



# IMPACT AND PROCESS EVALUATION OF 2011 (PY4) AMEREN ILLINOIS COMPANY COMMERCIAL AND INDUSTRIAL CUSTOM ENERGY EFFICIENCY PROGRAM

**Final**

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# TABLE OF CONTENTS

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<b>1. EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>2. INTRODUCTION .....</b>	<b>3</b>
<b>3. EVALUATION METHODS .....</b>	<b>4</b>
3.1 Data Sources and Analytical Methods .....	4
3.2 Sampling and Survey Completes .....	10
<b>4. RESULTS AND FINDINGS .....</b>	<b>13</b>
4.1 Process Findings .....	13
4.2 Impact Results .....	26
4.3 Inputs for Future Program Planning .....	32
<b>A. APPENDIX: DATA COLLECTION INSTRUMENTS.....</b>	<b>33</b>
<b>B. APPENDIX: IMPLEMENTATION MODEL .....</b>	<b>34</b>
<b>C. APPENDIX: SITE VISIT REPORTS .....</b>	<b>38</b>

# TABLE OF TABLES

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

Table 2. Summary of Evaluation Methods..... 4

Table 3. Completed Staffing Grant Interviews..... 10

Table 4. Completed Program Ally Survey Points ..... 10

Table 5. Program Ally Online Survey Dispositions..... 11

Table 6. Two-Wave Custom Site Visit Sampling Approach ..... 12

Table 7. PY4 Custom Program Participation ..... 13

Table 8. PY4 Staffing Grant Participation..... 13

Table 9. PY4 Customer Promotional Efforts.....17

Table 10. Satisfaction with Staffing Grant Components..... 19

Table 11. Description of Contractor Services ..... 19

Table 12. Participating Contractor Promotional Strategies (Multiple Response) ..... 20

Table 13. Customer Awareness of the ActOnEnergy Program ..... 21

Table 14. Usefulness of Program Marketing Materials among Those Using Them ..... 22

Table 15. Main Benefits of Program Ally Participation ..... 22

Table 16. Participating Contractor Mean Satisfaction Scores..... 23

Table 17. Contractor Recommendations for Program Improvement ..... 24

Table 18. Customer Awareness of Energy Efficiency Options..... 24

Table 19. Contractor Perceived Barriers to Customer Participation..... 25

Table 20. Program Influence on Changes in Energy Efficient Equipment Sales ..... 25

Table 21. Program Impacts on Program Ally Business Practices..... 26

Table 22. Custom Site Visit Results – Electric and Demand Impacts..... 29

Table 23. Custom Site Visit Results – Gas Impacts..... 29

Table 24. Overall Custom Gross Realization Rates ..... 30

Table 25. Custom Program Gross Impacts ..... 30

Table 26. Custom Program Net Impacts ..... 32

# TABLE OF FIGURES

---

Figure 1. Ratio Adjustment Algorithm.....	7
Figure 2. Spillover Algorithm .....	9
Figure 3. Program Ally Network Growth .....	14
Figure 4. Marketing and Outreach Activities .....	17
Figure 5. Frequency of Program Promotion in the Past 6 Months .....	21
Figure 6. Impact of Program Ally Bonus Offers .....	23

# 1. EXECUTIVE SUMMARY

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This report presents results from the evaluation of the fourth program year of the Ameren Illinois Company (AIC) ActOnEnergy Custom Incentive Program for energy efficiency. For Program Year (PY) 4 (June 2011 to May 2012), AIC expected the savings from this program to account for 16% of the overall portfolio (including both residential and commercial) of electric savings and 16% of portfolio therm savings.

As a result, the PY4 evaluation of the Custom Program was impact focused with limited process evaluation activity. In particular, 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 recipients of the AIC staffing grant; and site visits to assess Custom projects. Below we present the key findings from the PY4 evaluation.

## Impact Results

Overall, the PY4 Custom Program reached 127 customers and achieved 47,837 MWh in net electric savings and 561,784 therms in net gas savings. These results demonstrate significant program growth over PY3 when the program achieved 30,341 MWh (158% increase).

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

Program	Ex Ante Net Impacts			Ex Post Net Impacts		
	MW	MWh	Therms	MW	MWh	Therms
Custom	6.20	46,644	541,838	5.98	47,837	561,784
<i>Net Realization Rate</i>				<i>0.96</i>	<i>1.00</i>	<i>1.04</i>

Per the Illinois Net-To-Gross (NTG) framework, the PY4 results are also based on the team's application of the PY2 Net-To-Gross Ratio (NTGR) for the majority of Custom projects. In addition, we developed NTGRs for the six staffing grant participants interviewed as part of the evaluation and applied their individual NTGRs on a retrospective basis.

## Process Results

According to program staff, the Custom Program ran smoothly in PY4 and benefitted from the addition of staff resources to the marketing team. While program marketing was strong in prior program years despite a shortage of human resources, PY4 staffing changes have helped to alleviate previous staffing constraints caused by the need for staff in various roles across the program to assist with outreach activities.

Findings from our research with participating contractors also indicate that satisfaction with the program remains relatively high and that services provided by the Program Ally Network are generally valued by registered contractors. One potential exception is program-sponsored roundtables, which 21% of registered contractors said they saw as the least valuable service provided by the program when

asked about a list of specific services.<sup>1</sup> Based on this feedback, program staff may want to collect additional data on this service as part of their annual Program Ally survey or through evaluation forms filled out by event participants.

Further, we found that AIC's new Staffing Grant initiative is operating consistent with its design. In particular, participants used the grant money they received from the program to reassign internal staff to manage energy efficiency projects, hire external project managers or engineers, or to consult with industry experts to identify potential areas for energy savings.

Based on the team's PY4 evaluation activities, we make the following recommendations for the program:

- **Continue the staffing grant program offering:** Interviews with grant recipients, as well as a review of grant applications illustrate both the need for this additional program incentive in overcoming barriers related to staff resources and expertise, and the effective implementation of the offering. Pending the availability of program funds, the team recommends the continuation of this incentive as a way to encourage greater participation in all of the AIC business programs.
- **Explore the feasibility of providing technical assistance:** While the majority of staffing grant participants we spoke with did not encounter any problems with the Custom Program application process, those participants from smaller businesses and organizations did report challenges with the process. While program staff have already demonstrated a commitment to meeting one-on-one with potential participants, and have hired a dedicated staff person to assist large commercial customers, the program should continue its current efforts to evaluate the ways in which they might be able to support smaller customers. In addition to training and program process changes already under consideration, one option could be the development of a participation guide for these customers that explains what resources are available for help with savings calculations or project specifications (related to the program or external sources) and who to contact if they have questions.<sup>2</sup>

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<sup>1</sup> The team asked this question (P11) of all survey respondents and not just those who had taken advantage of each service listed. Due to survey length, we did not have an opportunity to gather feedback on potential improvements to specific services.

<sup>2</sup> The team understands that program staff is implementing training in energy management, as well as streamlining program applications.

## 2. INTRODUCTION

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This report presents results from the evaluation of the fourth program year of the AIC ActOnEnergy Custom Incentive Program for electric and gas energy efficiency. For Program Year (PY) 4 (June 2011 to May 2012), the Custom Program is part of a business portfolio that includes the Standard and Retro-Commissioning programs. In addition, as in prior years, AIC continued to incentivize a small number of New Construction projects through the Custom Program.

To support the PY4 evaluation, we conducted research including a review of program materials and program-tracking data; interviews with program administrators, implementation staff, and participating contractors; and site visits to assess Custom projects. It is also important to note that the evaluation team assessed AIC's new Staffing Grant initiative as part of the Custom Program evaluation using in-depth participant interviews.

### ***Program Description***

The C&I Custom Incentive Program allows AIC business customers to complete energy efficiency projects that involve the installation of equipment not covered through the Standard Program. The availability of this program option allows customers to propose additional measures and tailor projects to their facility and equipment needs. In general, Custom incentives are available for lighting, HVAC, refrigeration, and motors. Participants can also implement projects involving compressed air, drives, energy management systems, and industrial process measures.

Consistent with prior years, the PY4 Custom Program serves as a channel for the submission of New Construction projects, which have been limited in number over the past three program years. 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. Further, AIC introduced Energy Advisors and other outreach staff to recruit potential participants to the program, as well as a Staffing Grant initiative to ensure that interested customers have the resources to implement projects.

The Staffing Grant offering launched in PY4 provides customers with additional funding to help address resource constraints and staff needs to aid in the implementation of energy efficiency projects. As part of the application process, customers must outline a set of proposed projects. Funds are ultimately distributed based on the proportion of proposed savings achieved.

Overall, AIC designed and continues to modify the Custom Program to overcome barriers to participation such as program awareness, a difficult application process, and corporate uncertainty. The company has taken specific steps to address these barriers in recent years including launching varied and innovative promotional offers such as the Early Completion Bonus and the Competitive Large Project Incentive (CLPI) initiative, as well as simplifying the application form and providing access to program staff during the project development phase.

## 3. EVALUATION METHODS

### 3.1 DATA SOURCES AND ANALYTICAL METHODS

The assessment of the fourth program year of the AIC Custom Program included both process and impact analyses. The objective of the PY<sub>4</sub> Custom Program evaluation was to provide estimates of gross and net electric and gas savings for the program, as well as assess 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.

