Opinion Dynamics

Boston | Headquarters

617 492 1400 tel
617 497 7944 fax
800 966 1254 toll free

1000 Winter St
Waltham, MA 02451

Impact and Process Evaluation of 2013 (PY6) Ameren Illinois Company Commercial & Industrial Standard Efficiency Program

Final

March 6, 2015

CADMUS

NAVIGANT

MichaelsEnergy

Contributors

Jake Millette
Project Manager, Opinion Dynamics

Zach Ross
Senior Analyst, Opinion Dynamics

Matt Drury
Senior Energy Engineer, Opinion Dynamics

Mike Frischmann
Managing Engineer, Michaels Energy

Table of Contents

Table of Tables

Table of Figures

1. Executive Summary

This report presents the results of Opinion Dynamics' evaluation of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Standard Program for electric and gas energy efficiency. It covers the program's performance in program year 6 (PY6), which ran from June 1, 2013, through May 31, 2014. AIC expected this program to account for 17% of the savings from its portfolio of electric savings programs and 29% of the savings, in therms, from its gas savings programs.[1] The Standard Program's savings come from the core incentive offering, the online store where customers can buy energy-efficient products at reduced prices, and the Green Nozzle initiative.

Our evaluation of the Standard Program included impact and process assessments. We reviewed program materials and program-tracking data; interviewed program administrators, implementation staff, and participating trade allies; made site visits to assess large lighting projects; and conducted other research. Our quantitative research included a survey of customers who participated in the core program.

Below we present the key findings of the PY6 evaluation.

1.1 Impact Results

Our participant verification activities showed that AIC is accurately tracking the measures installed and operating due to the program. As shown in Table 1-1, the electric and gas gross realization rates for all program components are close to 100%. Table 1-1 also provides the PY6 Standard Program net impacts. As outlined in the evaluation plan, the team applied the PY4 net-to-gross ratios (NTGRs) for all of the program's components in developing estimates of net savings. The PY6 Standard Program achieved 55,332 MWh in net electric savings and 972,082 therms in net gas savings. This level of savings enabled the program to exceed its internal PY6 electric and gas goals.

Table 1-1. Standard Program Impact Summary

Savings Category	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)					
Core Program	64,612	99.7%	64,415	0.65	41,737
Online Store	16,579	100.0%	16,584	0.83	13,764
Green Nozzle	26	100.0%	26	0.92	24
Total MWh	**81,217**	**99.8%**	**81,024**	**0.69**	**55,525**
Demand Savings (MW)					
Core Program	13	99.7%	13	0.63	8
Online Store	3	100.5%	3	0.83	3
Green Nozzle	0	N/A	0	0.92	0
Total MW	**16**	**99.8%**	**16**	**0.67**	**11**
Gas Savings (Therms)					
Core Program	972,806	99.8%	971,133	0.98	954,210

[1] Three-Year Evaluation Plan for the Ameren Electric & Gas Residential and Commercial Portfolios, PY4-PY6

Online Store	0	N/A	0	N/A	0
Green Nozzle	9,424	100.0%	9,424	0.89	8,387
SBDI (Gas only)*	0	N/A	10,176	0.90	9,158
Big Bonus (Gas only)*	892	0.48	430	0.76	327
Total Therms	**983,122**	**100.8%**	**991,163**	**0.98**	**972,082**

* Gas savings from two small business program offerings made through the Illinois Power Agency, but supported with 8-104 funds to allow for the provision of a small amount of gas-saving measures, are claimed here. See Appendix C for details.

1.2 Process Results

In PY6, the Standard Program completed a highly successful year in terms of participant satisfaction while meeting its savings goals. Now in its sixth year, the program is relatively mature, and its implementation remains relatively stable. AIC made minor adjustments to the program's design and implementation in PY6 to ensure the program received a pool of quality projects to draw from, and the utility improved its program data tracking systems in preparation for the launch of a new application system in PY7.

AIC continued to receive overwhelmingly positive customer feedback on the program. Since its inception, the program has seen high levels of participant satisfaction in nearly all program areas—from program paperwork, to processing incentives, to addressing customer questions and concerns. PY6 continued this trend, with 95% of participants reporting overall satisfaction[2] with the program and all defined program areas examined in our evaluation receiving high marks from participants. Consistently performing at this level has likely helped ensure that participants continue to return to the program year after year.

Nevertheless, our evaluation was able to identify some areas in which the program could improve. Our recommendations for the program are as follows:

- **Explore restructuring the AweSummer bonus offering.** Most program allies reported that that the AweSummer bonus, intended to encourage projects to enter the program early, did not markedly speed the progress of any of their projects. Instead, projects already in the pipeline received an unexpected bonus from the program. Half of the participants interviewed who had received an AweSummer bonus indicated they would have been just as likely to install the same project without the bonus. While the program is meeting its goals, restructuring or eliminating the AweSummer bonus offering could help it attain more savings with the same level of program expenditure.

- **Encourage Energy Advisors and other program staff to fully leverage the features of Amplify, the new program-tracking database[3].** Energy Advisors strongly believe the customer lead tracking features built into Amplify will be very useful in conducting customer outreach, but they indicate that the database is not being used to its full potential. AIC should consider working with program staff, implementers, and Energy Advisors to increase the customer contact information entered into Amplify to improve the usefulness of its lead tracking capabilities so they can take greater advantage of the new system.

[2] A score of 7, 8, 9, or 10 on a scale of 0 to 10, where 0 means not at all satisfied and 10 means very satisfied.

[3] In addition to dedicated program marketing, technical review, and call center staff, the ActOnEnergy Business Program has seven regional Energy Advisors who market and support energy efficiency projects to AIC commercial and industrial customers. Energy Advisors focus on helping customers identify and address opportunities for energy efficiency through participation in the Standard, Custom, and Retro-Commissioning programs.

- **Fine tune the information collected in the application and program-tracking database.** Although the program achieved a gross realization rate of nearly 100%, we found some minor data discrepancies in the course of our engineering review. We recommend ensuring that the database matches exactly what is on the application forms; shifting to an online application as planned should minimize any transcription errors.

2. Introduction

This report presents the results of Opinion Dynamics' performance evaluation of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Standard Program during its sixth program year (PY6). The Standard Program is one of three in AIC's C&I portfolio, which also includes the Custom and the Retro-Commissioning programs. PY6 ran from June 1, 2013, through May 31, 2014.

To support our evaluation, we reviewed program materials and program-tracking data; interviewed program administrators, implementation staff, Energy Advisors, and trade allies; and conducted site visits to assess the installation of lighting measures. We also conducted a quantitative telephone survey of customers who participated in the Core Program.

2.1 Program Description

The Standard Program offers AIC business customers fixed incentives for the installation of specific energy efficiency measures. The Core Program covers lighting, variable frequency drives (VFDs), HVAC equipment, refrigeration/grocery equipment, commercial kitchen equipment, steam traps, and other measures.

The program's online store, available to all electric business customers, offers a variety of energy-saving products, including compact fluorescent lights (CFLs), LEDs, and occupancy sensors. The program also continued its Green Nozzle initiative in PY6, but on a smaller scale than in previous years. Through this initiative, AIC offers free "green" nozzles to its gas customers and its customers in the food service sector who use electric or natural gas water heating. The goal of this effort is to replace inefficient nozzles with low-flow nozzles to reduce energy use associated with water heating.

2.2 Research Objectives

The objective of the PY6 Standard Program evaluation was to estimate the gross and net electric, demand, and gas savings associated with the program. We also assessed program changes made in PY6 to improve customer participation. The PY6 impact evaluation sought to answer the following questions:

1. What are the estimated gross energy and demand impacts from this program?
2. What are the estimated net energy and demand impacts from this program?

The evaluation team also explored process-related research questions that focused on the changes in application design and on process improvements made from PY5 to PY6.

1. Program Participation
    a. What are the characteristics of participating customers? How many projects were completed? By how many different customers? What types of projects?
    b. Does customer participation meet expectations? If not, how different is it and why?
2. Program Design and Implementation
    a. Has the program, as implemented, changed compared to PY5? If so, how, why, and was this an advantageous change?

b. What implementation challenges have occurred in PY6, and how have they been overcome?

c. How well does coordination between Energy Advisors and Key Account Executives work? Are Energy Advisors successful in bringing projects into the program?

d. Are customers using the Act on Energy website? Does the design meet the needs of customers and program participants? How could the website be improved?

3. Participant Experience and Satisfaction

   a. How satisfied are participating customers with different aspects of their participation in the program?

   b. How satisfied are program allies with their participation in the program?

   c. How successful were the enhancements to the standard lighting applications in facilitating participation? How satisfied are customers and program allies with the new forms?

   d. How important was the front-load bonus in the timing of participation?

   e. How do participants become aware of the program?

4. Opportunities for Program Improvement

   a. What changes could the program make to improve the customer experience and generate greater energy savings?

3. Evaluation Methods

The assessment of AIC's C&I Standard Program in PY6 consisted of a program process assessment and an evaluation of program impacts. We applied the NTGR from PY4 since the program's implementation and NTGR have remained consistent over the past three program years. Table 3-1 summarizes the PY6 evaluation activities conducted for the Standard Program's assessment.

