allowed the fans and pumps to be more appropriately sized for the applications, minimizing system losses through throttling or excess flow. Two of the projects involved the removal of large industrial fans. Additionally, one project involved the installation of variable-frequency drives on a cooling water system, and one project involved adjusting the pumping pressure and number of pumps operating. The evaluation team conducted verification of these projects through customer interviews and on-site visits. During the on-site visit, the team verified the operation of the pumps or fans involved in the project. Additionally, the pump or fan energy usage was determined through metering or collecting EMS data. The team compared this to the expected operation of the system prior to the project completion.

**Boiler/Furnace:** The boiler and furnace projects accounted for nine of the 40 projects that were verified. Projects in this category involved the installation of efficient furnaces or boilers, the installation of a high-efficiency burner, or controls to improve the efficiency of the boiler. During the on-site visit, the evaluation team verified the installation of the efficient furnace, boiler, or burner. When possible, combustion efficiencies were verified with a stack-gas analyzer. For controls projects, the set points and operation of the boilers were verified though inspection and customer interviews. Additionally, when possible, the savings or the load profile on the furnace or boiler were verified by a billed data analysis.

**Miscellaneous:** The remaining seven projects were classified as “miscellaneous” or “other” projects. Many of these projects required project-specific calculations. Overall, the types of projects in this category are primarily industrial.

- One project was an electric arc furnace
- One project was a grain dryer

- One project was new elevator motors
- One project was variable-speed hydraulic pumps
- One project was upgrades at an ethanol plant
- One project was replacing steam traps
- One project was upgrades at a laundry facility

To adjust the ex ante gross energy and demand impacts for all 172 projects, the ratio adjustment method[3] was used. The team used the following ratio-adjustment algorithm.

**Figure 1. Ratio Adjustment Algorithm**

$$I_{EP} = \frac{I_{EPS}}{I_{EAS}} * I_{EA}$$

Where

$I_{EP}$ = the *ex post*[4] population energy and demand impacts
$I_{EA}$ = the *ex ante* population energy and demand impacts
$I_{EPS}$ = the *ex post* sample energy and demand impacts
$I_{EAS}$ = the *ex ante* sample energy and demand impacts

Based on the on-site sample, the evaluation team calculated the gross realization rate and applied this ratio ($\frac{I_{EPS}}{I_{EAS}}$) to adjust the ex ante energy and demand savings for the population of all 172 projects.

## Net Impacts

After gross impacts were estimated, the evaluation team generally derived net impacts by applying the PY3 NTGRs (0.75 for electric and 0.81 for gas). The electric value is based on self-reported information from a telephone survey that quantified the percentage of gross impacts for rebated project, as well as participant spillover. Information about the data collected to update the PY7 NTGR appears in Appendix B.

In addition, the team utilized findings from interviews with Staffing Grant participants to adjust a select number of Custom Program projects implemented by these participants. The following section outlines the methodology used to develop customer-specific NTGRs.

[3] Cochran, William G. (1977). Sampling Techniques. New York: John Wiley & Sons.

[4] *Ex post* refers to the estimated impact found by the evaluation team.

## Staffing Grant

The evaluation team took the following steps to arrive at an NTGR per participant that was applied to all of the projects that participants completed as a result of the grant.[5]

1. **Application Review**: The team reviewed project documentation, specifically the Staffing Grant application, to assess the stated need for staff resources in order to complete projects. This review served as background for interviews with participating customers.

2. **Interviews**: Analyst staff conducted participant interviews to estimate NTGR. The NTGR consists of two scores: Program Influence Component 1, and Program Influence Component 2. These components were determined as follows:

   - ***Program Influence—Component 1***: This freeridership score is based a single survey question (N6) that asks respondents to rate the importance of the Staffing Grant on their ability to implement the energy-saving projects completed at their facility. To convert this response into the Component 1 score (LI), the team used the following formula:

     $$LI = 1 - (N6 \times 0.1)$$

   - ***Program Influence—Component 2***: This freeridership score is based on two questions: 1) the likelihood that each project would have been completed without the Staffing Grant (N10), and 2) if the project would have been completed at the same time or later (N11). The team asked these two questions for each of the projects that the participant implemented as a result of the grant.

     The participant responses to N10 were converted into a value between 0 and 1 based on the following formula:

     $$QI = N10 \times 0.1$$

     In addition, the team assigned freeridership values between 0 and 1 for responses to N11 using the following formula:

     *IF N11="Never," T1=0*

     *IF N11="Same time," T1=1*

     *IF N11="Within 1 year," T1=0.66*

     *IF N11="Within 2-3 years," T1=0.33*

     As outlined above, each sub-component score (Quantity and Timing) can take on a value of 0 to 10, where a lower score means a lower level of free ridership. The overall Component 2 score for a participant is the average of the QI and TI scores.

     $$Component\ 2 = Average(QI, TI)$$

[5] Please note that not all of the projects completed by staffing grant recipients were submitted through the Custom Program. Similar adjustments were made within the Retro-Commissioning and Standard programs.

- ***Overall Free Ridership—Combination of Components 1 and 2***: To calculate an overall program influence score, the evaluation team averaged Component 1 and Component 2. The resulting free ridership factor for each participant thus ranges from 0 (no free ridership) to 1 (100% free ridership).

$$FR = Average\ (Component\ 1, Component\ 2)$$

- ***NTGR Score***: To develop the NTGR score, the team subtracted the FR score from 1 as shown below:

$$NTGR = 1 - FR$$

- ***Spillover***: The team also asked questions to gather information about potential spillover, which would be integrated with the NTGR score as NTGR = (1 - FR + SO). To determine the participant-level spillover factor, the team divided the estimated net savings of the measures installed outside of the program (but influenced by the program) by the gross savings the respondent realized through the program.

**Figure 2. Spillover Algorithm**

$$\text{Spillover} = \frac{Respondent\ Net\ Energy\ Savings\ from\ Measures\ Installed\ Outside\ the\ Program}{Respondent\ Gross\ Energy\ Savings\ from\ Measures\ Installed\ Through\ the\ Program}$$

3. **Consistency Check:** If the evaluation team encountered a situation in which the interview findings contradicted the data available in the application, they would have conducted additional analysis and considered an adjustment to the score resulting from the interview. In particular, two different analysts would have assessed the application and the interview data from a given participant and arrived at independent NTGRs. After a discussion of the values, the analysts would have reached agreement on the score for the participant. However, the team found that there were no cases in which the interview findings contradicted the data in the application.

4. **Final NTGR Determination**: As a final step in this process, the evaluation team compared the NTGR developed through the interview process above with the existing PY3 NTGRs for the various C&I programs.[6] The PY3 NTGRs were used as a floor and if the NTGR developed through the Staffing Grant interview exceeded the PY3 value, the team applied the new NTGR to all of the projects completed by that participant in PY5.[7] However, if the newly developed NTGR fell below the established PY3 value, the team applied the appropriate PY3 value to each of the participant's projects. This type of adjustment was made for four projects associated with two participating customers.

[6] Per the Illinois NTG Framework, the team generally applied PY3 NTGRs to determine PY5 net impacts.

[7] The team chose to establish a floor for two reasons: 1) Staffing Grant participants cannot be asked to speculate about the influence of the program and its incentive *if* they had a staff person to implement projects, and 2) it is reasonable to assume that the Staffing Grant participants are comparable to other AIC customers who went through the business programs via traditional channels, and therefore were selected for measure-specific NTGR survey batteries.

## 3.2 SAMPLING AND SURVEY COMPLETES

### 3.2.1 STAFFING GRANT INTERVIEWS

The evaluation team conducted in-depth NTGR interviews with Staffing Grant recipients during September and October 2013. These interviews focused on collecting data on free ridership and spillover, in addition to information about barriers to project completion. The team attempted a census of Staffing Grant participants, as shown in Table 3 below.

**Table 3. Completed Staffing Grant Interviews**

| Interviewees | Population | | Completed Interviews | |
|---|---|---|---|---|
| | Unique Customers | Associated Projects | Unique Customers | Associated Projects |
| Grant Recipients | 16 | 46 | 8 | 29 |

Overall, the team spoke with participants responsible for 81% of the kWh savings and 69% of the therm savings associated with projects implemented by Staffing Grant recipients. Given that a census attempt was made, there is no sampling error or precision estimate associated with the NTGR findings. In addition, it is important to note that the average NTGR resulting from these efforts was not extrapolated to the entire participant population.

### 3.2.2 CUSTOM PARTICIPANT SURVEY

The evaluation team fielded a CATI telephone survey with Custom Program participants in two waves. For the first wave, the team selected the sample of participant projects from data in the AIC tracking system extract from December 2012. For the second wave, the team selected the sample of participant projects from data in the AIC tracking system extract from July 2013.

The team attempted to complete a telephone survey with all decision-makers in the Custom Program that completed a project during PY5. Duplicate contact names were removed from the sample where a single person was involved in more than one project, as were contacts who completed a staffing grant project and would be called as part of that effort. In addition, participants were asked mainly about one project to reduce respondent burden, and that project discussed was randomly selected. However, the team also captured details related to the decision-making process for those participants with more than one project of the same type. Table 4 below presents the population values and completed survey information for the Custom Program.

**Table 4. Completed Custom Telephone Survey Points**

| Project Type | Sample Frame (Custom Only) | | | | Completed Surveys | | |
|---|---|---|---|---|---|---|---|
| | Projects [a] | Contacts | Ex Ante MWh Savings | Ex Ante Therm Savings | Contacts | Ex Ante MWh Savings | Ex Ante Therm Savings [b] |
| Lighting | 31 | 28 | 4,194 | – | 8 | 214 | – |
| HVAC | 14 | 12 | 487 | 159,139 | 5 | 304 | 83,876 |
| Compressed Air | 25 | 20 | 8,044 | – | 11 | 3,594 | |
| Refrigeration | 77 | 5 | 2,061 | – | 5 | 1,638 | – |

| Project Type | Sample Frame (Custom Only) | | | | Completed Surveys | | |
|---|---|---|---|---|---|---|---|
| | Projects [a] | Contacts | Ex Ante MWh | Ex Ante Therms | Contacts | Ex Ante MWh | Ex Ante Therms |
| Drives | 1 | 1 | 3 | – | – | – | – |
| Motors | 4 | 4 | 6,843 | – | 3 | 1,622 | – |
| Industrial Process | 8 | 6 | 5,193 | 80,782 | 4 | 4,260 | 32,354 |
| Miscellaneous | 7 | 6 | 207 | 22,014 | 5 | 207 | 21,138 |
| **Total** | **167** | **82** | **27,034** | **261,936** | **41** | **11,839** | **137,368** |

[a] The total number of projects listed reflects the population in AIB as of July 2013. This includes projects with a status of "check cut" or "check queued," but excludes Staffing Grant projects. As a result, the tally here does not match data provided elsewhere in the report on the total number of projects or measures.