Table 2. Summary of Evaluation Methods

Task	PY <sub>4</sub> Impact	PY <sub>4</sub> Process	Forward Looking	Details
Program Staff In-Depth Interviews		√		Provides insight into program design, processes, and changes since PY <sub>3</sub> .
Marketing Staff Interviews		√		Provides insight into the impact of staffing changes and the addition of new marketing roles.
Program Ally Survey		√		Provides insight into the program ally experience and barriers to participation
Staffing Grant Participant Interviews	√	√		Gathered data to support the development of NTGRs for these participants. The team applied these NTGRs retrospectively per the NTGR framework.
Site Visits	√			Data collection to inform participant verification and gross impacts.

#### 3.1.1 PROCESS ANALYSIS

The process analysis used data from two data collection methods: in-depth interviews and a quantitative Internet survey. In-depth interviews provided the team with a comprehensive understanding of changes in program design and implementation between PY<sub>3</sub> and PY<sub>4</sub>. We conducted these interviews in conjunction with the Standard Program evaluation and spoke with two program managers, the Large Industrial Sales Manager, a Program Ally Coordinator, the lead of the Marketing Team and three Energy Advisors.

We also fielded an Internet survey with contractors active in the ActOnEnergy program—both registered program allies and non-registered participating contractors—to gather information about their experience with the program and its impact on their business over time. In addition, we attempted a census of staffing grant participants to gather NTG-related information.

#### 3.1.2 IMPACT ANALYSIS

The gross impact analysis used data from project files and on-site visits with metered measurement

and verification (M&V). We did not estimate a net-to-gross ratio (NTGR) for PY4. Instead, we applied the NTGR developed through the PY2 evaluation given that the program's implementation has remained relatively consistent, as has its NTGR over the past three program years.

## 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 M&V efforts to estimate gross impacts. Overall, we reviewed a total of 45 Custom projects. For a random 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 accuracy of the ex ante energy savings. We 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 45 of the sites to provide increased certainty in the gross impact results (analysis for 25 sites used metered data collected through the installation of data loggers or collection of customer energy management system (EMS) data, while the remainder involved the verification measure operation). 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 detail about our methods and assumptions by project category.

- **EMS/Controls:** 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. Four of the projects verified included the installation or expansion of Direct Digital Control (DDC) systems to control HVAC systems, and two projects included the installation of programmable thermostats or temperature control systems. One project included the installation of controls to allow the use of a free cooling system, and another project allowed the scheduling of fan coil units.

The team verified these projects through customer interviews and on-site visits. For HVAC control systems, we determined the operation of the system through inspection of the control system and customer interviews. The set points of the EMS system were collected, and if available, trended data was taken from the EMS 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. We performed the savings calculations based on a regression analysis of customer monthly energy use. EMS/controls projects accounted for 8 of the 45 projects that we verified through on-site visits.

- **Lighting:** The lighting projects we reviewed involved efficient lighting systems for retail buildings, industrial buildings, exterior spaces, as well as a refrigerated warehouse. For retrofit projects, we compared the proposed system to the existing system to determine the ex post savings. We compared new construction projects to the ASHRAE 90.1 2004 standard lighting power densities for the appropriate building type using the whole building method or the space using the space-by-space method.

If the details about the fixture and bulb type were available, the team calculated the ex post savings using the wattages supplied by the customer, vendor, or typical fixture wattage values. We considered the energy consumption of the ballast, as well as the bulb. For lighting projects in refrigerated cases or refrigerated spaces, reducing the energy output of the lights also reduces the refrigeration load. We took this into account by dividing the lighting energy savings by the coefficient of performance (COP) of the refrigeration system to obtain the refrigeration savings. The total savings are then the sum of the lighting savings and the refrigeration savings.

We verified the quantity of lights by inspection during the on-site visit, and we obtained the hours of operation from the customer during the visit as well. The team did not meter lighting systems that operated under fixed schedules, ran continuously all year, or were controlled via time clocks. If the lighting system operated under a sporadic schedule, or if the lights were controlled via occupancy sensors, we installed light on/off or light level loggers for a minimum of one week to monitor the hours of operation of the lighting system. Lighting projects accounted for 8 of the 45 projects that we verified through on-site visits.

- **Compressed Air Systems:** The compressed air systems involved replacing older air compressors with newer variable frequency drive 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, we installed energy loggers on the air compressors to determine the typical and peak loading profiles. All of the Variable Frequency Drive (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. We 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. Compressed air projects accounted for 8 of the 45 projects that we verified through on-site visits.
- **Pumps/Fans:** Projects in this category involved the modification of pump or fan systems to control flow and minimize energy use. One of these projects included the installation of dampers. This allowed branches of a duct system for product waste collection to be shut off. This also allowed flow levels to be reduced and fans to be turned off. The remaining four projects involved the re-sheaving 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. We conducted verification of these projects through customer interviews and on-site visits. During the on-site visit, we verified the operation of the pumps or fans involved in the project. Additionally, we determined the pump or fan energy usage through metering or collecting EMS data. We compared this to the expected operation of the system prior to the project completion. The pump/fan projects accounted for 5 of the 45 projects that we verified.
- **Boiler/Furnace:** 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, we 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 through inspection and through customer interviews. Additionally, when possible, the savings, or the load profile on the furnace or boiler, were verified through a billed data analysis. The boiler and furnace projects accounted for 7 of the 45 projects that we verified.

➤ **Miscellaneous:** The remaining 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.

- Two of these projects were electric arc furnaces.
- Three projects included upgrades to chiller systems.
- One project was the installation of VFDs for grain elevator equipment.
- One project involved the installation of an efficient industrial burner.
- One project was the installation of an ozone laundry system.
- One project was the installation of efficient refrigerated cases at a grocery store.

Miscellaneous projects accounted for 9 of the 45 projects that we verified.

From the on-site sample, we calculated the gross impact for each site and extrapolated these findings to the participant population using the ratio adjustment method.<sup>3</sup> The team used the following algorithm to extrapolate to the population.

**Figure 1. Ratio Adjustment Algorithm**

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

Where

$I_{EP}$  = the ex post<sup>4</sup> population impact

$I_{EA}$  = the ex ante population impact

$I_{EPS}$  = the ex post impact from the sample

$I_{EAS}$  = the ex ante impact from the sample

## Net Impacts

The goal of the net impact analysis is to determine the program’s net effect on participating customers’ electricity and gas usage. After gross impacts were estimated, the team generally derived net impacts by applying the PY2 NTGR (0.69), which is based on self-reported information from a telephone survey

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<sup>3</sup> Cochran, William G. (1977). Sampling Techniques. New York: John Wiley & Sons.

<sup>4</sup> Ex post refers to the estimated impact found by the evaluation team.

that quantified the percentage of gross impacts that could reliably be attributed to the program. The PY2 value used was calculated based both on the level of free ridership and spillover.<sup>5</sup>

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

## Staffing Grant

The evaluation team took the following steps to arrive at a NTGR per participant that was applied to all of the projects that participants completed as a result of the grant.<sup>6</sup>

1. **Application Review:** We 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 NTG. 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 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), we used the following formula:

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

- Program Influence - Component 2: This 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). We asked these two questions for each of the projects that the participant implemented as a result of the grant.

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

$$QI = N10 \times 0.1$$

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

$$IF N11 = \text{“Never”}, T1 = 0$$

$$IF N11 = \text{“Same Time”}, T1 = 1$$

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<sup>5</sup> For gas only projects, the team applied the AIC ex ante NTGR of 0.8 as there was no gas program in PY2, and additional research has yet to be completed.

<sup>6</sup> 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.

*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.

$$\text{Component 2} = \text{Average}(QI, TI)$$

- **Overall Free Ridership - Combination of Components 1 and 2:** To calculate an overall program influence score, we 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).

$$FR = \text{Average}(\text{Component 1}, \text{Component 2})$$

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

$$NTG = 1 - FR$$

- **Spillover:** We also asked questions to gather information about potential spillover, which would be integrated with the NTG score as  $NTGR = (1 - FR + SO)$ . To determine the participant-level spillover factor, we divide 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

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

3. **Consistency Check:** If the evaluation team encountered a situation in which the interview findings contradicted the data available in the application, we conducted additional analysis and considered an adjustment to the score resulting from the interview. In particular, two different analysts assessed the application and the interview data from a given participant and arrived at independent NTGRs. After a discussion of the values, the analysts reached agreement on the score for the participant. This resulted in the adjustment of a single respondent NTG score from 0.5 to 0.75.
4. **Final NTGR Determination:** As a final step in this process, we compared the NTGR developed through the interview process above with the existing PY2 NTGRs for the various C&I programs. Given that the participant interviews described above are designed to assess the impact of a specific intervention (the staffing grant), and did not include the detailed measure level questions that are part of the Standard and Custom participant survey NTG batteries, we used the PY2 NTGRs as a floor. We chose to implement this floor for two reasons: 1) we cannot ask staffing grant participants 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 NTG survey batteries.

Based on this approach, if the NTGR developed through the staffing grant interview exceeded the PY2 value, we applied the new NTGR to all of the projects completed by that participant in PY4. However, if the newly developed NTGR fell below the established PY2 value, the team applied the appropriate PY2 value to each of the participant’s projects. We made this type of adjustment for five projects associated with two participating customers.