Table 3-1. PY6 Standard Program Evaluation Activities

Activity	PY6 Process	PY6 Impact	Forward Looking	Details
Program Staff In-Depth Interviews	✓			Provides insight into program design and processes
Participant Survey	✓	✓	✓	Gathers data on program processes and verifies installation of equipment
Program Ally In-Depth Interviews	✓		✓	Provides insight into program processes
Energy Advisor Interviews	✓		✓	Provides insight into program processes
Onsite Verification		✓		Confirms lighting measures installed through the program
Engineering Review		✓		Estimates gross impacts through a review of the program-tracking database and verification of Statewide TRM deemed values.
Net Impact Analysis		✓		Estimates net impacts using PY4 NTGR values and applies to both the gas and electric savings

3.1 Data Collection

The following activities informed the PY6 evaluation of the Standard Program.

3.1.1 Program Staff Interviews

The evaluation team conducted three in-depth interviews: one with program database staff, one with program marketing staff, and one with Leidos, the main program implementation team. The interviews focused on changes to the C&I Standard Program between PY5 and PY6.

3.1.2 Review of Program Materials and Data

We conducted a comprehensive review of all program materials, including the program's implementation plan and applications, as well as extracts from the program-tracking database. We received the extracts in January 2014 for use in evaluation planning and survey sampling. We received updated data in May 2014 and again in July and August 2014 as program implementers finalized the PY6 database.

3.1.3 Participant Telephone Survey

The evaluation team conducted telephone interviews with customers who participated in the Core Program in PY6. These interviews focused on installation verification and program processes. We selected the sample of core participant projects from the AIC tracking system extract from July 8, 2014.

We developed the sample for the Core Program participant survey based on a customer's measured end use. We conducted the sampling at the level of the project contact, rather than the project, because, as in previous program years, many customers completed more than one project in PY6. These businesses generally submitted the same contact name for different projects. To avoid respondent burden, we asked each contact about only one project. The team formed a sample frame of 531 unique customer contacts for the Standard survey.[4]

Since some of the questions in the survey were specific to projects, each contact with multiple projects was questioned about a single project. If a contact had more than one project of with the same end use (e.g., HVAC), we typically chose a project at random on which to focus. The only exception was when a contact had multiple lighting projects and one had been chosen for a site visit; in that case, the contact was asked about a project that was not the subject of a site visit. If a contact had projects with different end uses (including lighting), we asked about the largest non-lighting project. This approach was intended to ensure that our sample would include a sufficient number of non-lighting projects, since lighting continued to be the predominant end use in PY6.

As in prior years, due to the high number of lighting projects completed through the Standard Program, we divided the sample frame into lighting and non-lighting components. We conducted a census attempt of non-lighting projects and drew a random sample of lighting projects. The following table presents the population values and survey information for the Core Program.

Table 3-2. Completed Core Program Survey Points

Interviewees	Sample Frame [a,b]				Completed Surveys (All)			
	Unique Customers	Associated Projects	MWh Savings	Therm Savings	Unique Customers	Associated Projects	MWh Savings	Therm Savings
Lighting	394	553	33,090	0	60	60	3,102	0
Non-Lighting	137	189	15,131	163,305	40	40	2,148	43,313
Total	531	742	48,221	163,305	100	100	5,250	43,313

[a] The total number of projects listed reflects the population in Amplify as of July 8, 2014. This includes projects with a status of "check cut" or "check queued."

[b] The "associated projects" and savings fields under "Sample Frame" represent all projects and savings associated with the 531 unique contacts in our sample frame, including contacts with multiple projects. As described above, we chose a single project for each contact in order to focus our survey questions.

Survey Dispositions and Response Rate

We fielded the survey of Core Program participants from August 7 through September 1, 2014. Table 3-3 provides the final survey dispositions.

[4] The evaluation team also removed any participants who received a staffing grant in PY6, received a Big Bonus, completed a retro commissioning project, or also completed a Custom project. Given the limited samples sizes for efforts to evaluate these programs, we chose to attempt to interview these participants as part of efforts related to those other programs.

Table 3-3. Core Program Survey Dispositions

Disposition	N
Completed Interviews (I)	100
Eligible Non-Interviews	194
Refusal (R)	62
Mid-Interview terminate (R)	3
Respondent never available (NC)	80
Answering device (NC)	48
Language Problem (NC)	1
Not Eligible (e)	25
Fax/Data Line	3
Non-Working	8
Wrong Number	6
Business or other ineligible organization	1
Quota filled	1
No Eligible Respondent	6
Unknown Eligibility Non-Interview (U)	212
Not dialed/worked	198
No Answer	14
Total Participants in Sample	**531**

The following table provides the response and cooperation rates. Appendix B provides information on the methodology used to calculate response rates for telephone surveys.

Table 3-4. Core Program Survey Response and Cooperation Rates

AAPOR Rate	Percentage
Response Rate	20%
Cooperation Rate	61%

The team compared survey respondents with those who did not respond to the survey in order to assess the potential for non-response bias. We found no evidence to suggest that non-respondents differed significantly from respondents in terms of number of projects, project savings, or type of business (see Section 3.3 for additional information on potential sources of error).

Weighting

The team developed and applied the following survey weights for the process analysis.

Table 3-5. Sample Weights for Core Program Participant Survey

Project Type	Sample Frame		Completes		Weight
	Total Part.	% Part.	Total Part.	% Part.	Weight
Lighting	394	74%	60	60%	1.2366
Non-Lighting	137	26%	40	40%	0.6450
Total	531	100%	100	100%	

3.1.4 Energy Advisor Interviews

The evaluation team conducted in-depth interviews with five Energy Advisors active in PY6. The program had seven active Energy Advisors in PY6 and we attempted to interview the six who were still active in the program. The interviews focused on Energy Advisors' perceptions of customer interest in the program, interactions with customers, program processes for coordination between the Energy Advisors and Key Account Executives, and suggestions for program improvement.

3.1.5 Program Ally Interviews

The evaluation team conducted in-depth interviews with 12 program allies active in PY6. The program allies targeted for interviews accounted for the largest shares of completed projects. Interviews focused on program participation processes, program ally satisfaction, barriers to participation among eligible AIC business customers, and the impact of program participation on the program ally's business and business practices.

3.1.6 On-Site Verification

The evaluation team selected a sample of 40 large lighting projects for on-site verification.[5] The sample was drawn from all 153 lighting projects that had ex ante savings of 80,000 kWh or more. We chose the sample using a stratified random sampling design employing the Dalenius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available visits to the strata. We based the sample on the Amplify database extract provided on July 8, 2014.

The following table summarizes the sample selected and the number of sites we visited.

Table 3-6. Lighting Verification Site Visit Sampling Approach

Sampling Strata	KWh Savings Range	Number of Projects	Site Visits Completed
1	80,000–162,000	96	16
2	162,001–400,000	36	12
3	More than 400,000	21	12
Total		153	40

The final sample design provides statistically valid verification results for large lighting projects with ex ante savings of 80,000 kWh or more at the 90% confidence level +/- 1% on a kWh basis. To calculate 90% relative precision, the team first determined the variance in the sample and then calculated the standard error and confidence interval. The figure below outlines the equations used.

[5] We conducted a phone survey and site visit for one project. In this case, we used the lighting verification information gathered on-site instead of the information provided over the phone.

Figure 3-1. Equations for Calculating Precision for Lighting Verification Visits

$$Stratified\ Ratio\ Estimator = \frac{\sum_{i=1}^{n} w_i\, y_i}{\sum_{i=1}^{n} w_i\, x_i} \qquad \text{Equation 1}$$

$$standard\ error = \frac{1}{\hat{X}}\sqrt{\sum_{i=1}^{n} w_i\,(w_i - 1)\,e_i^2} \qquad \text{Equation 2}$$

$$90\%\ Confidence\ Interval = 1.645 * standard\ error \qquad \text{Equation 3}$$

$$Relative\ Precision = \frac{Confidence\ Interval}{Stratified\ Ratio\ Estimator} \qquad \text{Equation 4}$$

Where:

w = case weights for each stratum h (N_h/n_h)
y = ex post savings
x = ex ante savings
$e = y_i - b\,x_i$
$\hat{X} = w_i\,x_i$

3.2 Analytical Methods

3.2.1 Gross Impacts

To estimate PY6 ex post gross savings, we used a combination of the application of the Statewide Technical Reference Manual (TRM) version 2.0, engineering reviews, and on-site verification visits. The following table summarizes the approach used for each component of the Standard Program.[6]

Table 3-7. Standard Program Gross Impact Methods by Component

Program Component	Application of TRM Savings Values	Engineering Review	On-Site Visits
Core Program	X	X	X
Online Store	X		
Green Nozzle	X		

The following sections provide additional details about each of the methods employed.

Engineering Review and Application of Deemed Savings

To determine gross impacts associated with the Core Program, we reviewed the program-tracking database and verified the correct application of the Statewide TRM version 2.0. To conduct the engineering review we:

1. Verified measures in the application database with individual measure-specific databases.

[6] We outline the methodology for estimating impacts from the SBDI and Big Bonus programs in their respective reports.