[b] The gas savings presented here are associated with 8 project contacts.

As the evaluation team attempted to gather data from a census of the 82 unique program participants installing Custom measures. As a result, there is no sampling error associated with the NTGR, i.e., no confidence intervals can be calculated. As described in the next section, the team also assessed the potential for non-response bias. See Appendix B for information about the NTGR research.

For the process assessment, the evaluation team concluded that an un-weighted analysis for the Custom Program provided the best representation for process results, given that no sampling took place. The analysis largely features the reporting of response frequencies, and the team decided to give equal weight to each response.

## Survey Dispositions and Response Rate

Table 5 below shows the final survey dispositions of the telephone numbers in the Wave 1 and Wave 2 samples.

**Table 5. Custom Program Participant Survey Dispositions**

| Disposition | N |
|---|---|
| Completed Interviews (I) | 41 |
| *Partial* | 5 |
| Eligible Non-Interviews | 32 |
| *Refusals (R)* | 2 |
| *Telephone Answering Device (NC)* | 8 |
| *Mid-Interview Terminate (R)* | 3 |
| *Respondent Never Available (NC)* | 19 |
| Not Eligible (e) | 1 |
| *Wrong Number* | 1 |
| Unknown Eligibility Non-Interview (U) | 3 |
| *No Answer* | 3 |
| **Total Participants in Sample** | **82** |

Table 5 below provides the response and cooperation rates for both survey waves. The evaluation team calculated the survey response rate using the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR).[8]

**Table 5. Custom Program Survey Response and Cooperation Rates**

| AAPOR Rate | Percentage |
|---|---|
| Response Rate (RR3) | 50% |
| Cooperation Rate | 80% |

The team compared survey respondents with those who did not respond to the survey in order to assess the potential for non-response bias. In general, we found the potential for bias in NTG and process results as a result of the fact that survey respondents typically had lower savings on average than non-respondents. This has the potential to introduce bias as participants with greater savings may have different attribution, as well as program experiences.

### 3.2.3 NON-PARTICIPANT SURVEY

As noted in the Standard Program report, the evaluation team developed the non-participant survey sample based on a data file provided by AIC containing business customers from all rate classes that had never participated in the ActOnEnergy Business Program. From this data, the team developed two sample frames: one containing gas-only customers, and another containing electric-only and combination (gas and electric) customers. The sample frames included all unique commercial and industrial customers based on account number and telephone number. During preparation of the sample frames, the team removed any customers for which it did not have rate code information and therefore could not classify as gas-only, electric-only, or combination. In addition, the team chose to exclude customers in the DS4 and GS4 rate codes (large gas and electric accounts), given their small overall numbers in the population and low likelihood of being reached through the survey.

**Table 6. Non-Participant Sample Design**

| Sample Group | Customer Type | Sample Frame | Percent of Total |
|---|---|---|---|
| Gas | Gas-Only | 21,500 | 24% |
| Electric/Combo | Electric-Only | 93,729 | 59% |
| | Both | 37,908 | 13% |
| | Subtotal | 153,137 | 96% |
| Dropped | Missing Rate Code | 7,009 | 4% |
| **Total** | | **160,146** | **100%** |

The team used this two-frame approach in order to ensure sufficient coverage of gas customers and associated gas measures. From the two sample frames, a simple random sample was drawn. Table 7 below outlines the approach implemented for this survey.

[8] *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*, AAPOR, 2009. http://www.aapor.org/Standard_Definitions/2852.htm.

**Table 7. Completed Non-Participant Survey Points**

| Customer Type | Sample Frame | Initial Sample Selected for Interviewing | Completed Survey |
|---|---|---|---|
| Gas-Only | 21,500 | 2,200 | 73 |
| Electric/Combo | 131,637 | 5,500 | 178 |
| **Total** | **153,137** | **7,700** | **251** |

Since the respondents closely resembled the non-participant population in terms of customer type, the evaluation team concluded that the survey results did not need to be weighted.

Overall, the sample design provides statistically valid nonparticipant spillover results at the 90% confidence level, ±16% precision based on sampling. Note that nonparticipant spillover results were reported in the evaluation of the C&I Standard Program.

## Survey Dispositions and Response Rate

The evaluation team fielded the survey with non-participants from August 15 through August 29, 2013. Table 8 below provides the final survey dispositions.

**Table 8. Non-Participant Survey Dispositions**

| Disposition | N |
|---|---|
| Completed Interviews (I) | 251 |
| Eligible Non-Interviews | 2,725 |
| *Refusal (R)* | 1,031 |
| *Mid-Interview Terminate (R)* | 112 |
| *Respondent Never Available (NC)* | 856 |
| *Telephone Answering Device* | 714 |
| *Language Problem (NC)* | 12 |
| Not Eligible (e) | 2,061 |
| *Duplicate Number* | 3 |
| *Fax/Data Line* | 80 |
| *Non-Working* | 657 |
| *Wrong Number* | 175 |
| *Business/Government/Other Org.* | 233 |
| *No Eligible Respondent* | 913 |
| Unknown Eligibility Non-Interview (U) | 1,224 |
| *Not Dialed/Worked* | 694 |
| *No Answer* | 500 |
| *Call Blocking* | 11 |
| *Busy* | 19 |
| **Total Participants in Sample** | **6,261*** |

*Note: This number differs from that presented in Table 7, as not all pieces of the sample were ultimately loaded.

Table 9 below provides the response and cooperation rates. The team calculated the survey response rate using the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR).[9]

**Table 9. Non-Participant Survey Response and Cooperation Rates**

| AAPOR Rate | Percentage |
|---|---|
| Response Rate | 8% |
| Cooperation Rate | 18% |

### 3.2.4 ON-SITE VERIFICATION

Energy and demand impacts associated with the Custom Program were determined based on on-site audits and metering M&V, as well as detailed engineering desk review of completed projects discussed below. The sample of participant projects for these activities was selected from data in the AIC tracking system extract from July 2, 2013.

The evaluation team selected a sample of 40 projects for engineering review and metered site verification from the population of 172 completed projects in two waves. The electric sample was chosen using a stratified random sample design. For the stratification, the team used the Dalenius-Hodges method to determine strata boundaries based on ex ante kWh savings, and the Neyman allocation to determine the optimal allocation of the available interviews to the strata. Note that those projects that had both gas and electric savings (n=10) were included under the electric sample (the team selected four combination projects in total). However, the gas savings from these projects were added to the gas savings from the gas-only projects to determine the gas realization rate. The team conducted a census of gas only projects as shown below.

The team also drew the sample in two waves to ensure that a sufficient percentage of the savings from the program was assessed, and to allow the team to complete the M&V in time to meet reporting deadlines. Table 10 below shows the sample selected in both waves. Overall, the 40 sites with on-site verification account for 51% of the programs' *ex ante* kWh savings and 87% of the gas savings.[10]

[9] ***Ibid.***

[10] ***Ex ante*** savings are estimates of savings in the utility tracking system, or what the utility believed they had saved prior to the evaluation.

**Table 10. Two-Wave Custom Site Visit Sampling Approach**

| Sampling Strata | KWh Savings Range | Number of Projects[a] | Site Visit Sample | Site Visits Completed |
|---|---|---|---|---|
| Wave 1 | | | | |
| 1 | 6,000-100,000 | 44 | 2 | 2 |
| 2 | 100,001-900,000 | 13 | 8 | 8[b] |
| 3 | 900,001-6,000,000 | 5 | 5 | 5 |
| Wave 2 | | | | |
| 1 | 1,000-75,000 | 57 | 2 | 2[c] |
| 2 | 75,001-1,000,000 | 26 | 7 | 7 |
| 3 | 1,000,001-15,000,000 | 5 | 5 | 5 |
| Gas Only | | | | |
| Gas | N/A | 11 | 11 | 11 |
| **TOTAL** | | **161** | **40** | **40** |

[a] Given that the Wave 1 sample was selected prior to the finalization of AIB, the total number of projects does not match the final AIB extract, and the project counts presented elsewhere in the report.

[b] Three of these projects contained gas and electric savings.

[c] One of these projects contained gas and electric savings

The final sample design provides statistically valid impact results at the 90% confidence level ±8% precision on a kWh basis, ±11% precision on a kW basis, and ±10% precision on a therm basis for the Custom Program overall. The evaluation team calculated precision for the gross impact results by pooling the results from both waves of site visits.[11]

[11] These calculations were done per the California Evaluation Framework.

# 4. RESULTS AND FINDINGS

## 4.1 PROCESS FINDINGS

The evaluation team performed a targeted process evaluation of the PY5 AIC C&I Custom Program, focusing on program awareness, barriers to participation, and customer satisfaction with the processes in which they were involved. Results are based on in-depth interviews with program staff, a review of program documentation, and a telephone survey with Custom Program participants and non-participants.

### 4.1.1 PROGRAM DESCRIPTION AND PY5 PARTICIPATION

The C&I Custom Program allows AIC business customers to complete energy efficiency projects that involve the installation of equipment not covered through the Standard Program. In general, Custom incentives are available for lighting, HVAC, refrigeration, and motors. Participants can also implement projects involving steam system upgrades, compressed air, drives, energy management systems, and industrial process measures. Beginning in PY4, AIC business customers could also install gas measures through the program. Key gas measures include heat recovery, building shell, and process heat and steam system upgrades.

AIC has also continued to offer the Staffing Grant initiative, the Competitive Large Incentive Project (CLIP), and incentives to offset costs of Feasibility Studies.