## 3.2 SAMPLING AND SURVEY COMPLETES

### 3.2.1 NTG INTERVIEWS

We conducted in-depth NTG interviews with staffing grant recipients during September and October 2012. 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 the table below.

**Table 3. Completed Staffing Grant Interviews**

	Population		Completed Interviews	
	Unique Customers	Associated Projects	Unique Customers	Associated Projects
Grant Recipients	8	31	6	26

Overall, the team spoke with participants responsible for 99% of the kWh savings and 100% of the therm savings associated with projects implemented by staffing grant recipients. Given that we made a census attempt, there is no sampling error or precision estimate associated with our NTG 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 INTERNET SURVEYS

#### Program Ally Internet Survey

The Internet survey with participating AIC contractors, which includes registered contractors (or program allies) and non-registered contractors that have participated in the ActOnEnergy Program at some point since its inception, focused on program participation, satisfaction, barriers to participation among eligible AIC business customers, and the impact of program participation on the program ally business and business practices. We sent an invitation to participate in the survey to all 907 participating contractors with valid email addresses, as well as follow-up reminders.

**Table 4. Completed Program Ally Survey Points**

	Population	Sample Frame	Completed Interviews
Contractors	991	907	49
Registered Contractors	573	569	35
Non-registered Contractors	418	338	14

Source: AIB Extract (dbo\_Allies table) provided in August 2012.

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

### Survey Dispositions and Response Rate

The survey with participating contractors was fielded from August 14 – September 9, 2012. The table below presents the survey dispositions and response rate.

**Table 5. Program Ally Online Survey Dispositions**

Disposition	N
Total Emails Sent	907
Completes (may include partials used in analysis)	49
Bounce Backs	114
No Response	744
<b>Eligible (907-114)</b>	<b>793</b>
<b>Response Rate (Completes/Eligible)</b>	<b>6.2%</b>

### 3.2.3 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 June 21, 2012.

The evaluation team selected a sample of 45 projects for engineering review and metered site verification in two waves. We chose the sample using a stratified random sample design. For the stratification, we used the Dalenius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available interviews to the strata. We also drew the sample in two waves to ensure 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.

The following table shows the sample selected in both waves. Overall, the 45 sites with on-site verification account for 86% of the programs' ex ante savings.<sup>7</sup>

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<sup>7</sup> 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 6. Two-Wave Custom Site Visit Sampling Approach**

Sampling Strata	KWh Savings Range	Number of Projects <sup>a</sup>	Site Visit Sample	Site Visits Completed
Wave 1				
1	700-100,000	31	4	4
2	100,001-1,000,000	13	8	8
3	1,000,001 – 6,000,000	4	4	4
Wave 2				
1	0-750,000	31	9	9
2	750,001-2,250,000	7	5	5
3	2,250,001-9,000,000	7	7	7
Gas <sup>b</sup>	N/A	10	10	10
<b>TOTAL</b>		<b>101</b>	<b>45</b>	<b>45</b>

<sup>a</sup> 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.

<sup>b</sup> The gas sample includes 8 gas only sites and 2 sites with both gas and electric savings.

The final sample design provides statistically valid impact results at the 90% confidence level +/- 3% precision on a kWh basis for the Custom Program overall. We calculated precision for our gross impact results by pooling the results from both waves of site visits.<sup>8</sup>

We conducted a census of gas projects and, as a result, there is no sampling error or precision associated with those estimates.

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<sup>8</sup> 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 PY<sub>4</sub> program focusing mainly on program marketing and outreach, as well as associated program implementation changes in this area. Results are based on in-depth interviews with program staff, a detailed review of the program marketing and implementation plans, and an Internet survey with participating contractors.

#### 4.1.1 PROGRAM PARTICIPATION

Overall, the Custom Program approved 103 unique projects, which involved the installation of 127 measures as summarized in Table 7 below. In general, fewer projects were completed in PY<sub>4</sub> compared to PY<sub>3</sub> (227 projects). However, this level of participation was sufficient to meet the program's electric energy savings goal, although not the gas goal, which increased more than 40% from PY<sub>3</sub>.

Table 7. PY<sub>4</sub> Custom Program Participation

Custom Program	PY <sub>4</sub> Total Measures	
	Number	Percent
Lighting	42	33%
HVAC	38	30%
Compressed air	16	13%
Industrial process	16	13%
Miscellaneous	5	4%
Drives	4	3%
Refrigeration	3	2%
Motors	3	2%
<b>Total</b>	<b>127</b>	<b>100%</b>

In addition, AIC launched a Staffing Grant initiative, which ultimately awarded 13 grants to 8 unique customer contacts. As shown in the table below, these grants led to a combined total of 31 projects and another group of projects that will be completed in PY<sub>5</sub>.

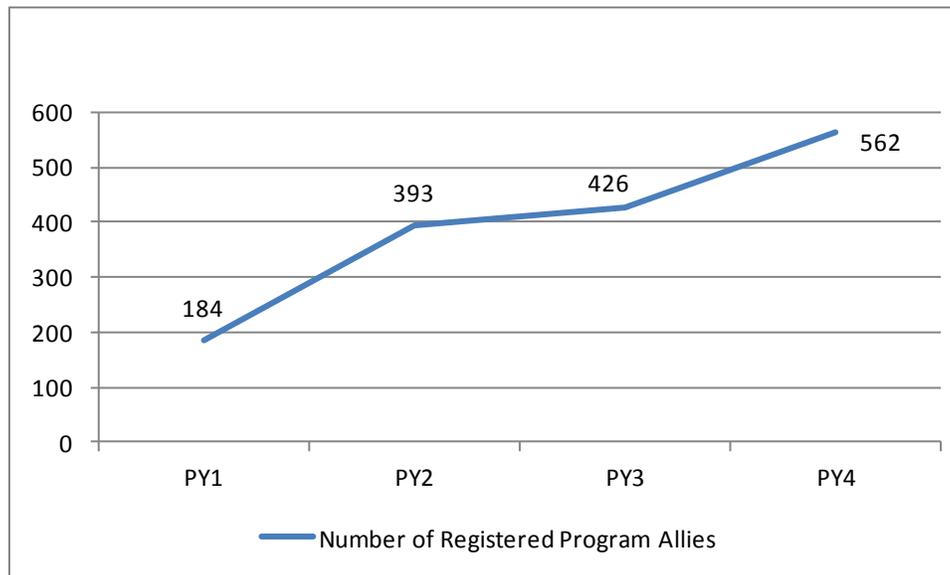
Table 8. PY<sub>4</sub> Staffing Grant Participation

Participation Details	Counts
Total Grants	13
Unique Customers	8
Associated Projects in PY <sub>4</sub>	31
Carryover Projects to PY <sub>5</sub>	14

## Program Allies

The ActOnEnergy Business Program provides participating contractors with the opportunity to register formally with the program. In doing so, the contractors become “Program Allies” and members of the ActOnEnergy Program Ally Network. In PY4, the program added 136 registered contractors bringing the total number of program allies to 562. Program staff was pleasantly surprised with the number of allies added in PY4 given their belief that outreach to contractors had gone well and there were few additional contractors who did not know about the program. As shown in Figure 3, the Program Ally Network has grown consistently since the program’s inception.<sup>9</sup>

Figure 3. Program Ally Network Growth



### 4.1.2 PROGRAM DESIGN AND IMPLEMENTATION

Based on interviews with program staff, the C&I Custom Program continued to function smoothly and effectively in PY4. With the addition of new staff members, particularly in the marketing area, the program was also able to continue its strong outreach efforts to potential participants. A hallmark of prior years, the program continued to implement promotional efforts aimed at generating participation in specific areas of the program. The following sections provide details on key program changes in PY4.

#### Acquisition of Additional Staff Resources

In PY4, the ActOnEnergy Business Program underwent significant staff changes. In particular, the program expanded its marketing team by hiring six Energy Advisors, two segment coordinators, one education and training coordinator, two Program Ally Coordinators, one material and web coordinator,

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<sup>9</sup> As outlined in the methodology section, our analysis includes allies active in both the Custom and Standard programs in PY4 and prior program years.

and a chain account coordinator to join the marketing team. The roles and responsibilities of the new staff are described below:

- **Energy Advisors.** The role of AIC's Energy Advisors is to perform customer outreach, as well as serve as a point-of-contact for customer service. There are seven Energy Advisors and each is responsible for a specific geographic region within the AIC service territory. Typical activities include cold-calling potential customers, traveling to both scheduled and cold customer meetings, working with customers to identify eligible projects for program incentives, connecting customers with program allies, and guiding customers through the application process as needed. These duties intersect with the other marketing staff, most frequently with Program Ally Coordinators, as well as Market Segment Coordinators.
- **Segment Coordinators.** This group focuses on building relationships with organizations or other entities that represent the segments that the program targets (e.g. the Chamber of Commerce). The coordinators promote the program to these groups through presentations, lunch and learns, and informational breakfasts. While the program has existing relationships with many of these organizations as a result of efforts in prior program years, the addition of dedicated staff in this area has allowed the program to expand these relationships as well as cultivate new relationships.
- **Education and Training Staff.** The addition of a dedicated education and training staff member in PY4 allowed the program to further develop its education and training offerings. The Education and Training Coordinator focuses much of their time on coordinating webinars and making training material available online, as these strategies have been effective in the past. In addition, they also offer live training such as Certified Energy Manager training. The training events are offered to both trade allies and customers.
- **Program Ally Coordinators:** This group recruits new trade allies through cold calling, presentations, and attendance at symposiums and trade shows. Notably, the program recruited 136 new trade allies in PY4—substantially more than the previous year. The coordinators also reach out to existing trade allies to keep them informed of program offerings.
- **Web and Materials Coordinator.** The Web and Materials Coordinator focuses on developing materials such as direct mailings, web advertisements, and emails. A major focus in PY4 was tailoring the materials to the appropriate target audience.
- **Chain Account Coordinator:** This staff person is responsible for implementing the ActOnEnergy strategy for national chain accounts and vendors and acting as the common SAIC voice with all national chain accounts across the country.