2. Used algorithms and values from the Illinois TRM version 2.0 to estimate ex post savings as applicable.

3. Reviewed spreadsheets from the program implementer that calculate ex ante savings and compared the calculated values in the spreadsheets with the TRM algorithms.

4. Filled in the missing parameters for approximately 5% to 10% of projects in the database to calculate ex post savings. For example, we looked up efficiencies and capacities of equipment using model numbers or found the parameters using applications and project documentation in Amplify.

5. Revised inputs to measures using the measure-verification data from the participant telephone survey. These changes affected the lighting calculations only and resulted in relatively minor changes.

On-Site Verification Visits

The evaluation team verified in person the installation of lighting measures at a sample of 40 Core Program sites. We chose to conduct these on-site visits because of the large number of measures installed and the difficulty of verifying details of those projects over the phone. The team confirmed that the installed measures, for which program participants received an incentive payment, are still installed and functioning and that the quantity is consistent with the number of measures in the program tracking database.

Green Nozzle

The team verified participation in the Green Nozzle initiative by examining the program-tracking database to ensure not only customer eligibility but also that the measures were all provided within the program year. We then calculated gross impacts based on the Statewide TRM.

Online Store

The evaluation team used several methods to verify the gross impacts of the online store. First, we reviewed the algorithms provided by the implementer for both the online store purchases and the free online store kits and compared them to the TRM inputs. Second, we performed an ex post analysis using the same methodology and raw data from the program-tracking database.

3.2.2 Net Impacts

The team applied to the gas and electric programs the NTGR from PY4. Table 3-8 summarizes the NTGRs used in the net impact analysis. Applying the NTGRs to the Core Program measures listed below resulted in an overall PY6 Core Program NTGR of 0.65 for kWh, 0.63 for kW, and 0.98 for therms.

Table 3-8. NTGR from PY4 Used for PY6

Measure Type	Electric NTGR	Gas NTGR
Lighting	0.62	N/A
HVAC	0.43	0.80
Motor/Variable Frequency Drive	0.80	N/A
Refrigeration (Specialty)	0.83	N/A
Kitchen (Specialty)	0.54	0.73

Measure Type	Electric NTGR	Gas NTGR
Steam Traps	N/A	1.00
Online Store	0.83	N/A
Green Nozzle	0.92	0.89

3.3 Sources and Mitigation of Error

Table 3-9 provides a summary of possible sources of error associated with the data collection conducted for the Standard Program. We discuss each item in detail below.

Table 3-9. Possible Sources of Error

Research Task	Survey Error		Non-Survey Error
	Sampling Error	Non-Sampling Error	
Participant Survey	• Yes	• Measurement error • Non-response and self-selection bias • Data processing error • External validity	• N/A
Gross Impact Calculations	• N/A	• N/A	• Analysis error
Verification Site Visits	• Yes	• N/A	• Data processing error • Analysis error
Net Impact Calculations	• N/A	• N/A	• Analysis Error

The evaluation team took a number of steps to mitigate potential sources of error throughout the planning and implementation of the PY6 evaluation.

Survey Error

- **Sampling Error**
  - **Participant Survey.** The evaluation team designed the telephone survey sample to achieve 90% confidence and +/-10% relative precision. We surveyed 100 customers out of a population of 531. At the 90% confidence level, we achieved a precision of +/- 7.4% assuming a coefficient of variation of 0.50. The actual precision of each survey question depends on the variance of the responses to each question.
  - **Verification Site Visits.** The evaluation team designed the onsite verification sample to achieve 90% confidence and +/-10% relative precision for lighting projects that saved at least 80,000 kWh. We stratified projects in our sample to more accurately capture variations within projects of different sizes. We made 40 onsite visits out of a sample frame of 153 larger lighting projects. At the 90% confidence level, we achieved a precision of +/- 1%.
- **Non-Sampling Error**
  - **Measurement Error**. The validity and reliability of survey data were addressed through multiple strategies. First, we relied on the evaluation team's experience to create questions that, on their face, appeared to measure the idea or construct that they were intended to measure. We reviewed the questions to ensure that we did not ask double-barreled questions (i.e., questions that ask about two subjects, but allow only one

response) or loaded questions (i.e., questions that are slanted one way or the other). We also checked the overall logical flow of the questions to avoid confusing respondents, which would decrease reliability.

All survey instruments were reviewed by key members of the evaluation team and by AIC and ICC Staff. To determine whether the wording of the questions was clear and unambiguous, we reviewed the pre-test survey data, pre-tested each survey instrument, and monitored the telephone interviews. We also used the pre-tests to assess whether the length of the survey was reasonable, and we shortened the survey as needed.

- **Non-Response and Self-Selection Bias.** Because the response rate for the participant survey was 20%, there is the potential for non-response bias. We attempted to mitigate possible bias by contacting each prospective respondent in the sample at least eight times at different times of day, as appropriate, until we received a firm refusal or filled our quota. Team members also used all available data at their disposal to assess whether evidence of non-response bias exists. For this survey, we compared survey respondents to the population based on business type, number of projects, and project savings. We found no evidence to suggest that non-respondents differed significantly from respondents.

- **Data Processing Error.** The team addressed processing error through interviewer training and quality checks of completed survey data. Before they began interviewing, Opinion Dynamics interviewers underwent rigorous training that included a general overview of the research goals and the intent of the survey instrument. Through survey monitoring, members of the evaluation team also provided guidance on proper coding of survey responses. We also carried out continuous, random monitoring of all telephone interviews and validated at least 10% of every interviewer's work.

- **External Validity.** We addressed external validity (the ability to generalize any findings to the population of interest) through the development of an appropriate research design. During data collection, the evaluation team managed the sample to minimize self-selection bias (i.e., we allowed for multiple attempts at different times of day and exhausted one part of the sample before to moving on to the next).

Non-Survey Error

- Analysis Error

  - **Gross Impact Calculations.** We applied the TRM calculations to the participant data in the tracking database to calculate gross impacts. To minimize data analysis error, all calculations were reviewed by a separate team member to verify their accuracy.

  - **Verification Site Visits.** To minimize data collection error, the verification visits were conducted by trained engineers and technicians familiar with not only the lighting equipment covered by the Standard Program but also the methods for estimating gross impacts.

  - **Net Impact Calculations.** We applied deemed NTGRs to estimated gross impacts to derive the program's net impacts. To minimize analytical errors, all calculations were reviewed by a separate team member to verify their accuracy.

4. Detailed Findings

4.1 Process Findings

The evaluation team's process-related research focused mainly on program awareness, program experience, and barriers to participation and on changes in program implementation between PY5 and PY6 that may have affected these areas. Our results are based on 1) in-depth interviews with program staff, Energy Advisors, and program allies; 2) a review of program data; and 3) a quantitative survey of program participants.

4.1.1 Program Description and Participation

The Standard Program offers AIC business customers fixed incentives for installing specific energy efficiency measures. The Core Program covers lighting, variable frequency drives (VFDs), HVAC equipment, refrigeration/grocery equipment, commercial kitchen equipment, steam traps, and other measures. The program operates a convenient, easy-to-use online store that offers all electric business customers a variety of energy-saving products, including compact fluorescent lights (CFLs), LEDs, occupancy sensors, and smart power strips.

The Standard Program also includes the Green Nozzle initiative. The limited participation in the initiative during PY6 reflects AIC's decision in PY5 to place less emphasis on participation in this effort. As a result, participation has continued to decrease, with very few nozzles distributed in PY6.

Program Participation

The vast majority of projects (94%) completed through the Core Program in PY6 have associated electric savings, while 11% have gas savings and only 5% have both. Lighting projects accounted for 70% of electric savings and steam traps contributed 91% of gas savings.

Almost three-quarters of PY6 projects (72%) involved lighting. Table 4-1 summarizes the projects completed in PY6, by end use. The distribution of projects and savings by end use is consistent with that seen in PY5.

Table 4-1. Summary of Participation by End-Use

End Use	Projects		*Ex Ante* Gross Electric Savings		*Ex Ante* Gross Gas Savings	
	#	%	MWh	%	Therms	%
Standard Lighting	657	72%	45,074	70%	-	0%
Standard HVAC	129	14%	1,830	3%	85,583	9%
Specialty Equipment	57	6%	3,557	6%	-	0%
Standard Motor/VFD	43	5%	13,887	21%	-	0%
Steam Trap	23	3%	-	0%	887,223	91%
Leak Survey and Repair	1	<1%	263	<1%	-	0%
Total	**910**		**64,612**		**972,806**	

Participation in the Standard Program dipped in PY6 from PY5 (Table 4-2). Gross electric savings decreased from 98,744 MWh in PY5 to 64,612 MWh in PY6. Therm savings dropped even more substantially

in PY6 and were less than half of PY5's level[7]. Nevertheless, because the decrease in participation was anticipated, the program comfortably met its PY6 electric goals and came very close to meeting its therm goals.