- The Staffing Grant offering, launched in PY4, provides customers with funding to help address energy efficiency project staffing needs. Funds are distributed based on the proportion of proposed savings ultimately achieved by the grant recipients.
- The CLIP offers the opportunity for customers to request the amount of incentive needed to complete their energy efficiency project(s). There is no minimum payback required, and multiple technologies (such as lighting, variable-frequency drives (VFDs), compressed air, HVAC, and process improvements) are included.
- The Feasibility Study offering, launched in PY4, is designed to help participants define project costs and energy savings opportunities, primarily targeting manufacturing/industrial facilities with compressed air systems. Incentives cover up to 50% of the study cost. Program staff indicate that although the incentive cap was raised in PY5 to $10,000 or 25% of estimated savings (up from 10%), there has not been as much demand as expected.

Consistent with prior years, the PY5 Custom Program also serves as a channel for the submission of New Construction Program projects.

#### Program Participation

Overall, the Custom Program approved 172 unique projects, which involved the installation of 191 measures, as summarized in Table 11 below. More projects were completed in PY5 compared to PY4 (103 projects), and the PY5 Custom projects contained a mix of different measure types, with some of the more common coming from the refrigeration, miscellaneous, and lighting end-uses.

**Table 11. Summary of PY5 Custom Measure Types**

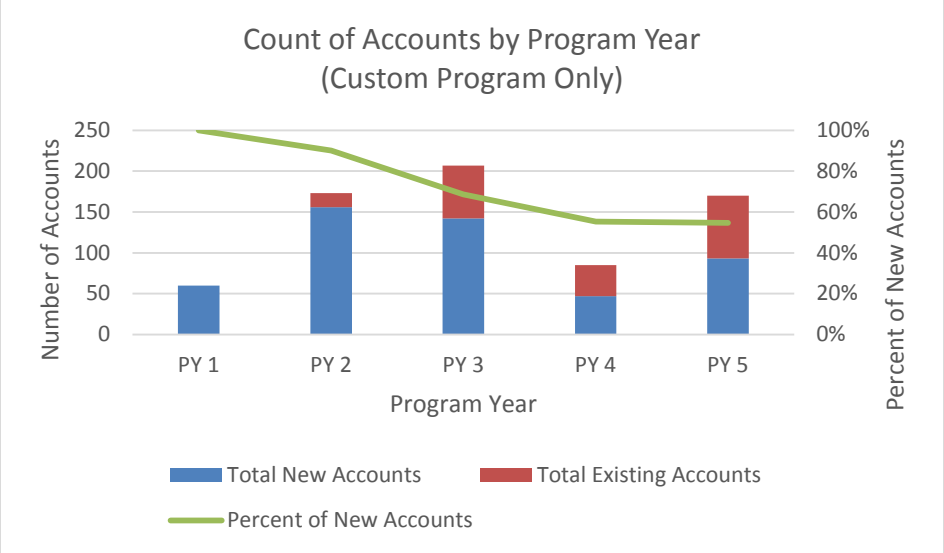
| End-Use | Electric Measures | | Gas Measures | |
|---|---|---|---|---|
| | # | % | # | % |
| Refrigeration | 45 | 26% | | |
| Lighting | 35 | 21% | | |
| Miscellaneous | 34 | 20% | 4 | 19% |
| Compressed Air | 28 | 16% | | |
| HVAC | 12 | 7% | 13 | 62% |
| Industrial Process | 11 | 6% | 4 | 19% |
| Motors | 4 | 2% | | |
| Drives | 1 | 1% | | |
| **Total** | **170** | **100%** | **21** | **100%** |

Source: Final AIB Data (September 4, 2013).

## Historical Participation

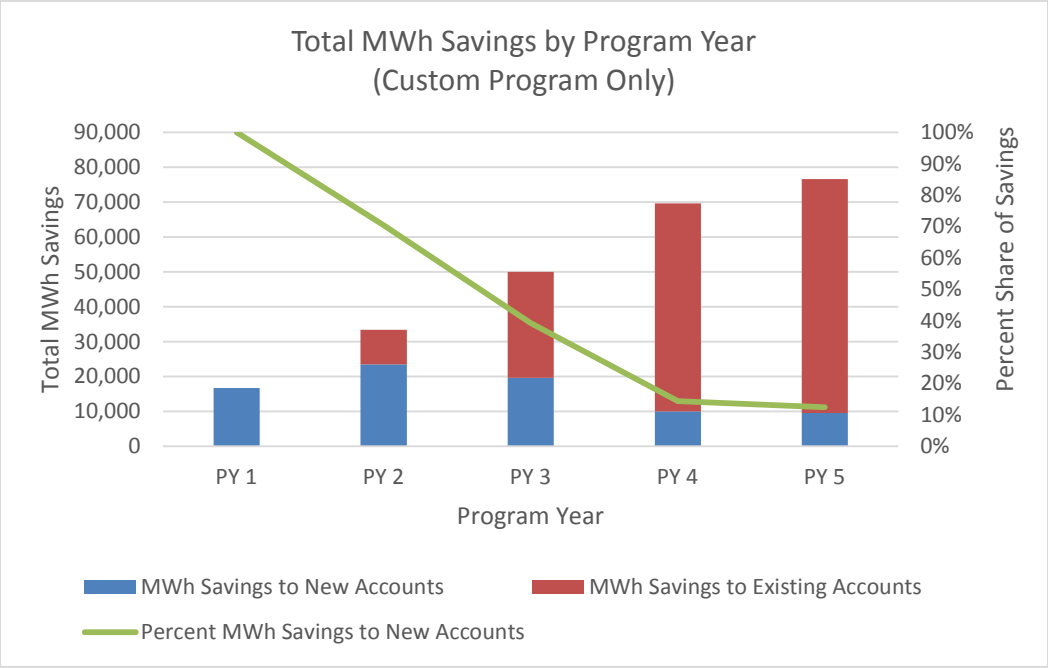
As part of the review of PY5 participation, the team also reviewed AIB data from PY1 through PY5 in order to identify trends in participation over time. As shown in Figure 3 below, there was a decline in the number of accounts participating in the Custom Program after PY3, but the program has seen an increase between PY4 and PY5. In addition, repeat participation (as show by the total existing accounts) is on the rise.

**Figure 3. Custom Program Participation by Account (PY1-PY5)**



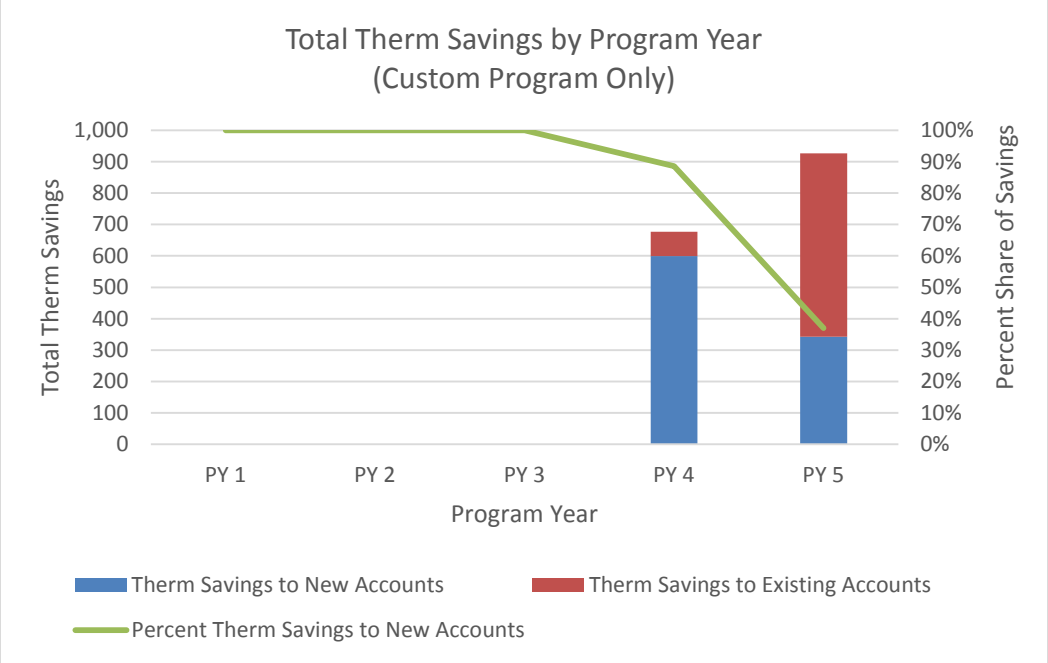

As shown in Figure 4 below, despite fluctuations in participation, total MWh savings from the Custom Program have consistently increased over time, with a large proportion coming from past participants.

**Figure 4. Custom Electric Savings by Program Year**




**A similar trend is evident when looking at gas savings, as shown in Figure 5 below, where gas savings are increasing year-over-year and a sizable percentage of savings come from past participants (i.e., existing accounts).**

**Figure 5. Custom Therm Savings by Program Year**



### *Staffing Grant*

In PY5, AIC ultimately awarded 21 Staffing Grants to 16 unique customer contacts. As shown in Table 12 below, these grants led to a combined total of 46 projects.

**Table 12. PY5 Staffing Grant Participation**

| Participation Details | Counts |
|---|---|
| Total Grants | 21 |
| Unique Customers | 16 |
| Associated Projects in PY5 | 46 |

## 4.1.2 PROGRAM DESIGN AND IMPLEMENTATION

AIC continues to modify the C&I Custom Program to overcome barriers to participation and create a seamless participation process for customers. Although there were a number of changes to the program in PY5, the Custom Program continued to function smoothly and effectively based on findings from both the participant survey and the interviews with program staff.

## Program Modifications

In general, the structure and delivery of the Custom Program remained consistent with PY4. However, key changes to program delivery are described below.

### Application Process

AIC and SAIC strive to continually update and improve the program application to make submissions as easy as possible for participants. In PY5, the Custom application process was streamlined through the implementation of PDF fillable application forms, which make many of the necessary calculations automatically, as well as check to ensure that all required fields are completed before submission. This change allows increased accuracy and reduces the need for follow-up interactions to complete forms.

In preparation for the implementation of a wider range of changes to the application process in PY6, the new online application process, AMPMagic, was also released as a beta test to select program allies in March 2013. AMPMagic allows for Statewide TRM-compliant Standard Lighting Program projects to be configured using an online estimator, and to be submitted directly online. Although few had used this tool before the end of PY5, the tool is expected to be used more frequently for both Custom and Standard projects in PY6.