In addition to these implementation staff members, AIC Key Account Executives (KAEs) continue to help secure and facilitate relationships with the largest AIC customers as in prior years. KAEs can also facilitate leads for the Energy Advisors by helping to identify decision-makers at AIC customer facilities.

Further, there is frequent cooperation among most members of the marketing team, although few of the staff members with whom we spoke worked with the Chain Account Coordinator in PY4. In general, coordination among team members occurs on an as-needed basis when responsibilities for a given effort run across marketing roles. The following are examples of how the team interacts and communicates:

- Energy Advisors meet with each other on a bi-weekly basis to discuss progress towards

program goals, program changes, successful strategies, and potential opportunities.

- KAEs and Energy Advisors work together to guide interested customers through the program participation process.
- Market Segment Coordinators often ask Energy Advisors or one of the Program Ally Coordinators to co-present at seminars or meetings with Chambers of Commerce.

Those interviewed feel that the current program structure is effective. Each staff person interviewed was relatively new to the program, but each had the impression that the program experience has improved for both customers and AIC staff. They felt that having additional staff assigned to well-defined roles was important to the success of the marketing team. When the responsibilities of each marketing staff person are well defined, it is easy to identify and contact the relevant expert, and each staff person is clear about their role and their own set of goals within the program. Furthermore, by organizing contacts by geographic region rather than industry sector, the program has facilitated the staff's ability to visit customers in person, which is very effective for both finding energy saving opportunities and motivating participation.

### **4.1.3 MARKETING AND OUTREACH**

#### **Overview of Marketing and Outreach Activities**

Marketing and outreach efforts continue to be of critical importance to the Custom Program and business portfolio overall given sharply increasing savings goals and the launch of the first official year of gas programming. For the business portfolio overall, the electric savings goal increased 20% over PY3 and the gas goal increased by 40%.

Drawing upon its expanded marketing team, AIC continued to strengthen its marketing and outreach efforts in PY4. Overall, as illustrated in Figure 4, program marketing and outreach strategies were diverse and well rounded.

Figure 4. Marketing and Outreach Activities



While many of the tactics utilized in PY4 are consistent with those employed in the past, it is worth noting changes in the following areas:

- **Program Ally Communication.** Given that program allies are another channel through which AIC customers learn about the Custom Program, outreach to this group by the program implementer, as well as the level of promotion that program allies conduct themselves, is central to program growth. The program staff that we interviewed believed that the ActOnEnergy program is being effectively marketed to program allies. In particular, efforts in this area include educational webinars and training events, new program ally recruitment efforts, emails, direct mail, newsletters, and in-person meetings. While many of these activities are consistent with prior program years, the addition of Program Ally Coordinators enhanced what the program could achieve in this area.
- **Program Promotions:** The program continued to modify its incentive structure in PY4. As shown in the table below, the program updated its incentives for gas measures, as well as lighting and other measures.

Table 9. PY4 Customer Promotional Efforts

Promotion	Date	Description
Gas Incentive Increase	July 2011	The program increased the Custom gas incentive from \$0.80 per therm to \$1.20 per therm.
Additional Incentive Changes	February 2012	The program changed the lighting incentive to \$0.06/kWh and the incentive for other measures to \$0.08/kWh from \$0.05/kWh and \$0.07/kWh respectively.

## **4.1.4 PROGRAM PROCESSES**

### **Staffing Grant Participation**

The staffing grant offering was rolled out smoothly in PY4 and those customers who received grant funding used these additional financial resources in a number of ways. For example, recipients used the funds to reassign internal staff to manage projects, hire external project managers or engineers, or consult with industry experts to identify potential areas for energy savings. Below we present additional feedback on the staffing grant experience and its influence on recipients.

#### ***Barriers to Implementing Energy Efficiency Projects***

In general, the participants we spoke with encountered a range of barriers to implementing energy efficiency projects that varied depending on whether the recipient was a nonprofit or for-profit organization. For-profit organizations generally had strict financial guidelines that were used to determine whether the company would undertake an energy efficiency project. Some examples of these criteria include firms requiring a rate of return higher than 20% or other firms requiring a payback period under 1.5 years. Overall, meeting these financial criteria was the greatest barrier to implementing energy efficiency projects. However, once an employee could demonstrate that a given project met the criteria, it was fairly easy to gain internal approval for the project.

Other barriers mentioned by for-profit organizations included timing the upgrades to coincide with planned facility retrofits, the lower incentive levels in Illinois compared to neighboring states, and the fluctuating cost of energy. In addition, one grant recipient representing a particularly large company reported that although it was somewhat easy to get approval to complete projects for which energy savings had been calculated and met the financial requirements, it was difficult to find the money to bring in experts needed to identify the energy savings opportunities and estimate the savings associated with those potential projects in the first place.

Among nonprofit organizations, such as schools and churches, upgrades were generally performed when equipment was close to failing. According to grant recipients, the greatest barriers to implementing projects are the upfront costs of equipment and the lack of knowledge regarding energy efficiency among their staff. For this reason, while recipients used staffing grant funds to bring on additional staff, nonprofit organizations are more likely to supplement the incentives they receive from the utility with other grant money.

#### ***Awareness of the Grant Offering***

All of the participants with whom we spoke said they heard about the staffing grant opportunity either through an existing relationship with a program representative, or through an engineering firm who had worked with a program representative in the past. The feedback we gathered on the respondents' experience working with AOE staff was very positive. Generally, the respondents felt that the AOE staff was very helpful in answering questions and providing guidance throughout the grant application process.

#### ***Satisfaction with the Offering/Initiative***

We also asked respondents to rate their satisfaction with various aspects of the staffing grant offering

(see Table 10). The application form received lower mean satisfaction scores than the final review process or the grant award process. Some respondents thought that the form itself was too lengthy and complicated. However, overall, respondents were very satisfied with the review process and the grant award process.

**Table 10. Satisfaction with Staffing Grant Components**

Program Component	Mean Satisfaction Score (n=6)
The grant award process	8.6
The final review process	8.4
The application process	6.8

Note: Based on a 0-10 scale where 0 is very dissatisfied and 10 is very satisfied.

### **Project Implementation**

We asked respondents about the challenges that they faced in implementing energy efficiency projects as proposed in their staffing grant application. The challenge most commonly mentioned by respondents was aligning the staffing grant deadlines with their companies’ internal calendars. For example, most respondents’ internal planning and investment decision-making processes operate on a calendar year and they found it somewhat difficult to work with AIC’s June to May program year.

Another comment we heard from one particular participant was that pre-inspections occurred too soon after the grants were awarded. In this case, the recipient received the grant pre-approval form from AIC and then leveraged the staffing grant funds within their companies’ internal project approval and funding process. As a result, additional time was needed to solidify project plans and funding. The experience of this customer indicates that there may be a significant lag between when an applicant receives pre-approval from AIC and the start date for the projects they plan to implement. However, this was not a widespread area of concern for participants in general, and the team simply points out this issue as a potential challenge for the largest customers.

Our interviews also revealed that smaller customers found the Custom project approval process difficult and their experience affected their likelihood to request staffing grants. Providing technical assistance to recipients with less experience and limited staff may help ensure that they are able to design custom projects that qualify for incentives.

### **Program Ally Participation**

To understand the context in which participating contractors interact with the program and market their services, we asked respondents whether the majority of the services they provide relate to preventative maintenance or fix on failure. In general, we found an even split between those performing each type of work.

**Table 11. Description of Contractor Services**

Most of the services your company provides are...?	Percent of Contractors (n=49)
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Most of the services your company provides are...?	Percent of Contractors (n=49)
Preventative maintenance	51%
Fix on failure	49%

The team also found that registered and non-registered contractors employ a similar set of promotional strategies, the most prevalent of which are customer referrals and word of mouth advertising. However, registered contractors are more than twice as likely as non-registered contractors to use online advertising (66% and 21%, respectively). This finding suggests that registered contractors have different strategies and interests when it comes to marketing their services and the ActOnEnergy program. Furthermore, while some registered contractors may have a clear desire to take advantage of co-branding opportunities, for example, this benefit may not be a critical factor for all contractors.