Table 4-2. Historical Program Participation

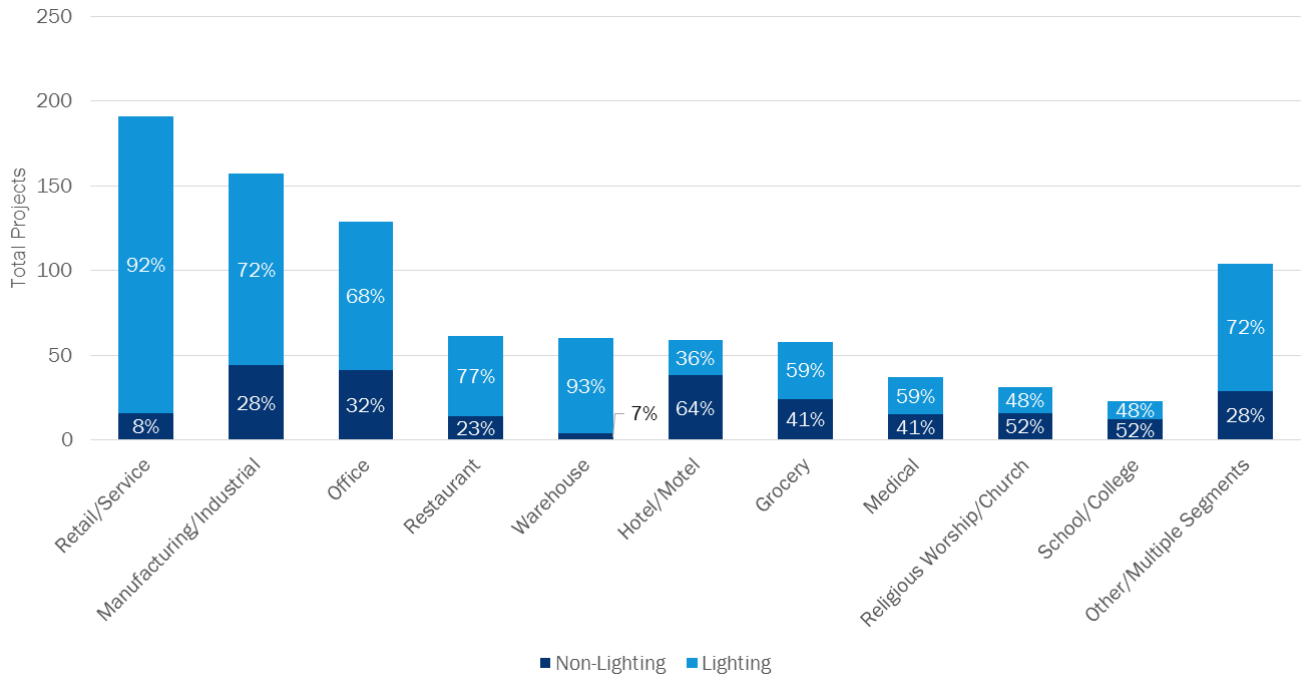
Program Year	Projects	Ex Ante Gross Electric Savings	Ex Ante Gross Gas Savings
	#	MWh	Therms
PY4	1,560	70,621	507,492
PY5	1,297	98,774	2,040,085
PY6	910	64,612	972,806

Participant Characteristics and Program Uptake

Projects completed in retail/service facilities accounted for the largest proportion of PY6 projects (21%). Other major facility types represented were manufacturing/industrial (17%) and office (14%). Lighting projects accounted for 72% of total PY6 Core Standard Program projects and represent the majority of projects for most facility types. Only hotel/motel, school/college, and religious/church facilities installed more non-lighting projects than lighting projects. Warehouses and retail/service facilities completed the largest share of lighting projects (93% and 92%, respectively). Figure 4-1 shows the breakdown of projects by facility and project type.

[7] PY5 appears to be an outlier with respect to its high level of savings.

Figure 4-1. PY6 Projects by Facility and Project Type



More than 600 companies participated in the program during PY6. Over three-quarters (78%) completed only one project. Only a very small number of companies (just over 2%) completed more than four projects, but this group completed 15% of the projects submitted to the program in PY6. This small group spanned a range of sectors, with representation in the manufacturing and industrial sector (31%), grocery, medical, office, and retail sectors (15% each), and one university (8%).

4.1.2 Program Design and Implementation

Implementation Changes and Challenges

Based on the participant survey and on interviews with program staff, the Standard Program generally continued to function smoothly and effectively in PY6. The program is relatively mature, and its implementation has remained stable. Despite this, AIC did implement some changes to the program in PY6, which are described below.

Core Program

With some small exceptions, the Core Program's implementation in PY6 remained similar to that of previous years. Program staff said that, due to increased and targeted program marketing efforts and the availability of a new program bonus, the program received many applications early in the program year and was able to comfortably reach its goals. Program staff indicated that, once the large initial group of applications was received, the program remained on track to meet its goals throughout PY6. Program staff also strategically delayed some projects from PY6 into PY7 in order to remain within the program's budget.

In PY6, the program implementer, Leidos, launched a new data tracking system for the C&I portfolio, called Amplify. This shift from AIB, the previous tracking system, represented the most significant change for the C&I programs. Two key factors initiated this change.

- First, the program intends to switch to a new application system, AMPMagic, in PY7. Amplify is designed to work seamlessly with this new application system. Program staff implemented a limited pilot of AMPMagic with program allies in PY5, and they had planned to launch AMPMagic to allow online applications for lighting projects in PY6. However, the planned change was not made when staff realized the program would easily meet its PY6 goals and would likely exhaust its budget. Instead, they focused on preparing AMPMagic for launch in PY7.

- Second, the program implementer built Amplify to work with the Salesforce customer relationship management platform, allowing for greatly expanded customer lead tracking and reporting functionality than had been available with the previous database system. This increased functionality will help Energy Advisors and program staff track and manage past, current, and potential program participants.

Energy Advisors provided very positive feedback about Amplify. Most indicated that learning the new system required some time, but once they were acclimated to the new database, they found the additional features helpful. One Energy Advisor indicated that, while he believed the functionality of the database was ideal, he did not think the proper level of detail of information was being tracked. Energy Advisors also mentioned that the Salesforce-based platform was not yet being used to its full potential in customer lead tracking. In previous program years, Energy Advisors would track customer contacts on their own, and a complete transition to tracking customer interaction in Amplify has not yet occurred.

AweSummer Bonus

As noted above, the program implemented a new customer bonus incentive in PY6. Called the "AweSummer" bonus, it consisted of a 10% bonus on projects completed by the end of September 2013. The program intended this bonus to produce a large inflow of projects early in the program year. According to program staff, this goal was accomplished, due to the large early influx of projects in PY6.

Overall, 75 of the 910 PY6 projects (8%) were implemented with an AweSummer bonus, resulting in 6% of the program's gross MWh savings and 2% of the program's gross therm savings. In contrast to the perceptions of program staff, program allies generally did *not* believe the availability of the AweSummer bonus caused their customers to apply earlier. We further discuss program allies' perceptions of the available bonuses in Section 4.1.5.

Of the eight interviewed program participants who received an AweSummer bonus, seven recalled receiving the bonus as part of their project and six were aware of the bonus *before* submitting their application to the Standard Program. These six bonus participants were split on their likelihood of installing the same equipment without the bonus, with half indicating that they would have been likely[8] and one-third indicating that they would have been unlikely[9] to install the same equipment.

[8] A score of 7, 8, 9, or 10 on a scale of 0 to 10, where 0 means not at all likely and 10 means very likely.

[9] A score of 0, 1, 2, or 3 on the same 10-point scale.

Program Ally Bonuses

As in prior years, the Standard Program offered program ally bonuses at the beginning of PY6. Due to a large number of applications, however, the bonuses were suspended in September 2013. The majority of program allies did not express significant dissatisfaction with the suspension or suggest that any proposed projects were not completed due to the loss of this bonus. However, a minority did indicate that the loss of this "promised" bonus did affect their sales process and cost estimates for customers.

Marketing and Outreach

Overview of Marketing Strategy

According to our interview with program marketing staff, AIC and Leidos focused their marketing efforts in PY6 on expanding awareness of the program, trying to reach customers with measures relevant to their business needs, and communicating the customer benefits of the program. The program also focused on tracking customer involvement and understanding how customers became involved in the program in PY6. Program marketing in late PY5 and early PY6 emphasized motivating customers to take immediate action and become involved in the program, resulting in a substantial increase in applications early in PY6.

According to program staff, the PY6 changes to the marketing strategy—including the earlier deadlines for bonuses, emphasizing sector-specific calls to action, and starting Staffing Grant promotions[10] earlier—were all effective at driving participation.

In general, the AIC program implementation team identified six main marketing strategies for PY6, as shown in Figure 4-2.

[10] Staffing Grant offerings are discussed further in the Custom Program report.

Figure 4-2. Standard Program PY6 Marketing Strategies

Participant Exposure to Marketing Efforts

PY6 participants recalled a variety of marketing and outreach efforts. They most frequently cited program allies (70%), bill inserts (58%), email (48%), and the AIC website (42%) as sources of information about the program, consistent with the program's marketing strategies.

The vast majority of program participants (89%) indicated they find the marketing materials useful[11] in providing information about the program, with 37% of participants reporting materials to be very useful. Almost all participants who completed non-lighting projects (97%) said the marketing materials they saw were useful, and 85% of lighting project participants reported the same. This indicates that the program is doing an excellent job providing customers with valuable information, especially for more complex measures and projects. Only a small portion of customers indicate any level of dissatisfaction with marketing materials.