Finally, the program adjusted a couple of specific PY5 application requirements. First, the required Custom application payback period was changed from seven to 10 years, allowing larger and more long-term projects. Second, the Large Incentive Request Form is now required only for projects over $25,000.

### Encouraging Earlier Project Completion

The program implemented a new bonus incentive structure for program allies, consisting of a percentage bonus and a threshold bonus. The former provided an 8% match of customer incentives for projects completed by the end of December 2012, and 2% for the months thereafter until the end of April 2013. The threshold bonus provides allies with $500 for every 250,000 kWh and $100 for every 2,000 therms (cumulative) for projects completed by the end of April 2013. These

changes were meant to encourage early completion of customer projects, as well as additional savings. In in-depth interviews, PAs indicated that this structure has been effective at encouraging early completion of customer projects, and has been well received by allies.

Another risk to program performance caused by late projects is the CLIP. Given that these projects tend to be so large, when they are not completed in a timely manner there can be significant drawbacks for the program. To prevent this, customers in PY5 received a conditional bonus of 15% if they could provide a letter of corporate commitment to the project timeline.

### Quality Assurance and Control

The program made changes to its inspection process in PY5 to ensure greater coverage of the contractors submitting work through the program. In particular, the geographic criteria were eliminated and all contractors were flagged for inspection after certain incentive thresholds were reached (i.e., incentives of $2,500, $25,000, $50,000, $100,000, and at $50,000 increments thereafter). This change ensures that the work of all contractors who significantly contribute to the program will be inspected periodically. Under the old structure, contractors who completed small projects could be inspected only once, even if they built up a significant level of program work over time.

### Eligible Measures and Incentive Levels

AIC and SAIC continued their practice of reviewing and modifying incentive levels and measure eligibility for the Custom Program to ensure it's operating at the highest standards. As a result, the PY5 incentive level for the electric Custom Program increased from$0.05/kWh for lighting measures and $0.07/kWh for all other measures to $0.06/kWh and $0.08/kWh, respectively. Additionally, the electric incentive cap of $600,000 per facility was removed, allowing a few larger customers to increase participation.

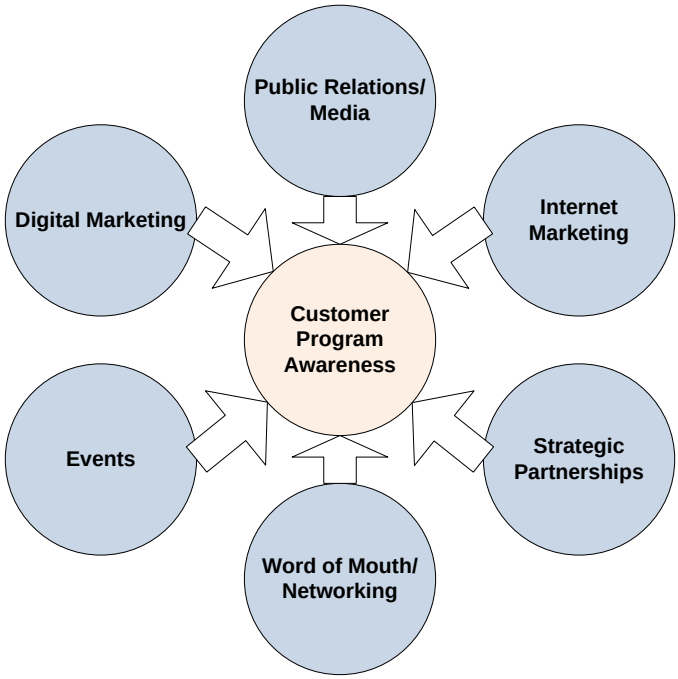
In addition, due to falling costs and increased demand for LED lighting, this measure was removed from the Custom Program and placed under the Standard Program.

## Marketing and Outreach

### *Overview of Marketing Strategy*

After focusing on building a strong marketing team in PY4, AIC and SAIC focused their marketing efforts in PY5 on expanding awareness of the program, trying to reach customers with measures relevant to their business needs, and communicating why customers should participate in the program. In general, the program implementation team identified six main marketing strategies for PY5, as shown in Figure 6 below.

**Figure 6. PY5 Communication Channels**




While the program leveraged each of these strategies, some played a more important role in PY5 than others. In particular, AIC used email, web analytics, search engine marketing (SEM), and online advertising as part of its Internet marketing efforts. In addition, program staff have made an effort to acquire and leverage customer email addresses through a variety of means, such as requesting an email address from customers who take advantage of free lighting kit offers. These efforts have expanded the circulation of AIC newsletters.

The ActOnEnergy website also serves as a powerful tool. Not only has AIC made an effort to drive traffic to the site using other marketing channels, but they also updated the website based on lessons learned from PY4 focus groups. Further, AIC has implemented analytics that allow the tracking of site metrics, as well as the tracking of individual customers through unique URLs in order to monitor the success of specific efforts.

Beyond Internet marketing, the implementation team utilizes a range of other tactics to reach AIC business customers.

- **Direct Marketing**: This marketing channel consists of print ads, direct mail and bill inserts, brochures, case studies, flyers, and branded materials. Use of this marketing channel was limited to specific audiences in PY5.

- **PR/Media**: Through press releases, media events, and "big-check" presentations, AIC has continued to widen program exposure through the public relations channel. By recognizing Most Progressive Cities within its service territory, AIC has also increased media attention on energy efficiency and the ActOnEnergy Program.

- **Events**: AIC continued to host a customer symposium, and offered attendees a 15% coupon for additional incentives. AIC also worked with a third party to collect interviews with a variety of stakeholders in order to inform planning for the symposium and other events. The symposium drew approximately 600 people, the largest attendance so far.

- **Strategic Partnerships**: In an effort to build relationships with various organizations and their members, there was an increase in sponsorships offered to professional associations in PY5. This is a targeted channel that helps to increase awareness of AIC and its offerings among specific targeted communities.

- **Word of Mouth/Networking**: This channel attempts to engage associations, community groups, and program allies to spread awareness. Community groups, such as chambers of commerce, act as targeted communication channels, especially for small businesses. In PY5, AIC continued to develop and strengthen these relationships, hosting "Lunch and Learn" events to increase program exposure among their members, and driving interest in the annual customer symposium.

## *Program Outreach*

### Overall Program Awareness in Non-Participants

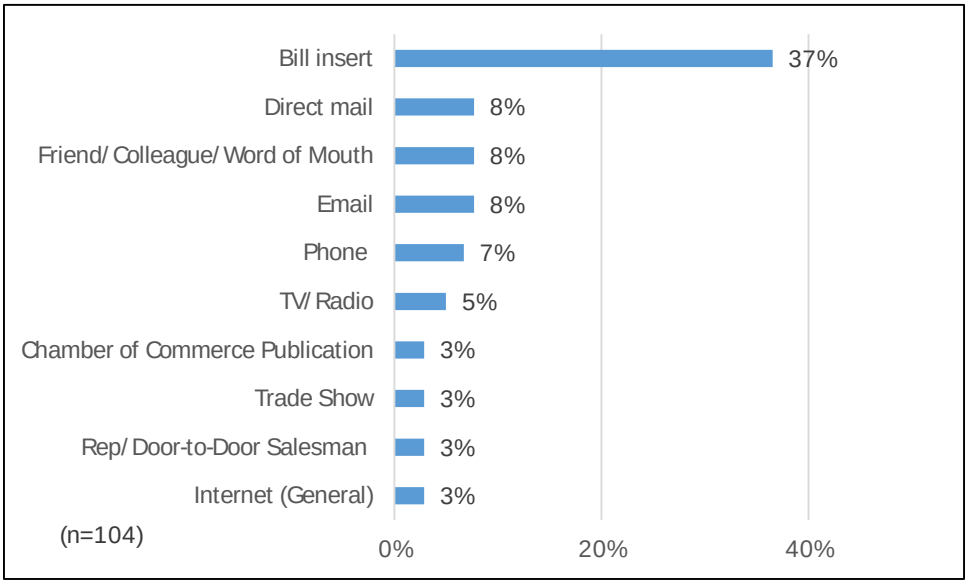
As reported in the C&I Standard report, the evaluation team found that non-participants had moderate levels of awareness of AIC-sponsored energy efficiency programs in general, but low awareness of the ActOnEnergy Business Program (35%) name. However, the percentage of respondents aware of the ActOnEnergy Business Program increased from 35% to 41% when the program was described to respondents.[12]

While awareness of the ActOnEnergy Business Program is moderate among non-participants, those aware of the program are not very familiar with the program details. While 6% of non-participants indicate that they are very familiar with the program, close to half (47%) of non-participants say they are somewhat familiar with the program. Based on these findings, it is clear that there is still room for increased program outreach to AIC's business customers.

In terms of reaching these potential participants with program information, bill inserts (37%) are the most commonly recalled source of information among those who are aware of the program, as shown in Figure 7 below. Among those who encountered program information through multiple channels, respondents cited direct mail materials (including direct mail flyers and bill inserts) as the method that was most effective at communicating information about the program (30%).

[12] The AIC ActOnEnergy Business Program offers incentives for energy-efficient equipment upgrades and improvements including lighting, cooling, refrigeration, and motors.

**Figure 7. Sources of Program Awareness among Non-Participants**




## Marketing Exposure in Participants

Custom participants report exposure to a variety of marketing and outreach efforts, as shown in Table 13 below. Relationships with vendors continue to drive customer awareness of the program; the largest portion of respondents (17%) stated that vendors, suppliers, or distributors were the first channel through which they had encountered the program. Word of mouth has also driven awareness, with 15% citing other companies as their initial exposure, and another 7% citing a friend or colleague. Email and the Internet are the third-most-common channel of initial program exposure (12%). This may be due to AIC's increased efforts to gain customer contacts for newsletter distribution.