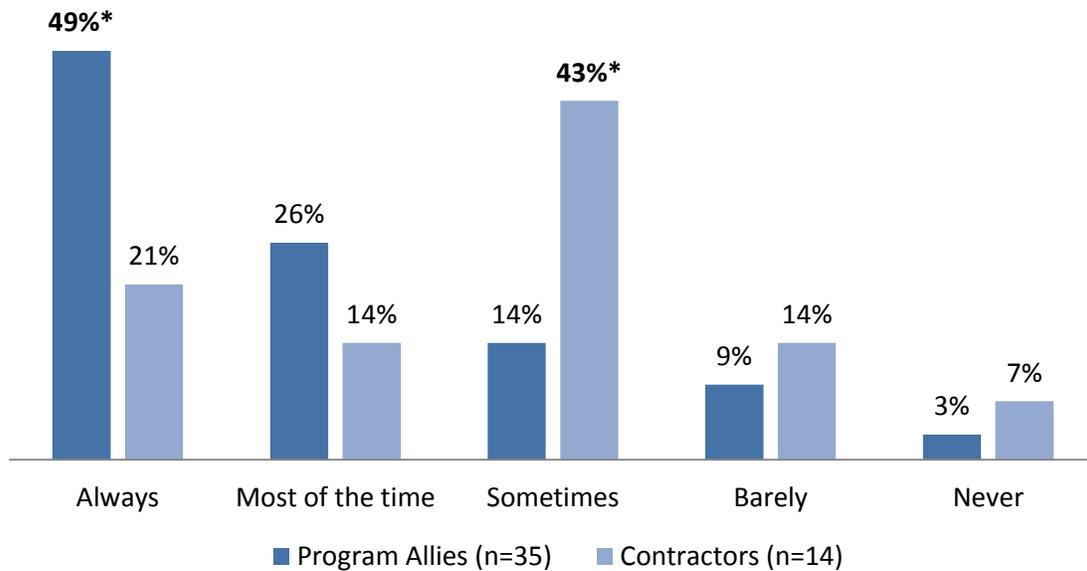
**Table 12. Participating Contractor Promotional Strategies (Multiple Response)**

Promotional Strategies	Registered Contractors (n=35)	Non-Registered Contractors (n=14)
Customer Referrals	91%	100%
Word of Mouth	91%	86%
Online Advertising	66%*	21%
Print Advertising	46%	29%

\* Indicates significance at 90% confidence level.

In terms of the frequency with which program marketing takes place, within the past six months, 63% of all participating contractors report promoting the program either “always” or “most of the time.” Registered contractors are also much more likely than non-registered contractors to promote the ActOnEnergy program. As shown in Figure 5, almost half of the registered contractors we interviewed promoted the program all of the time, whereas the greatest share of non-registered contractors (43%) promoted the program some of the time.

Figure 5. Frequency of Program Promotion in the Past 6 Months



\* Indicates significance at 90% confidence level.

Additionally, contractors perceive moderate levels of program awareness. In particular, most contractors (69%) report that their customers are “somewhat aware” of the program, while 20% report that their customers are “very aware.”

Table 13. Customer Awareness of the ActOnEnergy Program

Awareness	All Contractors (n=49)
Very aware	20%
Somewhat aware	69%
Not at all aware	10%

In an effort to assess the degree to which registered contractors leverage AIC marketing materials and co-branding opportunities, the team asked about their receipt and use of program materials, as well as their value in marketing the program.

Overall, less than half (46%) of registered contractors reported that they had received some marketing materials from the program. Among those who did receive materials, 29% received print materials, 11% received online materials, and 9% received some other type of marketing material. In addition, over two-thirds (69%) of those who received marketing materials used them to promote the program, and of those who used them, the majority (64%) found them to be useful (a rating of 8-10 on a scale from 0 to 10 where 0 is “Not useful at all” and 10 is “very useful.”

**Table 14. Usefulness of Program Marketing Materials among Those Using Them**

Usefulness of Program Marketing Materials	Mean Rating
Registered contractors using materials (n=11)	7.5

Note: Scale from 0 to 10 where 0 is “Not useful at all” and 10 is “very useful.”

While we also attempted to gather feedback on the availability of co-branding opportunities, only a small number of registered contractor respondents had produced co-branded materials (n=5). However, three of the five respondents rated the importance of co-branding to their company’s marketing efforts a 10 on a scale from 0 to 10 where 0 is “not at all important” and 10 is “very important.”

Registered contractors reported making a few changes to their marketing practices as a result of becoming an ally. One-fifth (20%) verbally recommended the program to their customers, 14% said they used the program logo on print marketing materials, and 9% said that they performed co-branding or advertising with affiliated businesses.

**Benefits of Membership in the Program Ally Network**

Program allies identified the ability to offer customers incentives and rebates as the greatest benefit of registering as an ally (cited by 26% of program allies). Other perceived benefits include that being registered with the program increases the legitimacy of the contractor’s business (23%), that the contractor’s status as a program ally can be used as a selling point with customers (17%), and that there is increased visibility that results from partnering with AIC and being listed on their website (14%).

**Table 15. Main Benefits of Program Ally Participation**

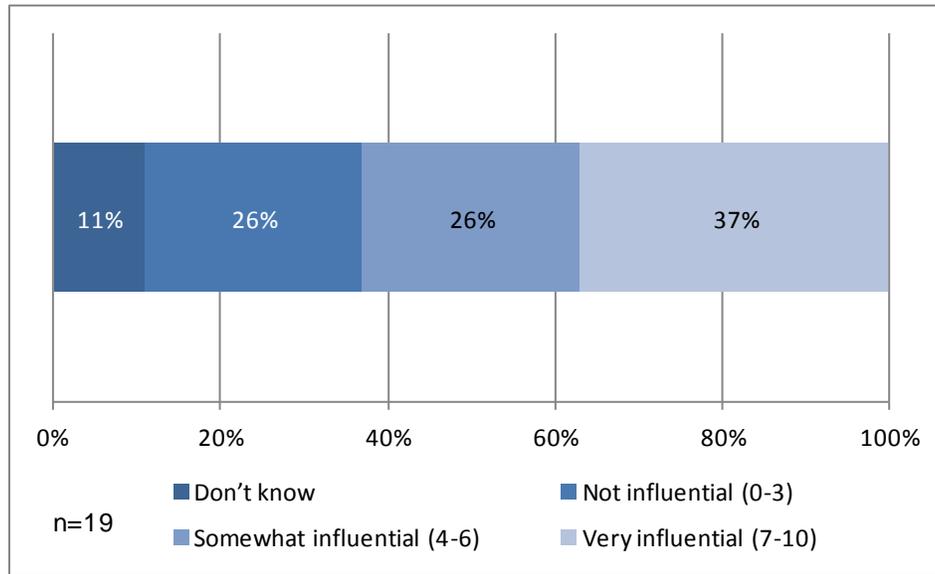
Benefit	Percentage of Program Allies (n=35)
Able to offer customers incentives/rebates	26%
Increases legitimacy/credibility of business	23%
Selling point with potential clients/increased sales	17%
Association with Ameren/listed on program website	14%
Getting updates on latest rebate/program opportunities	14%
Able to offer customers EE equipment/save them energy	11%
Opportunities for new business	9%
Shows social responsibility/helping the environment	9%

The team also asked registered program allies which of the services provided by the program are of least value to them. While 14% of respondents said all of the services had value, program-sponsored roundtables ranked highest in the list of least valuable program services (cited by 21% of allies), followed by email blasts (18%) and webinars (15%).

In general, respondents were knowledgeable of the bonus offers initiated by the program in PY4. For example, almost three quarters of all respondents (71%) were aware of the bonus offers. However,

eligible program allies had mixed opinions on how much the bonus offer influenced the number of projects they submitted in PY4. As shown in the table below, just over a third thought that it was very influential (37%), while just under a third thought it was somewhat influential (26%) or not influential (26%). The overall mean rating was 5.4. These ratings may reflect the fact that many bonus offers were linked to specific program measures or offerings that not all allies would be exposed to or involved in.

**Figure 6. Impact of Program Ally Bonus Offers**



Note: Scale is from 0 to 10 where 0 is "Not influential at all" and 10 is "very influential."

### Program Ally and Contractor Satisfaction

Overall, participating contractors are satisfied with the program. As shown in Table 16, satisfaction with the application process was slightly higher among non-registered contractors (mean score of 7.4 vs. 6.0 for registered contractors) and the highest satisfaction score was for communication with ActOnEnergy program staff (8.1 for registered contractors and 8.6 for non-registered contractors).

**Table 16. Participating Contractor Mean Satisfaction Scores**

Program Component	Overall Mean Score (n=49)	Registered Contractors (n=35)	Non-Registered Contractors (n=14)
Communication with ActOnEnergy Staff	8.2	8.1	8.6
The measures offered	7.9	7.8	8.1
The incentive amounts	7.7	7.5	8.0
The ActOnEnergy Program in general	7.6	7.5	8.1
The application process	6.5	6.0	7.4*

Note: Scale is from 0 to 10 where 0 is "very dissatisfied" and 10 is "very satisfied."

\* Indicates that contractor mean is significantly higher than registered program ally mean at 90%

confidence level.

We followed up with respondents who indicated that they were dissatisfied with the program in general. Dissatisfaction with the program was mainly attributed to the application process being too long, complicated, or unclear (cited by 10 of the 16 contractors who indicated dissatisfaction with some element of the program).<sup>10</sup> Some program allies and contractors also felt that they lacked access to updated or accurate information about the program (25%), and one quarter (25%) of those who were dissatisfied felt that the incentives should be higher. Finally, a small percentage (19%) felt that it was difficult to get assistance from AIC.