To understand the sources from which customers draw information about energy efficiency and identify any gaps in the marketing strategy, we asked participants where they typically look for information about how to save energy. The most common response is the Internet (54%), followed by AIC (27%), and contractors or vendors (10%). Respondents did not identify any major channels of information that AIC does not actively employ in marketing the program, indicating that the program has a well-developed marketing strategy that meets the needs of its participants.

Table 4-3. Core Program Customer Sources of Information (Multiple Responses)

Customer Information Sources	Percentage of Participants (n=100)
Internet	54%
AIC/utility	28%
Contractor or vendor	10%
Coworkers/Internal resource	2%
Other	8%
Don't know	5%

We asked participants who did not explicitly mention AIC (un-aided) whether they considered the company a resource for energy efficiency information. A large majority of this group (78%) said they do consider AIC a resource. Combined with those participants who indicated (un-aided) that they look to AIC for energy efficiency information, a total of 84% of participants say they would look to AIC as a source for information about energy efficiency. This number is consistent with results from PY5 and indicates that AIC has maintained an image as a trusted energy advisor to its customers.

[11] Either "very useful" or "somewhat useful" on a four-point scale ranging from 1 ("very useful") to 4 ("not at all useful").

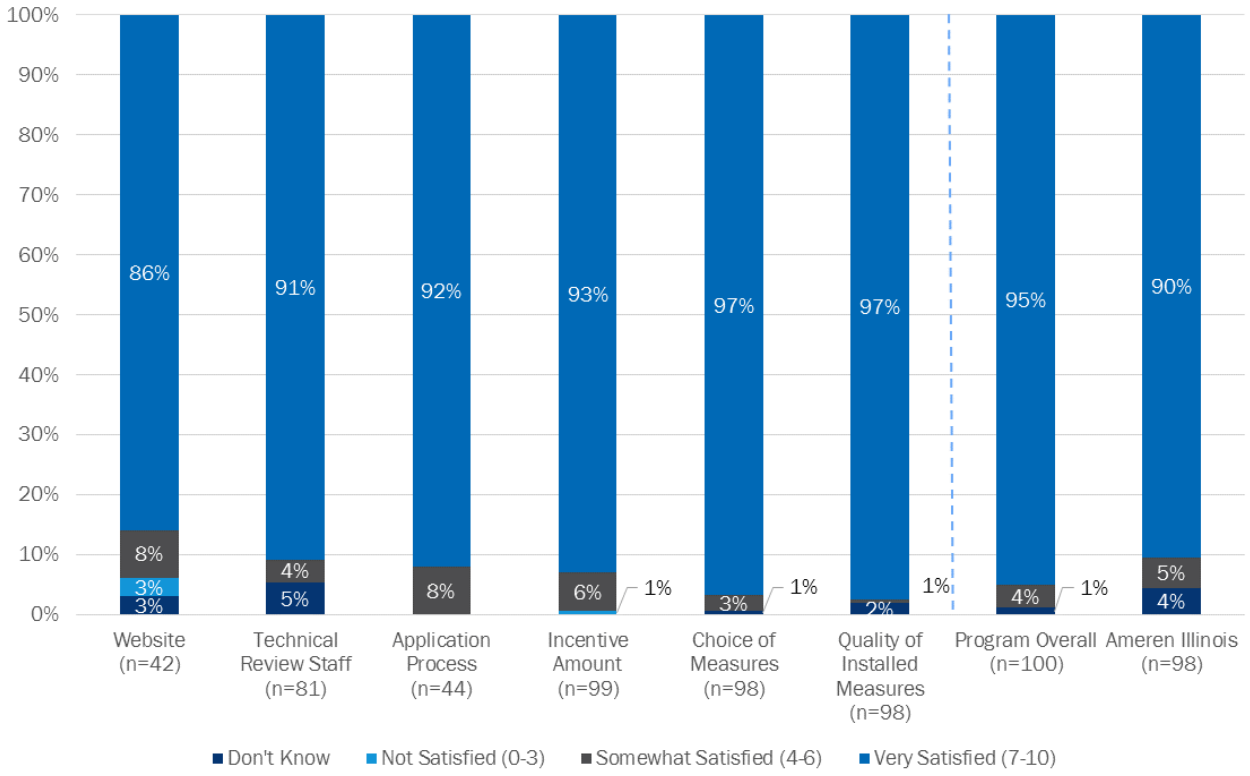
4.1.3 Participant Experience and Satisfaction

Participant Satisfaction

The vast majority of participants (95%) are satisfied[12] with the Core Program. Similarly, 90% of participants said they are satisfied with AIC.

As shown in Figure 4-3, participants generally rate all program elements favorably. We noted very few significant differences in satisfaction ratings for program components among participant groups. Lighting and non-lighting participants—as well as small, medium, and large businesses—generally give similar satisfaction ratings to the program and its various elements. This indicates that AIC and the implementation team have done an excellent job of building a program that works well for all customer types.

Figure 4-3. Participant Satisfaction with Standard Program Components



Note: Questions are based on a 10-point scale where 0 is "Very Dissatisfied" and 10 is "Very Satisfied."

The program's mean satisfaction rating of 8.8 for the application process indicates that participants are generally satisfied with the program's application process. The program simplified the application process in PY5, and the relatively high scores indicate it has done a good job maintaining participant satisfaction with the applications.

[12] A score of 7, 8, 9, or 10 on a scale of 0 to 10, where 0 means very dissatisfied and 10 means very satisfied.

As further evidence of high satisfaction with the program, only about one-third of participants provided recommendations for program improvement. The suggestions were primarily those typically seen for C&I energy efficiency programs such as higher or more incentives (50%) and streamlining the application process (19%).

We also asked program participants if they planned to participate in the program again. Seventy percent said they plan to participate in future years, while only 6% said they would not. Among those who do not plan to participate, the primary reason is they do not foresee a need for the incentivized equipment.

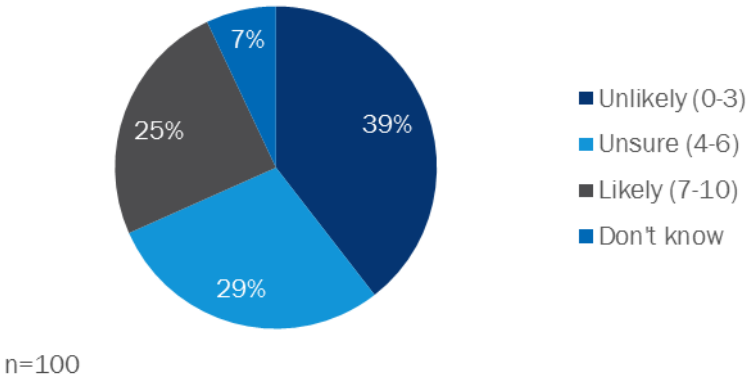
Program Trainings

AIC offers its business customers a number of trainings related to energy efficiency. Live webinars are offered about once a month on a variety of topics including technologies and program processes (e.g., how to fill out an application). The webinars are recorded and posted on YouTube, where customers can access them as needed. The program also offers Web-based "how to" courses accessible on demand through the program website. Last, the program offers special training events, such as the Practical Energy Management (PEM) training.

As in PY5, we found moderate awareness of AIC-sponsored training in PY6, with no notable changes from prior years. Almost half of program participants (46%) are aware that AIC offers training—including webinars, Web-based courses, and live instruction—to its business customers. Slightly more than half (52%) reported learning about the training through program emails. Only 10% of participants who know about AIC's training offerings report having participated in them. Everyone who has participated, however, has found the trainings useful.

Participants provided mixed responses when asked about how likely they are to participate in future AIC training. More than one-third of participants surveyed (39%) indicated they were likely[13] to participate in the future, but 29% were unsure about participating, and 25% said they were unlikely to participate at all.

Figure 4-4. Participant Likelihood to Participate in Future AIC Training



[13] A score of 7, 8, 9, or 10 on a scale of 0 to 10, where 0 means not at all likely and 10 means very likely.

We asked the program participants who rated as five or more the likelihood they would participate in future trainings what topics would be most interesting. The substantial majority (73%) said training focused on specific equipment types, while a smaller group expressed interest in financial training or training designed to result in certifications.

Program Website

Given the central role of the ActOnEnergy website as a "one-stop shop" for information on all of AIC's business programs, the evaluation sought to explore how program participants use the website. We first assessed what percentage of program participants use the program at all, and found that 40% of program participants indicate that they have seen or used the ActOnEnergy Business Program website at some point.

Participants who have used the website most commonly report doing so to find incentives (36%) or to get general program information or updates (31%). Only 5% of participants used the website to check their application status. Most users (84%) reported being able to easily find the information they wanted. Among the 60% of participants who had not seen or used the website, 32% said they did not know it existed, and 19% thought the website was not useful for them.

Along with the planned implementation of online applications through AMPMagic in PY7, program staff members are developing a mobile-friendly version of the ActOnEnergy website. They also are preparing a password-protected program ally landing point with additional program information, and they are making minor changes to the website's look and feel.