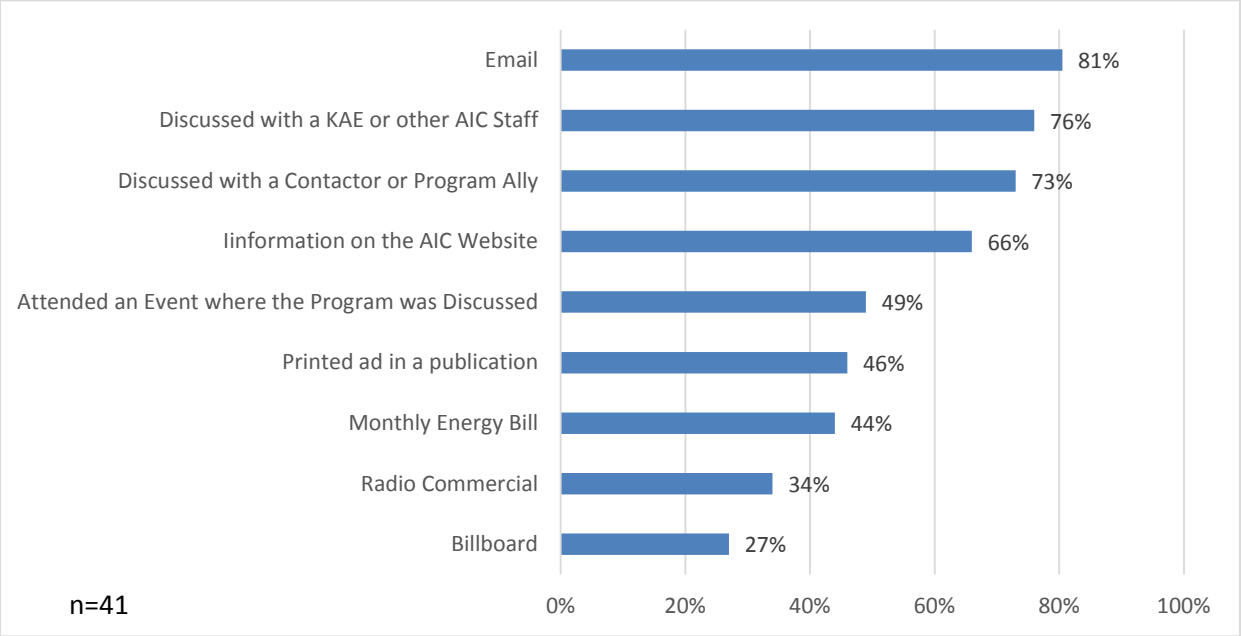
**Table 13. How Participants Heard About Program**

| Source of Information | Percent of Participants (n=41) |
|---|---|
| Vendor/Supplier/Distributor | 17% |
| Another Company – General | 15% |
| Email/Internet | 12% |
| Contractor/Program Ally | 9% |
| AIC Key Account Executive | 7% |
| Friend/Colleague/Word of Mouth | 7% |
| Bill Insert | 7% |
| Media – General | 7% |
| Consultant | 5% |
| Don't Know | 5% |

Note: Responses under 5% are not shown.

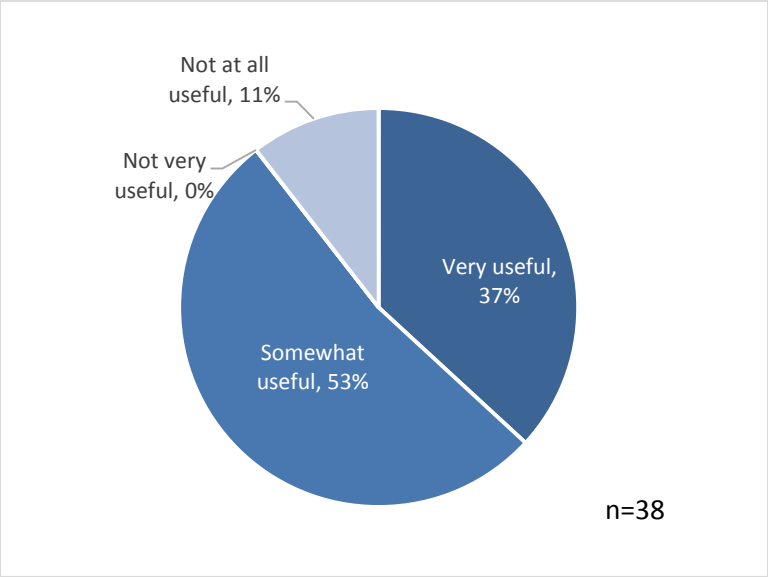
In order to assess exposure to some of the program's PY5 marketing efforts, the evaluation team also asked participants if they had ever encountered a specific set of marketing channels used by the program. As shown in Figure 8 below, the majority of participants were exposed to program messages through email, key account executives, contractors, and the program website. As expected, all of the self-described large businesses with whom the team spoke had discussed the program with AIC staff. Collectively, these findings illustrate the reach of AIC's PY5 marketing efforts, as well as the importance of personal relationships in building awareness of the program.

**Figure 8. Ways Participants Receive Program Information**




We also found that the marketing materials that are used to provide program information to customers are seen as useful. Almost all participants (90%) found the marketing materials to be at least "somewhat useful" (see Figure 9 below), while the only suggestion for improvement was to make the materials more detailed.

**Figure 9. Usefulness of Marketing Materials**




Note: The percentages are based on valid responses (i.e., they exclude respondents who said "Don't Know" and "Refused").

### AIC as a Resource for Information

In assessing program outreach efforts and customer interactions with AIC, the team explored the degree to which AIC is perceived as a resource for energy efficiency information. When asked unaided where they would look for information about energy efficiency, Table 13 shows that 24% said they would look to AIC. However, when those who did not mention AIC unaided were asked directly whether they consider AIC a resource for energy efficiency information, the percentage of participants who view AIC as a resource rose to 90%.

**Table 14. Sources of Information about Ways to Save Energy (Unaided)**

| Source | Percent of Participants (n=41) |
|---|---|
| Internet | 68% |
| **AIC** | **24%** |
| Other companies | 10% |
| Word of mouth | 2% |
| Past experience | 2% |

## 4.1.3 PARTICIPANT EXPERIENCE AND SATISFACTION

### Program Processes and Effectiveness

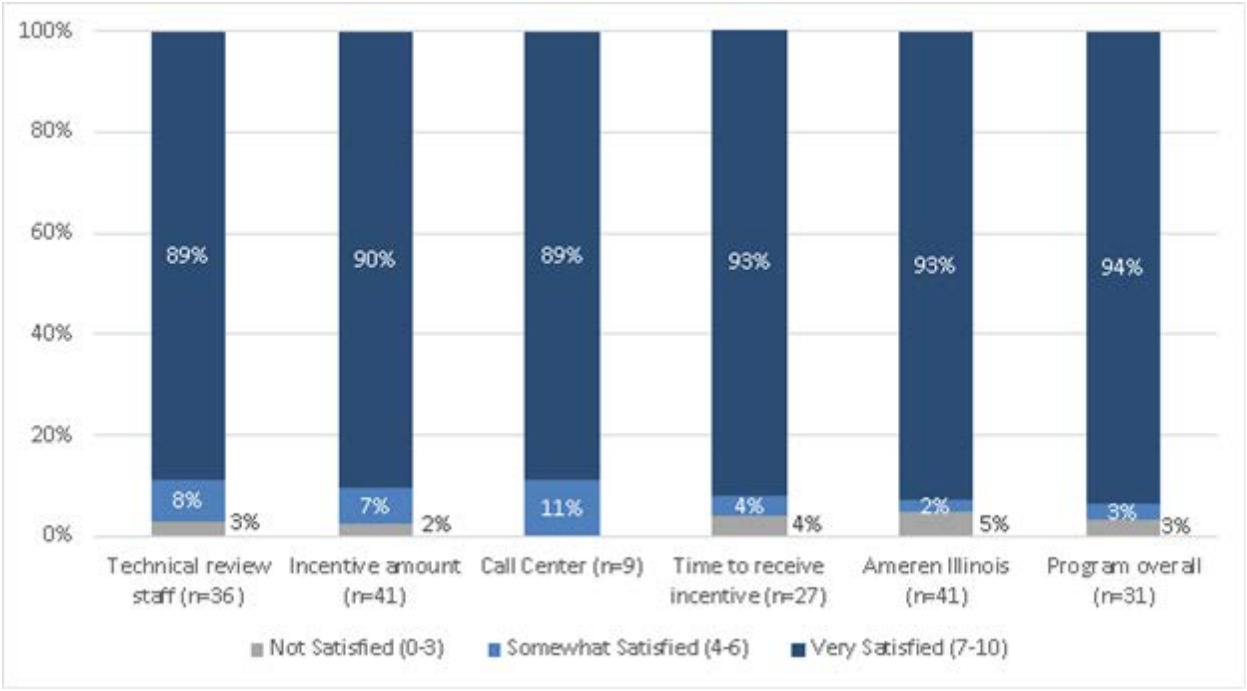
While many ActOnEnergy Business Program participants work with a contractor on their project, almost three-quarters of participants (71%) filled out the application form themselves, and most (84%) submitted the application online. Among those who filled out the form, most (65%) said that

the form is very easy to complete (7-10 on a 0-10 scale where 0 is "very difficult" and 10 is "very easy," mean of 7.2). Only two of the 41 participants interviewed experienced any problems during the participation process. The two who had difficulty indicated that they had trouble finding the right information for the application form, and that they encountered difficulty in aligning the project timing with AIC's program year.

## Participant Satisfaction

Overall, participants are highly satisfied with the program overall, as well as each aspect of the program, as shown in Figure 10 below. This level of support for the program is one reason why almost all participants (93%) plan to participate in the program again.

**Figure 10. Overall Custom Program and Component Satisfaction Scores**




Note: Not all categories total to 100% due to rounding. In addition, some n's are less than 41, as some respondents selected "not applicable."

Additionally, participants are very satisfied with their contractors. When asked to rate their contractor's ability to meet their needs on a scale of 0-10 where 0 is "not at all able" and 10 is "completely able," participants give their contractors a mean rating of 9.2. Overall, the majority of respondents (79%) use a contractor to implement their Custom projects, but only 30% stated that they used a contractor that was affiliated with the program, while 15% did not know if their contractor was affiliated or not. In general, this is consistent with past findings, illustrating that participants are not familiar with Program Ally terminology and may not understand contractors' relationships with the program. With that said, almost three-quarters (70%) of all participants interviewed indicate that it is somewhat or very important (as indicated by a 4 or greater on a 0-10 scale) that their contractor is registered with the program.