Some of these areas of dissatisfaction are also reflected in suggestions for program improvement. For example, as shown in Table 17, 20% of contractor respondents recommended that the program simplify the application process or offer an online application. A small percentage (12%) suggested that AIC improve communication despite the fact that this component of the program received the highest satisfaction ratings.

**Table 17. Contractor Recommendations for Program Improvement**

Recommendations	All Respondents (n=49)
Simplify application process/allow online applications	20%
Improve AIC communication/customer support	12%
Reduce or change program requirements	12%
Provide more accurate program information/estimates	12%
Higher incentives rebates	10%
More program advertising	10%

### **Barriers to Customer Participation**

Most participating contractors (73%) report that their customers are “somewhat aware” of the option to make their facilities more energy efficient, while 22% reported that their customers are “very aware” and 4% reported that they are “not at all aware.”

**Table 18. Customer Awareness of Energy Efficiency Options**

Awareness	All Respondents (n=49)
Very aware	22%
Somewhat aware	73%
Not at all aware	4%

The greatest barrier that participating contractors face in encouraging customer participation is related to customer budget constraints, although non-registered contractors are more likely than registered

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<sup>10</sup> The team understands that AIC has modified the application in PY5 and is working towards providing an auto-submit feature.

contractors to report this as a barrier to their customers’ participation (86% vs. 57%). A lack of upfront capital and a minimum required return on investment also posed significant barriers for non-registered contractor customers. Some non-registered contractors suggested that the best way to overcome these barriers would be through offering financing options to reduce the upfront capital needed for a project, or by offering a higher incentive. However, due to legislative and regulatory orders, AIC is unable to offer financing to business customers.

**Table 19. Contractor Perceived Barriers to Customer Participation**

Perceived Barriers to Customer Participation	Percent of all Respondents (n=49)	Registered Contractors (n=35)	Non-Registered Contractors (n=14)
Budget constraints	65%	57%	86%*
Lack of upfront capital for projects	54%	54%	57%
Minimum return on investment	37%	37%	29%
Awareness of programs	31%	26%	43%
Financial viability of the project	27%	29%	21%
Customer staffing issues	8%	9%	7%
Energy efficiency not a high priority	4%	6%	-

\* Indicates that contractor percentage is significantly higher than registered program ally percentage at 90% confidence level.

### **Program Influence of Contractor Business Practices**

Overall, contractor respondents indicate that the ActOnEnergy Business Program is having a positive effect on their sales of energy efficient equipment. More than half of respondents (59%) report that their businesses’ sales of energy efficient equipment have increased in the past 12 months. When asked how important the ActOnEnergy program was in this increase (as compared to the importance of other factors such as tax credits, government rebates, or changes in codes and standards), respondents rated the importance of the ActOnEnergy program higher than these other factors (mean importance rating of 7.6 and 5.7, respectively).

**Table 20. Program Influence on Changes in Energy Efficient Equipment Sales**

Contractors	Percentage reporting an increase	Mean Program Importance	Mean Importance of Other Factors*
Registered (n=35)	63%	7.6	5.4
Non-Registered (n=14)	50%	7.7	6.4
<b>All Respondents (n=49)</b>	<b>59%</b>	<b>7.6</b>	<b>5.7</b>

Note: Mean influence scores on a scale from 0 to 10 where 0 is “not at all important” and 10 is “very important.”  
 \*Other factors could include tax credits, government rebates, changes in codes and standards, and a greater awareness of energy efficiency in general, etc.

Most program allies also reported that the program had an effect on their business more generally. Most commonly, program allies reported that they focused their marketing efforts on energy efficiency (57%). Almost a third (29%) thought the program had an effect on the type of equipment they sold. Although very few opened new offices (3%), a few (14%) were able to hire new staff as a result of the

program.

**Table 21. Program Impacts on Program Ally Business Practices**

<b>Impact on Program Ally</b>	<b>Percentage of Program Allies (n=35)</b>
Focused marketing on energy efficiency	57%
Changed the type of equipment sold	29%
Hired more staff	14%
Opened new offices	3%

## **4.2 IMPACT RESULTS**

We verified program participation and gross impacts through on-site visits with a sample of participating customers. The results of the visits are presented throughout this section.

### **4.2.1 VERIFICATION AND GROSS IMPACTS**

For the Custom Program, we perform site-specific M&V that leads to the development of a gross realization rate that is applied to the population of all projects in the program.

#### **Site-Specific Results**

The table below presents the results of the gross savings analysis for the 45 Custom sites in our sample.<sup>11</sup> It is important to note that individual projects had realization rates ranging from zero to approximately 300% for electric and 12% to 170% for gas (see Table 22).

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<sup>11</sup> Detailed site visit reports from 10 of the largest Custom projects are included in Appendix C.

Table 22. 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
400129	1	1	2	13,199	0	3	13,693		112%	104%	N/A
400385	1	1	5	41,010	11,601	2	17,872	19,226	46%	44%	166%
401449	1	1	2	790	0	-	327	-	0%	41%	N/A
400017	1	2	33	200,094	0	45	274,669	-	134%	137%	N/A
400018	1	2	34	205,344	0	43	282,558	-	126%	138%	N/A
400031	1	2	-	403,690	0	-	114,879	-	N/A	28%	N/A
400036	1	2	-	156,840	0	-	103,904	-	N/A	66%	N/A
400045	1	2	26	211,600	0	(8)	(33,114)	-	-31%	-16%	N/A
400118	1	2	38	337,402	0	11	106,113	-	28%	31%	N/A
400182	1	2	15	130,988	0	3	29,242		22%	22%	N/A
400252	1	2	14	128,911	0	12	102,270	-	85%	79%	N/A
400001	1	3	659	5,771,516	0	740	6,483,967	-	112%	112%	N/A
400012	1	3	693	4,863,013		478	2,020,999	-	69%	42%	N/A
400020	1	3	198	1,744,786	0	-	198,673	-	0%	11%	N/A
400415	1	3	608	5,330,162	0	608	5,329,015	-	100%	100%	N/A
400273	2	1	3	11,130		-	11,607	-	0%	104%	N/A
400585	2	1	-	105,280	-	1	7,918	-	N/A	8%	N/A
400781	2	1	14	67,522	-	5	22,213	-	33%	33%	N/A
400930	2	1	26	224,133	9,082	76	159,221	9,523	298%	71%	105%
401142	2	1	-	24,664	-	-	30,093	-	N/A	122%	N/A
401465	2	1	27	237,832	-	28	239,422	-	103%	101%	N/A
401472	2	1	14	120,400	-	32	279,900	-	228%	232%	N/A
401711	2	1	2	8,655	-	-	8,655	-	0%	100%	N/A
400007	2	2	-	1,099,106	-	-	2,222,622	-	N/A	202%	N/A
400054	2	2	225	1,969,735	-	237	1,927,177	-	106%	98%	N/A

Results and Findings

ProjectID	Wave	Strata	Ex Ante Savings Claimed			Ex Post Savings			Realization Rate		
			kW	kWH	Therm	kW	kWH	Therm	kW	kWH	Therm
400083	2	2	252	2,171,232	-	142	1,239,980	-	56%	57%	N/A
401381	2	2	434	1,075,886	-	-	1,165,696	-	0%	108%	N/A
401703	2	2	120	1,052,096	-	261	2,286,709	-	218%	217%	N/A
400004	2	3	1,671	8,871,687	-	1,091	5,792,985	-	65%	65%	N/A
400025	2	3	317	1,684,339	-	176	1,103,350	-	56%	66%	N/A
400052	2	3	381	3,328,416	-	262	2,286,148	-	69%	69%	N/A
400792	2	3	61	2,417,967	-	106	1,683,204	-	173%	70%	N/A
401377	2	3	131	1,129,798	-	154	1,346,391	-	118%	119%	N/A
401382	2	3	1,297	11,202,780	-	1,587	12,117,408	-	122%	108%	N/A
401481	2	3	348	3,007,445	-	482	4,165,351	-	139%	139%	N/A
400550	2	N/A	-	-	262,848	(5)	(47,564)	289,519	N/A	N/A	110%
400657	2	N/A	-	-	64,559	-	-	87,585	N/A	N/A	136%
400788	2	N/A	-	-	27,600	14	85,164	25,305	N/A	N/A	92%
400836	2	N/A	-	-	120,769	-	-	94,765	N/A	N/A	78%
401415	2	N/A	-	-	7,879	-	-	8,601	N/A	N/A	109%
400053	2	N/A	-	-	70,242	-	-	107,455	N/A	N/A	153%
400174	2	N/A	-	-	13,078	-	-	1,557	N/A	N/A	12%
400602	2	N/A	-	-	1,877	-	-	1,426	N/A	N/A	76%
400058	2	N/A	31	267,679	43,996	4	9,622	15,863	13%	4%	36%
401114	2	N/A	3	23,978	2,170	3	39,192	3,649	114%	163%	168%
<b>TOTAL</b>			<b>7,683.3</b>	<b>59,641,105</b>	<b>635,701</b>	<b>6,590.8</b>	<b>53,227,531</b>	<b>664,474</b>	<b>86%</b>	<b>89%</b>	<b>105%</b>

In addition, the following tables provide results by technology category for electric and gas impacts.