4.1.4 Energy Advisor Experience & Satisfaction

In addition to dedicated program marketing, technical review, and call center staff, the ActOnEnergy Business Program has seven regional Energy Advisors who market and support energy efficiency projects to AIC commercial and industrial customers. The Energy Advisors help customers identify and address opportunities for energy efficiency through participation in the Standard, Custom, and Retro-Commissioning programs. As part of our evaluation, we interviewed five of the seven Energy Advisors active in the ActOnEnergy Business Program during PY6. The Energy Advisors were very positive about their role and about the operation and structure of the ActOnEnergy Business program as a whole. All felt their job has well-defined and reasonable responsibilities, and they agreed the Energy Advisor team operated smoothly.

Energy Advisor Responsibilities

AIC's service territory is divided into seven geographic territories, each the responsibility of an Energy Advisor and containing about the same number of AIC customers. The Energy Advisors had no issues with the size of their geographical areas or their customer responsibilities, and generally felt the program was staffed at appropriate levels.

Program Mechanics & Coordination

In addition to regularly scheduled communication and meetings, Energy Advisors reported frequent informal communications with other Energy Advisors. When they encountered unfamiliar technical issues, the Energy Advisors reported frequently reaching out to their colleagues who might be more skilled in that area.

The numerous goals set for Energy Advisors include personal goals for individual advisors and program-wide goals—such as goals for savings and for contacts with potential customers—for all seven combined. The Energy

Advisors felt that goals were thoughtfully set and achievable, and they generally reported being able to meet them in PY6.

The Energy Advisors also reported good working relationships and substantial coordination with AIC Key Account Executives (KAEs). KAEs have their own energy efficiency goals to meet, so there is substantial motivation for KAEs and Energy Advisors to help large customers managed by the KAEs complete projects through the program. Energy Advisors also cited the well-developed relationships between KAEs and large customers as beneficial in helping convert more efficiency opportunities into projects through the program.

Energy Advisors reported less interaction with other AIC staff, but they did say that marketing and outreach staff, as well as the AIC call center, do a very good job of funneling to the Energy Advisors potential customers who call seeking information on energy efficiency.

Customer Relationship and Project Acquisition

Energy Advisors believe they are successful in helping the program achieve its goals and gain new participants. They identified a number of different strategies for acquiring projects depending on the types of potential customers with which they interact. For smaller businesses or customers that may not have participated in the program before, Energy Advisors use several strategies, including visits to customer facilities and telephone contact with potential participants, during which they will provide program information and attempt to gather information on the customer's needs.

For larger customers and prior program participants, Energy Advisors leverage their knowledge of the customer, their facility, and their past participation in the program, if any, in order to identify opportunities for energy efficiency improvements the customer could make. Energy Advisors indicated that tracking customers this way is beneficial. For example, during a project, an Energy Advisor might notice a system that will need replacement in future years and note this information. Advisors regularly review their notes and information on customers in their territories, looking for opportunities that may have arisen since their last contact with the customer.

Energy Advisors specifically said that Amplify, the new program tracking system, will be extremely useful in recording and tracking customer interactions and potential leads. Although, as noted earlier, Energy Advisors did report some challenges in adapting to the new system, several mentioned being pleased with its customer lead tracking functionality. Advisors said the previous data-tracking system could not easily track this information, and reviewing customer information looking for potential projects would involve reviewing paper notes, as well as relying on the Energy Advisor's memory and experience with customers in their service territory. Amplify's ability to track customer relationships should allow this information to be documented in a standard manner and should simplify the process of searching for new opportunities. Feedback from Energy Advisors indicated that, while this functionality is available, they are not yet fully using it, given the complexity of transitioning from processes for managing customer information developed prior to the implementation of Amplify.

4.1.5 Program Ally Experience and Satisfaction

As part of our evaluation, we interviewed 12 program allies active during PY6. They represented a number of market actor types including electrical and mechanical contractors, equipment suppliers, and wholesalers. Program allies also varied in terms of the length of their participation in the ActOnEnergy Business Program. A third of interviewed allies reported being relatively new to the program, having become a registered program ally in 2012 or later and a third reported joining the program in 2010 or 2011, and a third joined prior to 2009.

We spoke primarily to allies who had substantial experience with the program in PY6: two-thirds of interviewed allies reported having completed 10 or more projects through the Standard and Custom programs in PY6. Most allies reported completing primarily lighting projects through the program. We also spoke with several small companies that handle only a few projects through the program each year.

Marketing and Outreach

Most program allies perceive customers as being only somewhat aware of the ActOnEnergy Business programs. Generally, allies reported that a substantial portion (but less than half) of their customers know that the program exists, but are not well informed about its offerings. Only two allies thought that more than half of their customers are aware of the program, and one of them self-identified as being a contractor well known for energy efficiency services. That ally indicated that customers would typically contact them in order to complete projects through the program.

All but two interviewed allies reported promoting the program to nearly every customer with whom they spoke who was not already aware of it. A few allies indicated that they specifically focused their marketing on the ActOnEnergy Business program (including co-branding or approval of materials by AIC), but most indicated only a casual use of program marketing materials. Instead, most program allies told us, they preferred face-to-face or telephone conversations with potential customers, at which point they would discuss the program and its benefits for the customer.

Participation & Program Processes

Every program ally interviewed said that email was the best way to keep them up to date with program changes. Multiple allies also noted their regional Energy Advisor was also an ideal source for keeping informed, and they felt comfortable contacting their advisor for program information. Without prompting, many allies indicated that they were quite satisfied with the program's distribution of information to them and they felt well informed about program updates and changes.

As noted earlier, most allies did not believe that the availability of the AweSummer bonus caused their customers to apply earlier or apply for projects they otherwise would not have completed. Several program allies said that the lifecycle of their typical projects was too long to complete new projects between the announcement of the bonus and the deadline. One ally mentioned that a project typically has a "six-to-twelve-month cycle," and that, because the bonus window was only three months long, projects that were already in the pipeline most often received the bonus if their timing happened to match the bonus availability period. A few allies mentioned that they tried to speed up projects in the pipeline to qualify for the bonus, if possible, but only one firmly believed the bonus brought in new projects that otherwise would not have happened.

Most program allies were aware of the suspension of the program ally bonuses in PY6. None believed that it caused planned projects not to go forward, but several did express dissatisfaction with the seemingly transient nature of this bonus. One ally said:

> *"We don't plan for [the bonus], we don't use it in any way, shape, or form because if we did plan on that money then we would be hurting ourselves."*

Another ally said they never planned to pass along to the customer the program ally bonus associated with specific projects. Instead, they just used the bonus funds, if available, to help market the program more.

Most allies reported an increase in their sales of energy-efficient equipment in the past year. Some allies attributed this increase to the program, but many believed increases are primarily due to shifting consumer attitudes about efficient lighting equipment. About half of the interviewed allies also reported changing

business practices as a result of the ActOnEnergy Business program. These changes included increasing program-related marketing, keeping extra stock of program-incented measures, and hiring additional staff to deal with program-related tasks.

Satisfaction and Barriers

Generally, program allies expressed satisfaction with the ActOnEnergy Business Program: all but one rated the program a 7 or above on a scale of 0 to 10, and the mean score among allies was 8.4. When asked to rate satisfaction with program components, most program allies provided very positive scores. Only two interviewed allies provided negative feedback about more than one part of the program. All other allies either had no stated complaints about the program, or had only one isolated complaint.

ActOnEnergy Business program staff received extremely positive feedback, with allies mentioning their satisfaction with them repeatedly and in multiple contexts. One ally said,

> *"The ActOnEnergy staff that we work with have been knowledgeable and easy to work with… they explain the program well to allies, [and] staff is available to answer questions."*

Some allies did express frustration with ActOnEnergy Business Program technical review staff, however, either with the length of the project review period or, more specifically, with perceived nitpicking or unnecessary requests for application information.

Program allies provided a range of comments about barriers to participation or completion of more projects through the program. They did not identify any consistent barriers to their participation in the program. Frequently mentioned barriers to potential participants that were mentioned multiple times included upfront cost of projects to the customer and customer awareness or understanding of program. Multiple program allies said they believe customers think the program is "too good to be true." These allies said they think the program needs to do more marketing to inform customers about the details of the program, so they will understand how the program works, accept that the opportunities are real, and pursue them.

Two program allies also mentioned issues with LEDs incentivized through the program. One said he believed the LED incentive needed to be higher to motivate customers to pursue these measures rather than linear fluorescent lights. Another indicated that the new versions of LED lights that customers wanted were not available through the program.

4.2 Impact Assessment

The following sections provide measure verification rates and gross and net impacts for PY6.

4.2.1 Gross Impacts

Our impact analysis yielded ex post gross electric and gas energy savings and peak electric demand savings. Total gross energy and demand impacts for the PY6 Standard Program are shown in Table 4-4.