## Benefits and Barriers to Participation

Table 14 indicates that program participants see the energy savings and financial incentive provided by the program as the key benefits of taking part. Other responses echoed the financial benefits of participation, such as the lower maintenance costs associated with upgraded equipment (15%), saving money in general (10%), and the ability of the program to make projects feasible from a financial perspective (7%).

**Table 15. Benefits to Participating in the Program (Multiple Response)**

| Program Benefits | Percent of Participants (n=41) |
|---|---|
| Energy savings | 54% |
| Incentive | 41% |
| Lower maintenance costs | 15% |
| Better quality/new equipment | 15% |
| Saving money | 10% |
| Make projects financially feasible | 7% |

Table 15 shows that, in terms of potential barriers to participation, program participants generally perceive a lack of awareness and financial reasons to be the most significant barriers to participation by companies like theirs, which is consistent with findings from prior years.

**Table 16. Barriers to Participation (Multiple Response)**

| Barriers | Percent of Participants (n=41) |
|---|---|
| Not aware of the program | 37% |
| Financial reasons | 20% |
| Cumbersome paperwork | 12% |
| Not aware of savings potential | 10% |
| Time-consuming process | 7% |

### *Participant Decision-Making*

In an effort to better understand the underlying factors impacting participation, the evaluation team explored the decision-making process for participating customers. Key findings, shown in Table 16, are that most decisions are made location-by-location (66%), rather than company-wide (34%), and tend to involve someone in management (30%) or an engineer (25%), rather than the building owner (16%). Further, the decision to pursue an energy-efficient project usually involves two to five people (44%) and rarely involves only one decision-maker (15%).

**Table 17. Decision-Maker Characteristics**

| Decision Level among Multi-Location Respondents | Percentage of Participants (n=29) |
|---|---|
| By location | 66% |
| Company-wide | 31% |
| Regional | 3% |

| Number of Decision-Makers | Percentage of Participants (n=41) |
|---|---|
| 1 | 15% |
| 2-5 | 44% |
| 6-10 | 20% |
| Over 10 | 15% |
| Don't know | 7% |

| Decision-Maker Titles | Percentage of Participants (Multiple Response) (n=41) |
|---|---|
| Management | 46% |
| Engineer | 39% |
| Owner | 24% |
| Executive staff | 22% |
| Board of directors | 7% |
| Other | 12% |
| Don't know | 5% |

The team also asked respondents about barriers that decision-makers face when considering energy efficiency projects. As shown in Table 18 below, the need to prove the return-on-investment is the top reason (40%), followed closely by a lack of available capital (30%). Surprisingly, gaining internal consensus was cited by only 29% of participants, despite most decisions being made by more than one person (as shown in Table 17 above).

**Table 18. Barriers to Internal Approval of Energy Efficiency Projects (Multiple Response)**

| Internal Barriers to Project Approval | Percent of Participants (n=41) |
|---|---|
| The need to prove savings, ROI | 57% |
| Available capital | 43% |
| Gaining consensus | 29% |
| Lack of time | 14% |

### 4.1.4 OPPORTUNITIES FOR PROGRAM IMPROVEMENT

When asked to provide examples of how the program could be improved, Table 18 shows that half of participants (49%) offered no recommendations, which is higher than all previous program years (i.e. PY3 29%). Among those who did make suggestions (51%), recommendations were typical for programs of this type. Improvement of the application process was the most frequently cited with 16%, an increase from PY3 when less than 1% of participants mentioned it. This is an issue that has been raised in the past by contractors as well. In particular, in PY4, the contractor survey effort found that the top suggestion for improvement for the ActOnEnergy Business Program among contractors was the application process (20%, n=49).

There has also been a steep decline in the percentage of participants citing the desire for higher incentives. Only 9% of participants mentioned higher incentives which is significantly lower than the 23% who mentioned it in PY3.

**Table 19. Participant Recommendations for Program Improvement (Multiple Response)**

| Recommendations | Percent of Participants (n=41) |
|---|---|
| No recommendations | 47% |
| Easier application form/less paperwork | 16% |
| Higher incentives | 9% |
| Quicker responses from staff/faster turnaround time | 9% |
| More measures | 7% |
| More incentives | 7% |
| Key account executives provide more information/are more knowledgeable | 5% |
| Other | 7% |
| Don't know | 2% |

## 4.1.5 POTENTIAL ENGAGEMENT WITH NON-PARTICIPANTS

Figure 11 illustrates that only a relatively small percentage (20%) of non-participants familiar with the ActOnEnergy Business Program are very likely to participate in the next year. Among those who are not likely to participate, the primary reasons cited are that they do not need any new equipment (33%), and that they do not believe that what they might need would qualify (22%). The latter comment may be a reflection of the fact that few non-participants have a good understanding of program details.

**Table 20. Likelihood of Participation within One Year among Non-Participants familiar with ActOnEnergy**

| Likelihood of Future Participation | Percent of Respondents (n=55) |
|---|---|
| Very likely | 20% |
| Somewhat likely | 46% |
| Not very likely | 22% |
| Not at all likely | 11% |

Note: Values are based on valid responses (i.e., the "Don't Knows" and refusals have been removed).

### *Market Trends and Equipment Purchases*

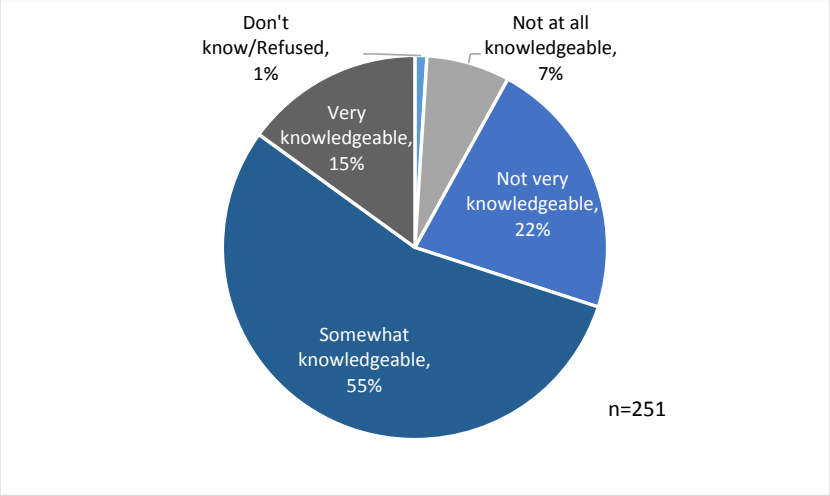
In order to further understand the potential for participation among non-participants, the team asked a series of questions about current practices and decision-making criteria used by these customers.

## Efficiency of Existing Equipment

In general, the majority of respondents feel they have some knowledge of different ways their company can save money by using energy more efficiently (70%). However, only a small percentage (15%) believe they are very knowledgeable. In general, those with some perceived knowledge consider their facilities to be at least somewhat efficient. More specifically, among respondents that are somewhat or very knowledgeable about ways to save money through energy efficiency, slightly more than half (52%) believe their facility is somewhat efficient, with another 42% believing their facility is very efficient, and 5% rating their facility as not efficient. This poses a potential challenge to the program, as customers that feel they have knowledge and an efficient facility likely will not feel the need to participate in the program.

The non-participant survey also revealed that perceived facility efficiency is not based on information provided through audits. For example, Figure 12 shows that only 4% of respondents indicate they have had an energy audit or consultation to assess their facility's energy efficiency. Despite the low frequency of audits among business customers, as mentioned above, almost three-quarters of non-participants (70%) consider themselves very or somewhat knowledgeable of different ways they can save money by using energy more efficiently.

**Figure 11. Perceived Knowledge of Ways to Save Money by Using Energy More Efficiently**

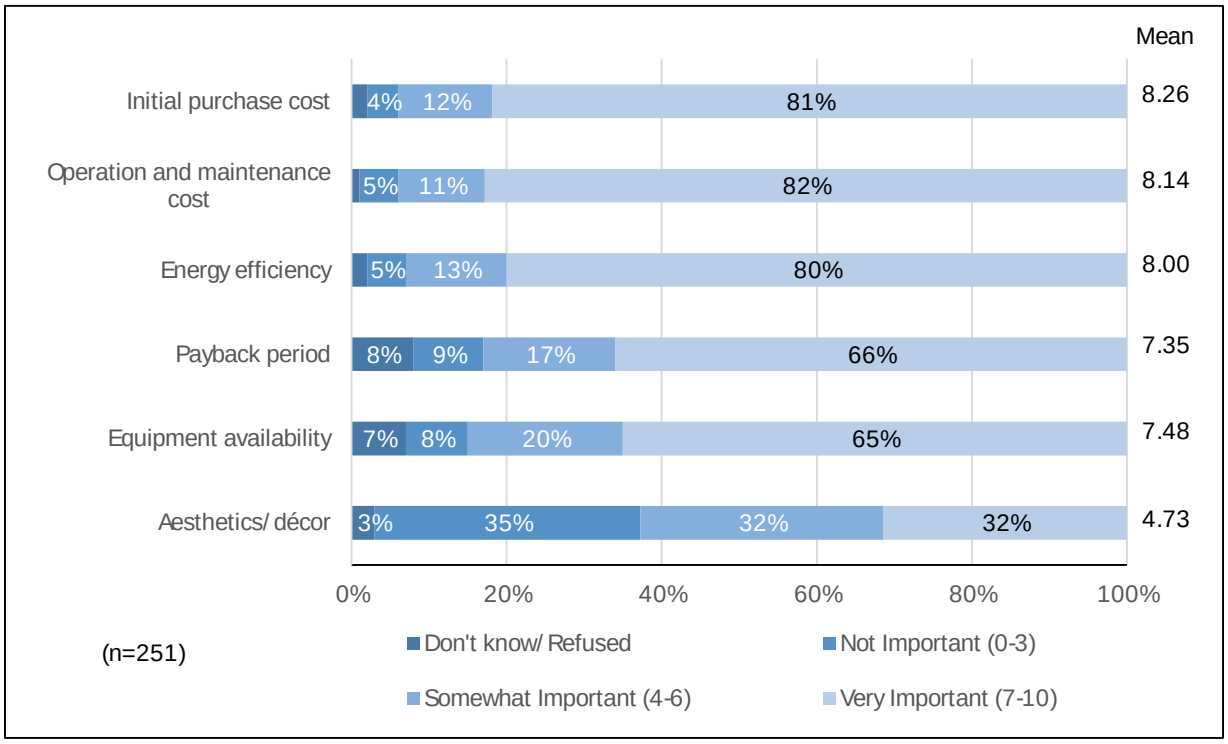



These findings further illustrate potential barriers to participation among non-participants. In particular, customers' current views of efficiency may not be based on real data about their facility or an understanding of all of the options available to them.