**Table 23. Custom Site Visit Results – Electric and Demand Impacts**

Technology	Qty	kW Savings			kWh Savings		
		Ex Ante	Ex Post	RR	Ex Ante	Ex Post	RR
EMS/Controls	8	89.3	185.9	208%	3,356,552	2,138,411	64%
Lighting	8	909.4	936.0	103%	7,739,109	7,847,701	101%
Compressed Air	8	1,454.7	1,438.2	99%	13,241,082	12,638,466	95%
Pumps/Fans	5	1,789.6	2,254.3	126%	16,559,529	20,131,673	122%
Boiler	7	35.3	14.5	41%	308,689	65,095	21%
Miscellaneous	9	3,757.3	1,762.0	47%	18,436,144	10,406,185	56%

**Table 24. Custom Site Visit Results – Gas Impacts**

Technology	Qty	Therm Savings		
		Ex Ante	Ex Post	RR
EMS/Controls	8	13,129	14,598	111%
Lighting	8	0	0	N/A
Compressed Air	8	0	0	N/A
Pumps/Fans	5	0	0	N/A
Boiler	7	544,451	533,821	98%
Miscellaneous	9	78,121	116,056	149%

Within the EMS/Controls category, five of the seven projects that claimed electric savings had realization rates of 71% or less. Several factors contributed to the savings reductions. First, it appeared that many of the projects assumed kW levels of the controlled equipment that were greater than the actual operating demand. Second, the projects tended to overestimate the reduction in hours of operation of the controlled equipment. This was the primary cause for the reduction in savings for the largest project in this category. This project involved the installation of controls to allow the customer’s chilled water plant to switch into free cooling mode when the outdoor air temperature was low enough. The original analysis assumed that the system would be in free cooling mode for 4,400 hour per year. However, based on the supplied customer data, the system was only able to be in free cooling mode less than 3,400 hours per year.

The relatively lower realization rate for the electric savings within the miscellaneous category is based mainly on three projects. Two projects were for electric arc furnaces. For both of these projects, the original savings estimates were based on studies that were completed for other facilities. Based on the data collected for these sites, the improvement in melt efficiency for the furnaces was less than anticipated. It is possible that the lower efficiency was due to the customers not installing the controls for the electric arc furnaces during the original project completion, but instead deferring the controls installation until a later date. The third project involved the installation of a chilled water plant involving two (2) 1,300 ton chillers. The original analysis calculated savings by comparing the kW/ton of the existing chillers to the new efficient chillers. However, it was determined that the project involved the expansion of the chilled water plant. The existing chillers are still used to meet the peak cooling load. Therefore, the verification analysis calculated savings by comparing the installed efficient chillers to code baseline chillers.

The high realization rate for the gas savings within the miscellaneous category is primarily due to one

project. The project involved the installation of recuperative burners on a calciner furnace.<sup>12</sup> Based on the supplied tons melted data and the therm usage data supplied, the recuperative burner improved the efficiency of the furnace more than anticipated.

Based on the site visit results detailed above, the overall Custom Program realization rates are 0.88 for electricity, 0.85 for peak demand, and 1.05 for gas as shown in Table 25.<sup>13</sup> These results reflect the two-wave sample design and are not the result of a simple average.

**Table 25. Overall Custom Gross Realization Rates**

Program	Realization Rate		
	kWh	kW	Therm
Custom	0.88	0.85	1.05

## Overall Program Results

Our impact analysis activities yielded ex post gross kWh and peak kW impact estimates that are lower than ex ante estimates. However, we found ex post therm impacts that exceed ex ante estimates.

**Table 26. Custom Program Gross Impacts**

Program	Projects	Ex Ante Gross			Ex Post Gross			Realization Rate		
		kWh	KW	Therm	kWh	KW	Therm	kWh	KW	Therm
Custom	103	69,048,575	8,988	677,297	60,941,064	7,673	707,954	0.88	0.85	1.05

### 4.2.2 NET IMPACTS

As described in the methodology section, the team applied the PY2 NTGR (0.69 for electric and 0.80 for gas) to Custom Program gross impacts to determine PY4 net impacts for all Custom projects except those completed through the staffing grant. For the 6 staffing grant participants we spoke with, we assigned the NTGR developed through the evaluation process to all Custom projects completed by those participants. In total, this affected 4 of the 6 AIC customers and 14 Custom projects. Overall, the NTGR associated with the PY4 staffing grant recipients and all of their associated projects (not only Custom) was 0.97. Table 27 provides the NTGRs for each project completes by the staffing grant recipients. Please note that only 14 of the 26 projects shown are included in the Custom Program.

**Table 27. PY4 NTG Results for Staffing Grant Recipients**

Project	FINAL NTG
1	1.00
2	1.00
3	1.00

<sup>12</sup> A calcinating furnace is used to melt various minerals or matter to create new materials such as cement.

<sup>13</sup> The relative precision is 3% for kWh and 9% for kW.

Project	FINAL NTG
4	1.00
5	1.00
6	1.00
7	0.86
8	0.76
9	1.00
10	1.00
11	0.95
12	1.00
13	0.78
14	1.00
15	1.00
16	1.00
17	1.00
18	0.76
19	0.75
20	1.00
21	0.76
22	1.00
23	0.76
24	1.00
25	0.89
26	1.00

In determining the overall net savings associated with the Custom Program, the team calculated net savings by project based on either the PY2 electric or gas NTGR, or the PY4 staffing grant NTGR where applicable.<sup>14</sup> Table 28 presents the PY4 net impacts for the Custom Program.

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<sup>14</sup> The team applied the PY2 electric NTGR to projects with gas and electric savings.

**Table 28. Custom Program Net Impacts**

Program	Ex Ante Net Impacts			Ex Ante NTG <sup>a</sup>	Ex Post NTGR <sup>b</sup>	Ex Post Net Impacts		
	MW	MWh	Therms			MW	MWh	Therms
Custom	6.20	47,644	541,838	0.69	0.78	5.98	47,837	561,784
	<i>Net Realization Rate</i>					0.96	1.00	1.04

<sup>a</sup> As stated above, the team applied the AIC ex ante NTG value of 0.8 for gas projects.

<sup>b</sup> The NTGR presented here differs from the 0.69 PY2 Custom NTGR as a result of integrating results from the staffing grant participants. However, in general, the team did apply the PY2 NTG for this program as planned.

To provide additional context around these findings, we summarize the Custom Program NTGRs from prior program years.

**Table 29. Past Custom Program NTGRs**

Program Year	NTGR	Source
PY1	0.77	PY1 Evaluation
PY2	0.69	PY2 Evaluation
PY3	0.75	PY3 Evaluation

Note: Each Plan 1 program year was electric only.

### **4.3 INPUTS FOR FUTURE PROGRAM PLANNING**

The team did not conduct any research in PY4 to inform future program planning. However, we plan to conduct NTG research in PY5 that AIC may use to inform planning for Plan 3.

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## A. APPENDIX: DATA COLLECTION INSTRUMENTS

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The following file contains the staffing grant Interview guide.



Staffing Grant  
Interview Guide FINA



PY4 AIC Program Ally  
Survey FINAL 2012-0

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## B. APPENDIX: IMPLEMENTATION MODEL

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The evaluation team created an implementation model for the Standard and Custom programs evaluated in PY4. An implementation model is a graphic presentation of the intervention—what occurs and who undertakes the functional activities of the program. The model is displayed using a multi-level Visio document that has various functions in its rows, and key stakeholders and populations in the columns. We determined the functions, stakeholders, and processes through a review of the available program documentation and further refined them based on interviews with program staff. This model does not attempt to assess the effects of the program.

The model is organized by function and the stakeholders involved.

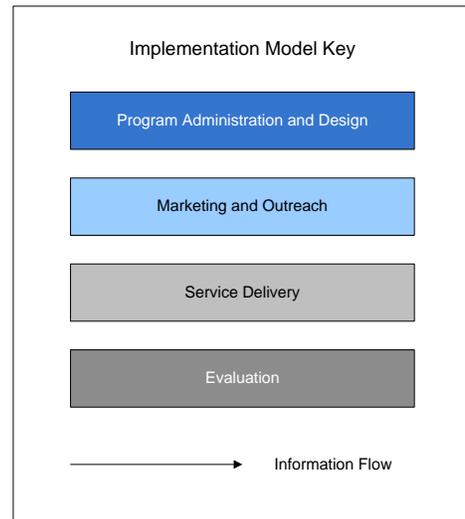
- **Functions:** These represent the discrete functions inherent to the program. These functions include program administration and design, marketing and outreach, service delivery, and evaluation. Service delivery encompasses activities that are directed towards intervention recipients and, for this model, is a catchall for any activity not included in the other functions.
- **Stakeholders:** These include the various entities that are involved in program delivery or receive program services. Stakeholders include the customer, program allies or market actors, AIC, and sub-contractors SAIC and GDS.
- For these programs, we include an additional “application process flow model” that documents a specific aspect of the service delivery processes in greater detail.