Table 4-4. Standard Program Gross Impact Summary

Savings Category	Ex Ante Gross	RR	Ex Post Gross
Energy Savings (MWh)			
Core Program	64,612	99.7%	64,415
Online Store	16,579	100.0%	16,584
Green Nozzle	26	100.0%	26
Total MWh	**81,217**	**99.8%**	**81,024**
Demand Savings (kW)			
Core Program	12,703	99.7%	12,660
Online Store	3,077	100.5%	3,092
Green Nozzle	0	N/A	0
Total kW	**15,780**	**99.8%**	**15,751**
Gas Savings (Therms)			
Core Program	972,806	99.8%	971,133
Online Store	0	N/A	0
Green Nozzle	9,424	100.0%	9,424
Total Therms	**982,230**	**99.8%**	**980,557**

Core Standard Program

AIC customers installed over 2,000 individual measures through the Core Program in PY6 as part of 910 projects. As in previous years, the majority of projects consisted of lighting installations, followed by HVAC.

Table 4-5. PY6 Standard Core Program Verification Results[14]

Measure Type	Program-Tracking Measure Count	Verified Measure Count	Verification Rate
Lighting	1,824	1,824	100%
HVAC	234	234	100%
Specialty Equipment	75	75	100%
Variable Frequency Drives	57	57	100%
Steam Traps	54	54	100%
Leak Survey and Repair	1	1	100%
Total	**2,245**	**2,245**	**100%**

Our impact analysis activities for the Standard Program yielded ex post gross electric and gas savings, and peak demand savings that are approximately equal to ex ante estimates.

[14] Note that the number of measures consists of the sum of the number of measure types per project and does not reflect the quantity of bulbs or fixtures installed.

Table 4-6. PY6 Standard Core Gross Impacts

Measure Type	Verified Measures	Ex Ante Gross			Ex Post Gross			Realization Rate		
		kW	MWh	Therm	kW	MWh	Therm	kW	MWh	Therm
Lighting	1,824	8,016	45,074	0	7,969	44,872	0	99%	100%	-
HVAC	234	452	1,830	85,583	456	1,836	81,890	101%	100%	96%
Specialty	75	1,729	3,557	0	1,729	3,557	2,020	100%	100%	-
Variable Frequency Drives	57	2,476	13,887	0	2,476	13,887	-	100%	100%	-
Steam Traps	54	0	0	887,223	0	0	887,223	-	-	100%
Leak Survey and Repair	1	30	263	0	30	263	-	100%	100%	-
Total	**2,245**	**12,703**	**64,612**	**972,806**	**12,660**	**64,415**	**971,133**	**99.7%**	**99.7%**	**99.8%**

We describe the engineering review approach and outline the small discrepancies found for each measure type below.

The engineering review of measures examined two issues:

1) Whether the prescribed savings algorithms from the Illinois TRM version 2.0 were correctly implemented in the tracking system for ex ante gross savings.

2) Whether savings for measures in sampled projects that did not have prescribed savings algorithms were estimated correctly.

Projects with Illinois TRM prescriptive savings measures were checked against supporting documentation from the implementer outlining their translation of the TRM to ActOnEnergy Business Program measures. The supporting documentation was provided to the evaluation team as a set of spreadsheets covering Standard Program end-uses, with one tab per ActOnEnergy measure. The spreadsheets reproduced the TRM algorithms and inputs used to generate per-unit savings. The first step in the review process confirmed that each TRM spreadsheet was complete and correct in the estimation of measure savings. The spreadsheets were easy to follow and no errors were identified. The second review step confirmed that the TRM values were used properly in the tracking system to report ex ante savings. This check examined whether the unit savings in the tracking system matched the spreadsheet for the measure under review, based on parameter and custom input values such as building type, fixture wattages, equipment capacities, and baseline or operating characteristics.

All non-prescriptive measures in the sample received an engineering review. The ex ante savings estimate was adjusted if the project data or calculation approach was found to contain an error, or an unsupported assumption was judged inconsistent with standard engineering practices and judgment. Several projects required more extensive review of the project documentation.

The engineering review resulted in savings adjustments for the following end-uses:

- HVAC
  - Parameters listed on applications do not exactly match parameters listed in the database (e.g., SEER, EER, capacity) for approximately 5% of the measures. We used parameters listed on applications when there was a discrepancy.

- There are no ex ante demand savings for gas furnace replacements with air conditioning (measure code BPH7) in the program-tracking database. We followed the TRM and implementer spreadsheets to determine ex post demand savings for the air conditioning component of these measures, resulting in a relatively small contribution (0.01%) to the ex post savings.

- One project installed an air conditioner (measure code BPC25) resulting in a realization rate of nearly 20,000% for both energy and demand savings. The reason for this large discrepancy appears to be a data entry error in that the ex ante calculations use a capacity of 1 kBtu/hr from the database. Ex post savings use a capacity of 199.7 kBtu/hr, which was included on the application. Since the measure description requires a capacity of 135-240 kBtu/hr, we concluded that the number on the application is accurate.

- Lighting

We performed site visits to verify installation of lighting fixtures in 42 different facilities that participated in PY6. We were unable to verify lighting for two of the sites in our sample due to access or security issues while at the facility (i.e., one was a police station and the other a large warehouse), leaving us with 40 visited sites. We verified a lighting installation rate of 98.9% for the 40 visited sites. We used this installation rate, along with the engineering desk-review of all lighting projects, to develop our ex post savings. Other adjustments from the engineering desk-review include the following:

- The program-tracking database did not include the controlled wattage for occupancy sensors, so we back-calculated it using ex ante savings estimates and inputs from the implementer spreadsheets to solve for the controlled wattage used in the ex ante calculations.[15] We then selected a sample of 10 projects, including the three largest, and confirmed the back-calculated controlled wattage with the value listed on the applications in Amplify. Because the back-calculated controlled wattage was accurate for all 10 sampled projects, we used the individual back-calculated value for each project when determining savings. This resulted in a realization rate of 100% for occupancy-control-measure demand and energy savings. We recommend including the controlled wattage of occupancy sensors for individual projects in the database moving forward to allow for easier and more accurate savings calculations.

- We used the results of the telephone survey to update inputs to 13 projects. In particular, we made two types of updates: changing whether the measures were installed in a cooled space or not, and removing measures when the survey results indicated they were not installed. In total, the changes revised the ex post lighting energy and demand savings down by less than 0.5% for these 13 projects. Table 4-7 summarizes the findings for projects that were adjusted.

[15] Since the completion of this analysis, the evaluation team learned that Leidos does track kW controlled in the program-tracking database. However, it was not included in the extract provided to the evaluation team due to an error.

Table 4-7. Core Gross Impacts Adjusted Based on Individual Responses

Project Number	Impact on Savings (Increase v. Decrease)	kWh Change	Explanation
600186	↓	(2,828)	High bay fixtures were installed in an uncooled space, while Amplify indicated it was cooled.
600666	↓	(18,743)	High bay fixtures were installed in an uncooled space, while Amplify indicated it was cooled.
600715	↑	22,807	Measures were installed in cooled spaces, while Amplify indicated it was uncooled.
600940	↓	(6,825)	High bay fixtures were installed in an uncooled space, while Amplify indicated it was cooled.
601075	↓	(68,613)	Only new fluorescent fixtures were installed, not high bay fixtures while Amplify indicated both were installed.
601354	↑	958	High bay fixtures were installed in cooled spaces, while Amplify indicated it was uncooled.
601407	↓	(55,605)	Only exterior fixtures were installed, not interior LED fixtures, while Amplify indicated both were installed.
601444	↓	(8,813)	Only LED fixtures were installed, not fluorescent fixtures, while Amplify indicated both were installed.
601504	↓	(25,224)	High bay fixtures were installed in an uncooled space, while Amplify indicated it was cooled.
601532	↓	(29,963)	High bay fixtures were installed in an uncooled space, while Amplify indicated it was cooled. Low-wattage T8s were not installed, while Amplify indicated they were installed.
601540	↓	(4,550)	Measure BPL68 Permanent Fixture/Lamp Removal were not removed, while Amplify indicated they were removed.
601654	↓	(10,828)	LED down lights were not installed, while Amplify indicated they were installed.
601689	↑	356	Some T8 fixtures were installed in cooled spaces, while Amplify indicated all fixtures were in uncooled spaces.
Total	↓	**(208,787)**	

Online Store

We verified program participation by examining the online store product data for product eligibility and time of sale or disbursement. Our review of the program-tracking data found that all products were provided to customers during the eligible time period.

Table 4-8. Online Store Verification Results

Measure Type	Program Tracking Measures	Verified Measures	Verification Rate
Lighting Kit (3 LED and 3 CFL)	5,819	5,819	100%
Lighting Kit (6 CFLs)	4,761	4,761	100%
Kit Sub-Total	**10,580**	**10,580**	**100%**
CFL Floodlight	503	503	100%
CFL Globe	66	66	100%
CFL Spiral	3,925	3,925	100%
LED Exit Sign	512	512	100%
LED Exit Sign Bulbs	10	10	100%
LED Lights	853	853	100%
Motion Sensor	153	153	100%
Power Strip	13	13	100%
T8 Ballast	614	614	100%
T8 Lamps	46	46	100%
Vending Control	3	3	100%
Store Sub-Total	**6,698**	**6,698**	**100%**
Total Online Store	**17,278**	**17,269**	**100%**

We calculated ex post savings nearly identical to ex ante savings for the online store kits and online store purchases, resulting in realization rates of 100% or higher. Table 4-9 summarizes the online store gross impacts.