## Decision-Making

When considering the purchase of new equipment, Figure 13 shows that non-participants rank the initial purchase cost, operation and maintenance costs, and energy efficiency as top concerns (mean scores of 8.26, 8.14, and 8.00, respectively, on a 10-point scale where 0 is "not at all important" and 10 is "very important"). Further analysis revealed that self-categorized small businesses rate energy efficiency as more important than other-sized businesses do (mean score of 8.19 compared to 7.52 for medium and large businesses).

**Figure 12. Importance of Factors in Purchase Decisions for Energy-Using Equipment**




## 4.2 IMPACT RESULTS

### 4.2.1 VERIFICATION AND GROSS IMPACTS

**For the Custom Program, the evaluation team verified program participation and gross impacts through on-site visits with a sample of participating customers. The site-specific M&V leads to the development of a gross realization rate that is applied to the population of all projects in the program.**

### Site-Specific Results

**Table 21 below presents the results of the gross savings analysis for the 40 Custom sites in the sample.[13] It is important to note that individual projects had realization rates ranging from zero to approximately 162% for electric and zero to 317% for gas.**

[13] Detailed site visit reports from 10 of the largest Custom projects are included in Appendix C.

**Table 21. Gross Impact Realization Rate Results for the Custom Sample**

| ProjectID | Wave | Strata | Ex Ante Savings Claimed | | | Ex Post Savings | | | Realization Rate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | kW | kWh | Therm | kW | kWh | Therm | kW | kWh | Therm |
| 501358 | 2 | 3 | 1,801 | 14,046,687 | 0 | 1,548 | 12,346,805 | 0 | 86% | 88% | N/A |
| 500295 | 1 | 3 | 604 | 5,220,721 | 0 | 981 | 8,477,615 | 0 | 162% | 162% | N/A |
| 500027 | 2 | 3 | 666 | 3,536,266 | 0 | 0 | 0 | 0 | 0% | 0% | N/A |
| 500908 | 2 | 3 | 142 | 2,386,000 | 0 | 110 | 2,075,777 | 0 | 77% | 87% | N/A |
| 500321 | 2 | 3 | 194 | 1,650,384 | 0 | 233 | 1,977,517 | 0 | 120% | 120% | N/A |
| 500006 | 1 | 3 | (71) | 1,554,046 | 0 | 180 | 1,594,991 | 0 | -254% | 103% | N/A |
| 500253 | 2 | 3 | 298 | 1,439,482 | 0 | 217 | 1,823,166 | 0 | 73% | 127% | N/A |
| 500243 | 1 | 3 | 164 | 1,437,800 | 0 | 164 | 1,437,800 | 0 | 100% | 100% | N/A |
| 500078 | 1 | 3 | 145 | 1,268,750 | 0 | 250 | 1,457,940 | 0 | 173% | 115% | N/A |
| 500005 | 1 | 3 | (20) | 991,524 | 0 | 121 | 1,037,740 | 0 | 599% | 105% | N/A |
| 500127 | 2 | 2 | 70 | 609,608 | 0 | 78 | 623,377 | 0 | 112% | 102% | N/A |
| 500120 | 1 | 2 | 59 | 513,599 | 0 | (24) | 59,031 | 0 | -41% | 11% | N/A |
| 501100 | 2 | 2 | 70 | 457,974 | 0 | 55 | 389,642 | 0 | 78% | 85% | N/A |
| 500028 | 2 | 2 | 51 | 448,890 | 0 | 28 | 352,173 | 0 | 55% | 78% | N/A |
| 500262 | 2 | 2 | 70 | 430,282 | 0 | 6 | 104,710 | 0 | 9% | 24% | N/A |
| 500857 | 2 | 2 | 88 | 328,749 | 0 | 46 | 278,022 | 0 | 53% | 85% | N/A |
| 500566 | 1 | 2 | 27 | 235,278 | 0 | 31 | 269,347 | 0 | 114% | 114% | N/A |
| 500887 | 2 | 2 | 27 | 235,140 | 0 | 27 | 237,092 | 0 | 99% | 101% | N/A |
| 500817 | 2 | 2 | 29 | 226,122 | 0 | 35 | 273,126 | 0 | 120% | 121% | N/A |
| 500366 | 1 | 2 | 27 | 178,890 | 0 | 51 | 280,836 | 0 | 190% | 157% | N/A |
| 500280 | 1 | 2 | 13 | 133,090 | 0 | 10 | 43,570 | 0 | 81% | 33% | N/A |
| 500042 | 1 | 2 | 44 | 117,074 | 20,261 | 44 | 88,574 | 6,646 | 100% | 76% | 33% |
| 500003 | 1 | 2 | 20 | 114,400 | 32,024 | 20 | 122,120 | 26,707 | 100% | 107% | 83% |

| ProjectID | Wave | Strata | Ex Ante Savings Claimed | | | Ex Post Savings | | | Realization Rate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | kW | kWh | Therm | kW | kWh | Therm | kW | kWh | Therm |
| 500049 | 1 | 2 | 13 | 111,573 | 16,006 | 5 | 123,233 | 2,964 | 37% | 110% | 19% |
| 500244 | 1 | 2 | 12 | 102,988 | 0 | 12 | 102,988 | 0 | 100% | 100% | N/A |
| 501017 | 2 | 1 | 22 | 50,881 | 0 | 17 | 9,202 | 0 | 78% | 18% | N/A |
| 500452 | 1 | 1 | 5 | 39,770 | 0 | 7 | 55,628 | 0 | 151% | 140% | N/A |
| 500480 | 1 | 1 | 5 | 39,770 | 0 | 7 | 55,562 | 0 | 151% | 140% | N/A |
| 501063 | 2 | 1 | 4 | 39,487 | 4,075 | 7 | 49,178 | 12,892 | 168% | 125% | 316% |
| 500895 | 2 | N/A | 0 | 0 | 425,040 | 0 | 0 | 433,060 | N/A | N/A | 102% |
| 500004 | 2 | N/A | 0 | 0 | 181,319 | 0 | 0 | 145,581 | N/A | N/A | 80% |
| 500290 | 2 | N/A | 0 | 0 | 38,456 | (0) | 0 | 38,184 | N/A | N/A | 99% |
| 500109 | 2 | N/A | 0 | 0 | 31,199 | 0 | 0 | 6,993 | N/A | N/A | 22% |
| 500211 | 2 | N/A | 0 | 0 | 24,118 | 0 | 0 | 6,935 | N/A | N/A | 29% |
| 500236 | 2 | N/A | 0 | 0 | 16,632 | 0 | 0 | 44,738 | N/A | N/A | 269% |
| 500773 | 2 | N/A | 0 | 0 | 7,216 | 0 | 0 | 3,126 | N/A | N/A | 43% |
| 500786 | 2 | N/A | 0 | 0 | 7,216 | 0 | 0 | 11,659 | N/A | N/A | 162% |
| 501784 | 2 | N/A | 0 | 0 | 1,912 | 0 | 0 | 2,461 | N/A | N/A | 129% |
| 501099 | 2 | N/A | 0 | 0 | 876 | 0 | 0 | 801 | N/A | N/A | 91% |
| 501007 | 2 | N/A | 0 | 0 | 330 | 0 | 0 | 0 | N/A | N/A | 0% |
| **TOTAL** | | | **4,578** | **37,945,225** | **806,680** | **4,265** | **35,746,762** | **742,746** | | | |

In addition, Table 22 and Table 23 below present the results of the gross savings analysis for the 40 Custom sites in the sample by technology category.

**Table 22. Custom Site Visit Results – Electric and Demand Impacts**

| Technology | Total Projects with Electric Savings | kW Savings | | | kWh Savings | | |
|---|---|---|---|---|---|---|---|
| | | Ex Ante | Ex Post | RR | Ex Ante | Ex Post | RR |
| Pumps/Fans | 6 | 3,019 | 3,085 | 102% | 23,415,772 | 25,600,653 | 109% |
| Compressed Air | 8 | 292 | 726 | 248% | 5,661,323 | 5,599,745 | 99% |
| Lighting | 3 | 198 | 193 | 98% | 1,591,668 | 1,549,990 | 97% |
| EMS/Controls | 4 | 168 | 135 | 81% | 2,616,601 | 2,359,379 | 90% |
| Boiler/Furnace | 1 | 33 | 30 | 93% | 247,490 | 165,690 | 67% |
| Miscellaneous | 5 | 868 | 96 | 11% | 4,412,370 | 471,306 | 11% |

Within the Boiler/Furnace category, the relatively lower electricity savings were driven by one project that involved the installation of a grain dryer, and the amount of grain that is processed using the dryer was found to be significantly different than what was assumed in the *ex ante* analysis. Further, the low savings realization rate in the Miscellaneous category is also due to one project that involved electric arc furnaces. The original savings estimates were based on studies that were completed for other facilities. Based on the production and furnace electricity usage data collected for these sites from the customer, the improvement in melt efficiency for the furnaces was less than anticipated.

As shown in Table 23, overall there was less variation in the realization rates for technologies with gas savings compared with the electric savings presented above.

**Table 23. Custom Site Visit Results – Gas Impacts**

| Technology | Total Projects with Gas Savings | Therm Savings | | |
|---|---|---|---|---|
| | | *Ex Ante* | *Ex Post* | RR |
| EMS/Controls | 3 | 21,993 | 18,317 | 83% |
| Boiler/Furnace | 6 | 338,180 | 283,922 | 84% |
| Miscellaneous | 5 | 446,507 | 440,507 | 99% |

## Overall Program Results

Based on the site visit results detailed above, the overall Custom Program realization rates are 0.85 for electricity, 0.74 for demand, and 0.97 for gas, as shown in Table 24 below. The relative precision is 9% for kWh, 11% for kW, and 10% for therms. These results reflect the two-wave sample design, and are not the result of a simple average. Overall, the impact analysis activities yielded *ex post* gross estimates that are lower than *ex ante* estimates, as shown in Table 24 below.