For the C&I Standard and Custom programs, key program functions include:

- **Program Administration and Design:** Utility and implementer staff work together to establish the program design, budget, and implementation plan for the Standard and Custom programs. SAIC then takes the lead in developing the application materials and tracking mechanisms required to effectively manage the program. As part of the latter activity, SAIC also works closely with GDS, the developer of the business program database called AIB.
- **Marketing & Outreach:** Both SAIC and AIC are actively involved in marketing the ActOnEnergy program. While SAIC develops the marketing materials and overall strategy, AIC is engaged in the process and works independently to keep internal stakeholders such as the Key Account Executives (KAEs) and Corporate Public Relations (CPR) informed about the program. As part of marketing and outreach efforts, SAIC also recruits market actors to serve as official program allies, and draws upon Energy Advisor staff to meet directly with Ameren customers about program opportunities.
- **Service Delivery:** SAIC is the key actor involved in service delivery and works directly with the customer and/or program ally or contractor involved in the project. As part of this process, SAIC thoroughly reviews all project documentation both at an administrative and technical level to assure that project quality is high and all necessary documentation is provided. This occurs specifically through the pre-approval, in-process, and final application review.

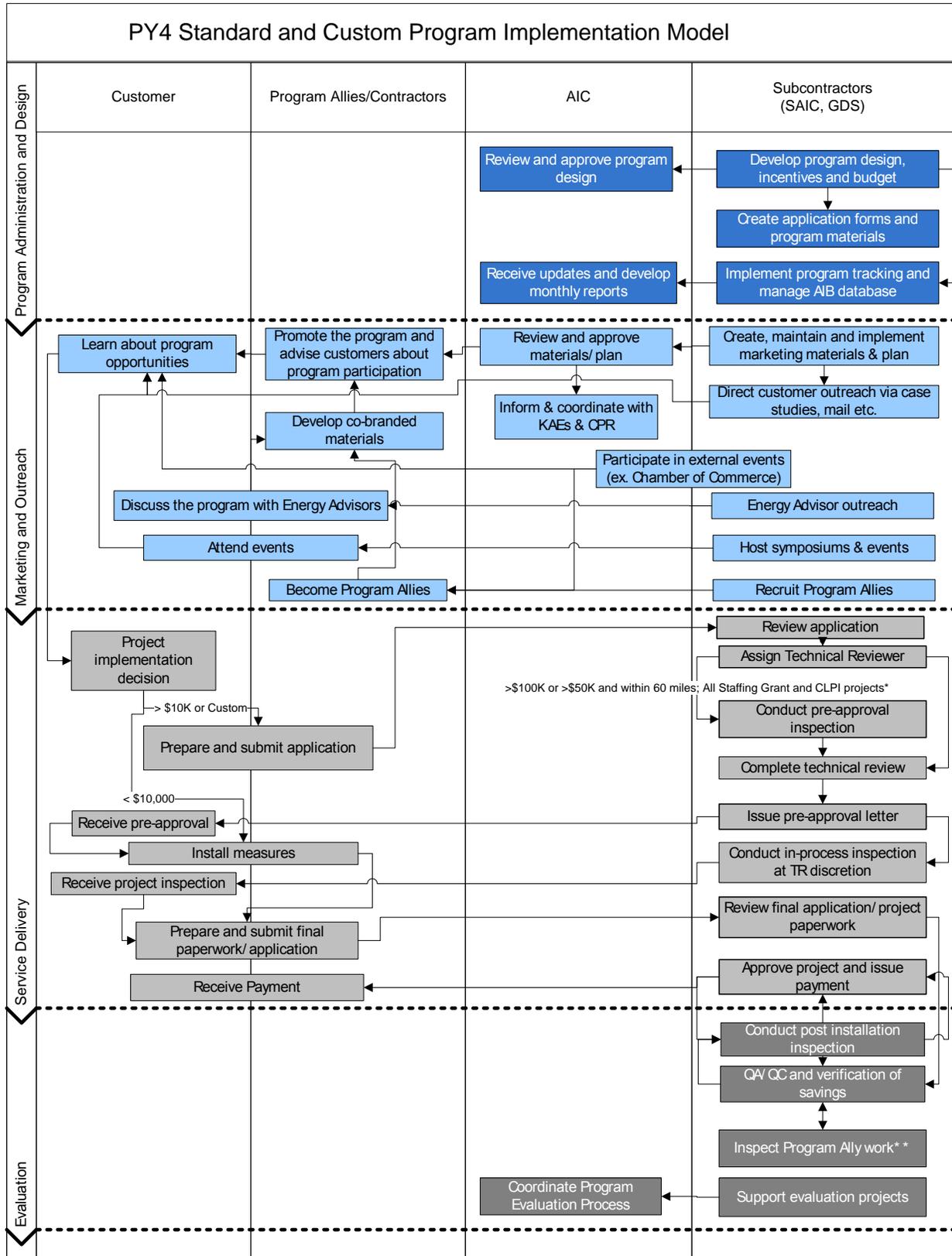
- **Evaluation:** As part of the program’s Quality Assurance and Quality Control (QA/QC) procedures, SAIC conducts post installation inspections<sup>15</sup> of designated projects and also conducts internal verification of project savings via the technical review process. In addition, SAIC actively works to support the third-party evaluation process by providing program data and additional information about key C&I projects. AIC also works to coordinate the evaluation process and ensure that both program staff and the evaluation team are on the same page.

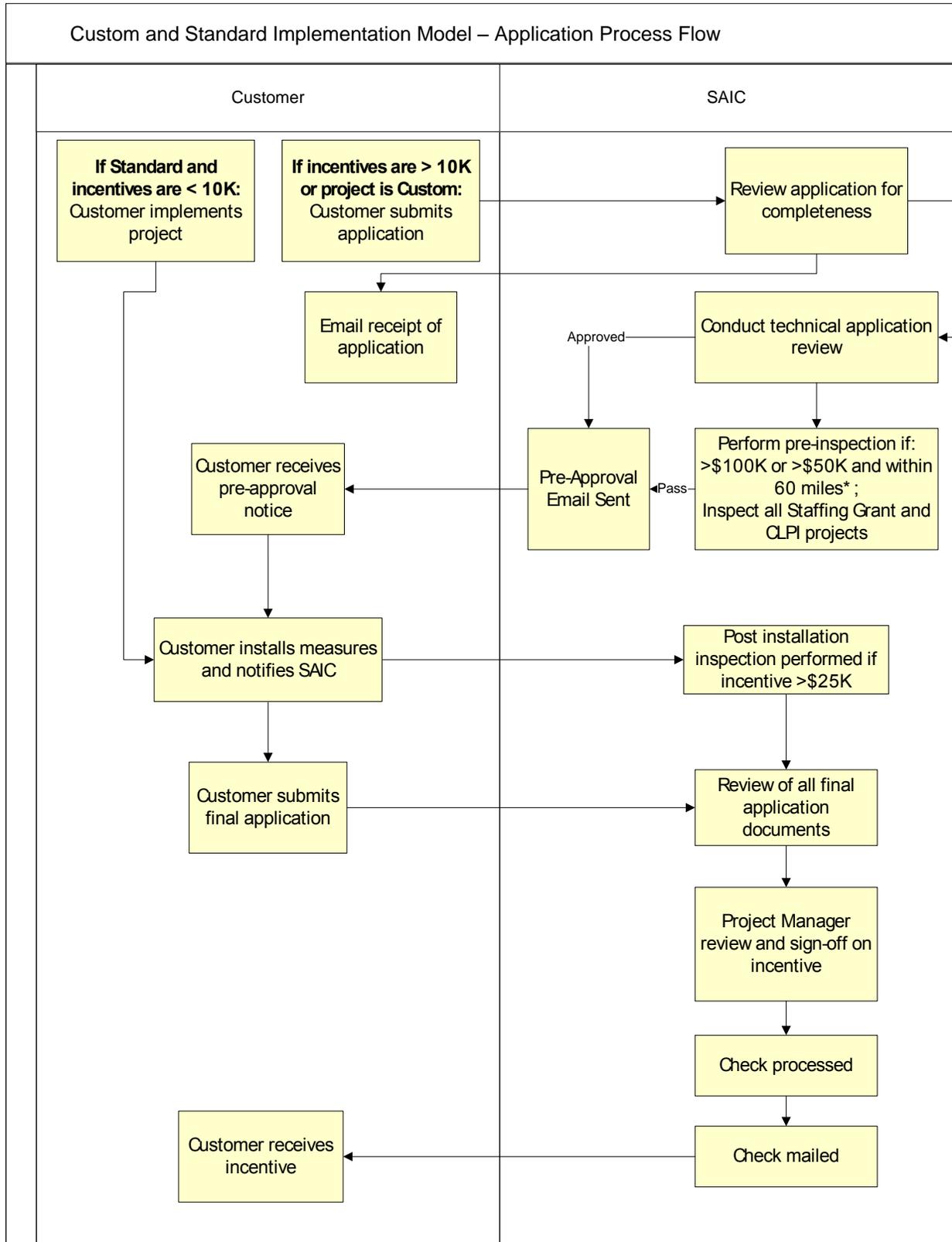
Below we provide the Custom Program implementation model.



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<sup>15</sup> Post-installation inspections are required for projects requesting incentives of more than \$25,000.





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## C. APPENDIX: SITE VISIT REPORTS

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Appendix C\_AIC  
Custom Site Visit Resu