Table 4-9. Online Store Gross Impacts

Measure Type	Verified Measures	Ex Ante Gross		Ex Post Gross		Realization Rate	
		MW	MWh	MW	MWh	MW	MWh
Lighting Kit (3 LED and 3 CFL)	5,819	1,402	5,525	1,402	5,525	100.0%	100.0%
Lighting Kit (6 CFLs)	4,761	1,396	5,666	1,396	5,666	100.0%	100.0%
Online Store Purchases	6,698	280	1,313	294	1,318	105.2%	100.3%
Sub-Total	**17,278**	**3,077**	**12,504**	**3,092**	**12,509**	**100.5%**	**100.0%**
PY5 Carryover Savings	N/A	N/A	4,075	N/A	4,075	N/A	100%
Total Online Store	**17,278**	**3,077**	**16,579**	**3,092**	**16,584**	**100.5%**	**100.0%**

In addition to the PY6 gross impacts, the application database reports a carryover from PY5 of 4,075 MWh, which we did not verify independently. Adding this to the PY6 gross impacts results in total ex post savings of 16,584 MWh.

Green Nozzle

The evaluation team verified the number of measures and ex ante savings for the Green Nozzle initiative through a review of a spreadsheet supplied by the implementer. We confirmed that the implementer used the correct TRM algorithms to estimate savings. Therefore, we did not adjust the number of installed measures or ex ante savings for the initiative. As such, ex ante and ex post impacts are identical.

Table 4-10. Green Nozzle Gross Impacts

Measure Type	Verified Measures	Ex Ante Gross			Ex Post Gross			Realization Rate		
		kW	MWh	Therm	kW	MWh	Therm	kW	MWh	Therm
Green Nozzle	85	N/A	25.9	9,424	N/A	25.9	9,424	N/A	100%	100%

4.2.2 Net Impacts

We used the following NTGRs to determine net impacts for the PY6 Standard Program, based on research conducted in PY4. The specialty measure database contains a mix of refrigeration, commercial kitchen, and guest room energy management (PTAC) measures. We used the respective NTGR for refrigeration and commercial kitchen measures, and we used the HVAC NTGR for guest room energy management measures.

Table 4-11. NTGR from PY4 Used for PY6

Measure Type	Electric NTGR	Gas NTGR
Lighting	0.62	N/A
HVAC	0.43	0.80
Motor/VFD	0.80	N/A
Refrigeration (Specialty)	0.83	N/A
Kitchen (Specialty)	0.54	0.73
Steam Traps	N/A	1.00
Online Store	0.83	N/A
Green Nozzle	0.92	0.89

Using the NTGRs shown in Table 4-11, we calculated net impacts for the PY6 Standard Core Program measures in Table 4-12. Total net energy and demand impacts for the PY6 Standard Program are 55,332 MWh, 10.5 MW, and 972,082 therms. The net realization rate is 95% for electric savings, 93% for demand savings, and 100% for gas savings. Given the very high gross realization rate and the deemed NTGR, the level of confidence in the net impacts is very high.

Table 4-12. PY6 Standard Core Program Gross and Net Impacts

Savings Category	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)			
Core Program	64,415	0.65	41,737
Online Store	16,584	0.83	13,764
Green Nozzle	26	0.92	24
Total MWh	**81,024**	**0.69**	**55,525**
Demand Savings (MW)			
Core Program	12.7	0.63	7.9
Online Store	3.1	0.83	2.6
Green Nozzle	0	0.92	0
Total MW	**15.8**	**0.67**	**10.5**
Gas Savings (Therms)			
Core Program	971,133	0.98	954,210
Online Store	0	N/A	0
Green Nozzle	9,424	0.89	8,387
SBDI (Gas only)	10,176	0.90	9,158
Big Bonus	430	0.76	327
Total Therms	**991,163**	**0.98**	**972,082**

4.3 Conclusions and Recommendations

AIC successfully implemented the Standard Program in PY6 and surpassed its electric and gas savings goals by a comfortable margin. In fact, because of the extremely high number of applications early in PY6, the program deferred some applications to PY7 in order not to exceed the program's budget. Program stakeholders we spoke with (staff, Energy Advisors, participating trade allies, and participants) reported that they were generally satisfied with the program, and we detected no major barriers to participation or problems with program processes. Nevertheless, we identified some areas in which the program could improve.

Based on our research, we provide the following recommendations for the program:

- **Explore restructuring AweSummer bonus offering.** We found that customer program bonuses are not highly influential in motivating new projects to enter the program. Most program allies reported that that the AweSummer bonus, intended to motivate additional projects to enter the program early, did not markedly speed the progress of any of their projects; rather, projects that happened to be in the pipeline received an unexpected bonus. In addition, half of interviewed participants who received an AweSummer bonus indicated that they would have been likely to install the same project without the bonus. While the program is meeting its goals, restructuring or eliminating the AweSummer bonus could help attain more savings with the same level of program expenditure.

- **Encourage Energy Advisors and other program staff to fully leverage features of Amplify.** Energy Advisors strongly believe the customer lead tracking features built into the new program-tracking database, Amplify, will be very useful to them in conducting customer outreach. However, the Energy Advisors also indicated that the database is not yet being used to its full potential. Energy Advisors need to more fully take advantage of Amplify by incorporating more useful information on customer

contacts into the system. AIC should consider working with program staff, implementers, and Energy Advisors to increase the amount of information entered into Amplify to improve the usefulness of its lead tracking capabilities.

- **Fine tune the information collected in the application and program-tracking database.** Although AIC achieved a gross realization rate of nearly 100% for the program, we found some minor data discrepancies in the course of our engineering review. We also recommend better QA/QC to ensure that the database matches exactly what is on the application forms; the planned movement to an online application should minimize transcription errors.

Appendix A. Data Collection Instruments

AIC PY6 CI Standard Survey FINAL.docx

AIU C&I Energy Advisor Guide FINAL

AIC C&I Trade Ally Guide FINAL.docx

Appendix B. Survey Response Rate Methodology

Given that survey response rates are calculated and presented for the Core Program participant survey, we present here a definition and explanation of how the rate is calculated. The survey response rate is the number of completed interviews divided by the total number of potentially eligible respondents in the sample. We calculated the response rate using the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR).[16] For various reasons, we were unable to determine the eligibility of all sample units through the survey process and so chose to use AAPOR Response Rate 3 (RR3). RR3 includes an estimate of eligibility for these unknown sample units. The formulas used to calculate RR3 are presented below. The definitions of the letters used in the formulas are shown in the Survey Disposition tables in the Participant Telephone Survey section of the report.

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

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

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

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

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

Appendix C. Additional Gas Savings from the Small Business Program

The team included additional gas savings from the Small Business Direct Install (SBDI) and Big Bonus program offerings that were provided through the Illinois Power Agency, but were supported with 8-104 funds to allow for the provision of a small amount of gas-saving measures. Those gas savings are claimed in this report.

The SBDI program did not claim any ex ante gas savings for measures installed in buildings with gas hot water heaters. These measures included low-flow faucet aerators, green nozzles, and low-flow showerheads. We used the Illinois TRM version 1 to estimate savings for these measures, which amounted to 10,176 therms.

The Big Bonus program claimed 892 therms from three HVAC measures, a gas boiler tune-up and two gas furnace replacements. We estimated ex post savings of 430 therms, resulting in a realization rate of approximately 48%. We believe the difference in savings may be due to the use of different baseline and efficient AFUE ratings for the gas furnace replacements. Both projects that received the efficient furnace needed a new furnace regardless of the program, since one was on a new construction project and the other was replacing a failed piece of equipment. Because of this, we wanted to use the baseline efficiency available on the market for a new furnace. According to the Illinois TRM version 1, the baseline AFUE of a furnace installed in 2013 is 90%. Had we used a lower efficiency, such as 80% AFUE for the baseline, our savings would have increased. In addition, the AFUE of the efficient furnace was not listed in the database, so we assumed 94% AFUE, which is the minimum to qualify for the program. Using a higher AFUE for the efficient furnace and a lower baseline efficiency likely would have accounted for the differences seen in the ex ante and ex post estimates.

Appendix D. PY5 Report Update - Non-Participant Spillover

The PY5 C&I Standard Report presented findings from NTG research conducted as part of that year's evaluation. As noted in Appendix C of the PY5 report, the evaluation team fielded a non-participant survey to gather information regarding possible non-participant spillover (NPSO) from the C&I programs implemented by AIC (i.e., Custom, Standard, and Retro-Commissioning). At the time the PY5 report was finalized, the evaluation team had presented initial NPSO values for discussion with AIC and ICC staff. As a result of those discussions and additional information provided by survey respondents, the team revised the draft NPSO value resulting in a final overall NPSO value of 0.01.

This NPSO value is included in the recommended electric NTGRs for the C&I Custom, Standard and Retro-Commissioning Programs presented by the evaluation team to the SAG for PY7 and PY8.

For more information, please contact:

Jake Millette
Project Manager

617 492 1400 tel
617 497 7944 fax
jmillette@opiniondynamics.com

1000 Winter St
Waltham, MA 02451