**Table 24. Custom Program Gross Impacts**

| Program | Projects | *Ex Ante* Gross | | | *Ex Post* Gross | | | Realization Rate | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MW | MWh | Therm | MW | MWh | Therm | MW | MWh | Therm |
| Custom | 172 | 24 | 74,376 | 926,702 | 18 | 63,465 | 898,627 | 74% | 85% | 97% |

## 4.2.2 NET IMPACTS

As described in the Methodology section, the team applied the PY3 NTGR (0.75 for electric and 0.81 for gas) to Custom Program gross impacts to determine PY5 net impacts for all Custom projects except those completed through the Staffing Grant. For the eight Staffing Grant participants interviewed, the team assigned the NTGR developed through the interview process to all Custom projects completed by those participants if the NTGR based on interview findings was higher than the corresponding PY3 NTGR. In total, this affected seven of the eight AIC customers interviewed and 11 Custom projects. Overall, the NTGR associated with the PY5 Staffing Grant recipients and all of their associated projects (not only Custom) was 0.92. Table 25 below provides the NTGRs for each of these seven Staffing Grant recipients. Please note that only 11 of the 29 projects shown are included in the Custom Program.

**Table 25. PY5 NTGR Results for Staffing Grant Recipients**

| Final NTGR | Number of Projects |
|---|---|
| 0.78 | 3 |
| 0.84 | 4 |
| 0.87 | 1 |
| 0.90 | 1 |
| 0.95 | 3 |
| 0.98 | 10 |
| 1.00 | 7 |

Table 26 below presents the PY5 net impacts for the Custom Program based on the Staffing Grant results and the application of PY3 NTGRs.

**Table 26. Custom Program Net Impacts**

| Program | *Ex Ante* Net Impacts | | | *Ex Ante* NTGR (E/G) | *Ex Post* NTGR[a] | Ex Post Net Impacts | | |
|---|---|---|---|---|---|---|---|---|
| | MW | MWh | Therms | | | MW | MWh | Therms |
| Custom | 18 | 55,782 | 750,629 | 0.75/0.81 | 0.81/0.81 | 14 | 51,674 | 729,439 |
| | | | | | *Net Realization Rate* | *0.76* | *0.93* | *0.97* |

[a] The NTGR presented here differs from the 0.75 PY3 Custom NTGR as a result of integrating results from the Staffing Grant participants. However, in general, the team did apply the PY3 NTG for this program as planned.

# A. APPENDIX: DATA COLLECTION INSTRUMENTS

**The following files contain the Staffing Grant interview guide and Custom participant survey.**

C&I Staffing Grant Interview Guide FIN

PY5 C&I Custom Participant Survey FI

Ameren PY5 CI Non-Participant Sur

# B. APPENDIX: NTGR RESULTS

In PY5, the evaluation team was tasked with gathering data to update the Custom Program's net-to-gross ratios (NTGRs) for application in PY7. As a result, the team conducted research with program participants to update existing values. Consistent with prior program years, the NTGR developed in PY5 is based on self-reported information from the CATI survey that quantifies the percentage of the gross program impacts that can reliably be attributed to the program.

Additionally, the team fielded a non-participant survey to gather information regarding possible spillover. Because the non-participant spillover (NPSO) could be derived from any C&I program implemented by AIC, the team used the impacts from all C&I programs (i.e., Custom, Standard, and Retro-Commissioning) to calculate the NPSO value. Results from this analysis are presented in the PY5 Standard report.

## NTGR Evaluation Methods

The goal of the net impact analysis is to determine the program's net effect on participating customers' electricity usage. The evaluation team derived net program impacts by estimating an NTGR based on self-reported information from the CATI survey that quantifies the percentage of the *ex ante* gross program impacts that can reliably be attributed to the program. As in previous program years, the team calculated NTGR based on both the level of free ridership and participant spillover.

### *Free ridership*

Free riders are program participants who would have implemented the incented energy-efficient measure(s) even without the program. These estimates are based on a series of questions that explore the influence of the program in making the energy-efficient installations, as well as likely actions had the incentive not been available. The team developed a net-to-gross factor that consists of three scores: overall influence, influence of program components, and influence of program timing.[14]

1. **Overall Influence.** This score is based on two survey questions. The first question asked respondents to rate the importance of the program compared to the importance of other factors in their decision to implement the energy-efficient equipment. To do so, respondents were asked to divide 100 points between program and non-program factors. This score is equal to the number of points given to the program divided by 10. The second question asked if they had learned about the program before or after they decided to implement the energy-efficient equipment rather than standard-efficiency equipment. If respondents learned about the program *after* deciding to install energy-efficient equipment, the value from the first question (the total points given divided by 10) is halved. As a result, greater importance of the program means lower level of free ridership.

   For example, if a respondent gave the program 70 points out of 100, the first component of the overall influence score would be 7 (70/10). If that same respondent said they learned

[14] This algorithm is based on the basic rigor self-report method used in California, and is the same method used for the ComEd C&I programs.

about the program before they decided to implement the energy-efficient equipment, their score would remain a 7. However, if they said they learned about the program *after* they decided to implement the energy-efficient equipment, their score would be divided in half and equal 3.5 (7/2).

2. **Influence of Program Components.** This score is based on a series of five questions that asked respondents to rate the importance of five program components on a scale of 0 to 10 (where 0 is "not at all important" and 10 is "very important"): the incentive amount, program marketing materials, recommendation from program staff, recommendation from a key account executive, and information from a Feasibility Study if conducted. This score is equal to the highest rating given to any one of these components. Greater importance of the program components means lower level of free ridership.

   In this case, if a respondent rated the program rebate 10 out of 10, the recommendation of program staff 8 out of 10, and the information from program materials 8 out of 10, the final Influence of Program Components score would be a 10 (the highest of all the scores given).

3. **Influence of Program Timing.** This score is developed based on three questions: 1) the likelihood that the exact same equipment would have been installed without the program (on a scale of 0 to 10); 2) if the installation would have been done at the same time without the program; and 3) if the installation would have been done later, how much later. This score takes the response to the likelihood question and adjusts this value by the responses to the timing questions. A greater likelihood of participating without the program means a higher level of free ridership. Later implementation without the program means a lower level of free ridership.

   For example, if the participant says they would have installed the same equipment at the same time, they are considered a full free rider for this part of the net-to-gross index. If they likely would have installed the equipment (a rating between 7 and 10) but would have done it later, they are considered a partial free rider and the influence of the program influence is higher. Information about how much later (determined by question #3) helps the team to assign a free ridership value. If the customer would not have installed the same equipment until four years later, they are not considered a free rider for this component of the net-to-gross index (i.e., the program is given full influence on the timing of the installation).

Each score can take on a value of 0 to 10, where a higher score means a lower level of free ridership. The overall net-to-gross factor for a project is the average of the three scores, divided by 10. The net-to-gross factor for each project thus ranges from 0 (100% free ridership) to 1 (no free ridership).

For larger projects, this approach is normally supplemented with findings from interviews with trade allies where the participant indicates they played an important role in their decision to participate in the program.[15] However, in the current effort, no respondents required interviews with trade allies or a key account executive based on their stated level of influence in the participant's decision-making.

[15] Projects with estimated *ex ante* kWh savings of 600,000 kWh or more were assessed under this Standard rigor approach.

### Participant Spillover

The evaluation team examined spillover using participant responses to the phone survey, as well as callbacks where needed. Based on this data, the team found spillover for one Custom Program participant in the AIC service territory. The team conducted an engineering assessment of participant responses and gathered additional information via follow-up interviews to determine the savings associated with measures installed outside of the program. The participant was influenced by the program to install additional lighting, specifically LEDs.

## Custom Program NTGR Results

Table 27 below presents the results of the PY5 data collection to inform an updated NTGR for the Custom Program for application in PY7. As noted above, the team found spillover among one participant. Further, the Standard report outlines our non-participant spillover findings, which provided a portfolio level non-participant spillover value of 0.32. This value is not included in the NTGR provided in Table 27.

**Table 27. C&I Custom Program NTGR for use in PY7**

| Program | Free Ridership | Participant Spillover | NTGR (1-FR+SO) |
|---|---|---|---|
| Custom Electric | 0.26 | 0.001 | 0.74 |

Overall, the final PY5 value is lower than the interim value presented in March based on the Wave 1 survey alone (0.77), but is generally consistent with the electric value developed in PY3 (0.75).

In contrast, this is the first year in which the team has developed a gas NTGR for the Custom Program and the number of responses was limited. As a result of the small number of respondents and known volatility around NTGRs based on fewer than 10 responses, the team recommends conducting additional research in PY6.

**Table 28. C&I Custom Program NTGR for Future Exploration**

| Program | Free Ridership | Spillover | NTGR (1-FR+SO) |
|---|---|---|---|
| Custom Gas | 0.42 | – | 0.58 |

As shown in Figure 13, the results per respondent varied significantly with the largest projects driving the overall NTGR downward.[16]

[16] Note that while the team completed surveys with 14 participants in end-use categories that had gas savings, only a sub-set of those participants (n=8) had a project with gas savings.

**Figure 13. Custom Gas NTGRs**


## Spillover

Participant spillover refers to energy efficiency installations that were influenced by the program but did not receive an incentive. An example of participant spillover is a customer who installed incented equipment in one facility and, as a result of the positive experience, installs additional equipment at other facilities but does not request an incentive (outside spillover). In addition, the participant may install additional equipment at the same facility because of the program (inside spillover).

The evaluation team examined both inside and outside spillover using participant responses to the telephone survey. Based on this data, spillover was found among one Custom participant in the AIC service territory, who installed LED lighting. The team conducted an engineering assessment of participant responses to determine the savings associated with measures installed outside of the program.

The total spillover reported by the Custom sample equaled 7 MWh, while total ex post gross savings of the participant sample equaled 11,758 MWh. The following equation provided the program
spillover rate:

$$Spillover\ \% = \frac{Total\ participant\ net\ sample\ spillover\ (MWh)}{Total\ participant\ sample\ gross\ savings\ (MWh)} = \frac{7\ MWh}{11{,}758\ MWh} = 0.001\%$$

# C. APPENDIX: SITE VISIT REPORTS

PY5 AIC Final
Custom Site Visit Re