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Impact and Process Evaluation of the 2013 Illinois Power Agency Small Business Direct Install Program

Final

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CADMUS

NAVIGANT

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1. Executive Summary

This report presents results from the first year (which we refer to as IPA PY6 or IPA 2013) of the Leidos Small Business Direct Install (SBDI) Program, which is one of five stand-alone Illinois Power Authority (IPA) energy efficiency programs implemented from June 2013 to May 2014.

The PY6 evaluation of the SBDI Program involved both impact and process assessments. To support the process evaluation, we conducted a review of program materials and program-tracking data, interviews with program implementation staff, interviews with Small Business Program Allies (SBPAs) and Small Business Energy Advisors (SBEAs), and application review and site visits to inform gross impacts. Our quantitative research efforts included a telephone survey with SBDI participants to explore process-related issues and attribution.

Below we present the key findings from the PY6 evaluation.

Impact Results

Table 1 summarizes the net electricity and demand savings from the SBDI Program. The program achieved high gross and net realization rates as a result of the evaluation team's application of deemed per-unit savings values for most measures, as well as the application of the net-to-gross ratio (NTGR) from AIC's IPA filing from Docket 12-0544 for this program (0.90).

Table 1. PY6 Net SBDI Program Impacts

	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)					
Total kWh	21,907	109.5%	23,994,273	0.90	21,769
Demand Savings (MW)					
Total kW	4	100.1%	4,105	0.90	4

Process Results

Program implementers completed a successful program year in terms of goal attainment and satisfaction with the SBDI Program. Customers reported satisfaction with every component of the program and all interviewed program participants reported that they would recommend the program. The program implementation team was able to deliver a program that was easy to participate in and helped customers overcome key barriers to participation, such as the cost of energy efficient equipment and the difficulty of navigating the program application process. By offering discounted equipment and handling the application process for the customer, program implementers helped ensure customer satisfaction.

The program's community-based approach allowed program implementers to leverage relationships developed with small businesses and raise awareness through word of mouth. In addition to this channel, the Chambers of Commerce, as well as direct outreach through SBEAs and SBPAs, was effective in building trust

among eligible customers. Furthermore, program implementers achieved high conversion rates[1] across AIC's territory and managed a geographic rollout that left potential for program success in future years.

Based on the team's PY6 evaluation activities, we make the following recommendations for the program:

- **Explore the feasibility of increasing program incentives and offering more measures through the program.** The greatest barrier to installing energy efficient equipment cited by participants was the cost of the equipment, and even some full participants (i.e., those who installed recommended measures after receiving their assessment) reported that they did not install all of the measures due to the cost of the equipment. Another recommendation made by participants, SBPAs, and SBEAs alike was to increase the types of measures available through the program, specifically LEDs.

- **Inform SBPAs of the small business customers who are eligible to participate in the program and the customers who have already been targeted.** The process of giving SBPAs the opportunity to conduct energy assessments worked well in PY6. However, program allies reported that they were often approaching small business customers who had already participated in the program or were not even eligible to participate in the program. SBPAs would be able to conduct energy assessments more efficiently if they knew which small business customers were eligible to participate and which customers were already targeted by the program.

- **If the program would like to determine the program uptake rate in the future, targeted customers need to be tracked during the program year.** To determine how many targeted customers go on to complete energy assessments, the evaluation team needs to know who was targeted through the program. This would include customers who were directly sent marketing materials, as well as customers who were approached by SBEAs and SBPAs to participate in the program.

- **Continue to prioritize transparency in addressing program costs.** Program implementers did a great job of adjusting the program implementation so that participants were notified of additional project costs, such as sales taxes and 1099s. It is important for the program to continue to be transparent about program costs so that it can continue to develop trust with its customers.

[1] The conversion rate is the percentage of small businesses that receive energy assessments that go on to install measures through the program.

2. Introduction

2.1 Program Description

Leidos began the Small Business Direct Install (SBDI) Program, one of five stand-alone Illinois Power Agency (IPA) energy efficiency programs, as a pilot in PY5 and launched it as a formal program in PY6. The program is implemented by Leidos (the "implementation contractor"), and offers AIC business customers in the DS-2 rate code a free energy assessment, as well as the installation of energy efficient measures. In particular, the program offer includes a package of free measures, a $129 premium package, and additional measures that go beyond the premium package. The free package includes CFLs, faucet aerators, low-flow shower heads, and pre-rinse spray valves,[2] while the premium package includes 42W CFLs, LED exit signs, and lamp/ballast retrofit of up to 80 reduced wattage T8 lamps. The additional measures include occupancy sensors, 8 foot T12 to 4 foot T8 conversion kits, and T12/T8 retrofits exceeding the 80-lamp limit. Table 2 shows the number of completed PY6 projects that involved each measure type.

Table 2. Number of Completed Projects Involving Each Measure Type

Measure Type	Number of Completed Projects	Percent of Completed Projects
Fluorescent Lighting Retrofit	2,015	95%
CFL	1,470	69%
Delamping	362	17%
Exit/Emergency Signs	590	28%
Hot Water Conservation Measures	180	8%
Occupancy Sensor	48	2%
Total [a]	**2,128**	–

[a] The number of projects completed involving each measure does not equal the total because projects involved multiple measure types.

Three key entities have roles in program delivery: small business energy advisors (SBEAs), small business program allies (SBPAs), and distributors. The SBEAs are program staff members who are stationed throughout AIC's service territory and who play a key role in providing participating customers with energy assessments. They also work with SBPAs—program-qualified electrical contractors who install eligible measures. Participating electrical distributors support both SBEAs and SBPAs by ensuring the supply of program measures. In general, AIC hopes that the customer experience with the SBDI Program will help channel customers into other ActOnEnergy Business programs.

2.2 Research Objectives

The research objectives for the PY6 SBDI evaluation are to provide estimates of gross and net savings attributable to the program. We determined gross energy and demand savings in accordance with Commission Orders for IPA programs. In addition, we verified measure installation, estimated the net-to-gross ratio (NTGR)

[2] The program is electric only and does not claim gas savings associated with water efficiency measures.

for use in calculating energy and demand savings in future program years, and assessed program processes and opportunities for improvement.

In particular, the PY6 impact evaluation answers 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 a number of process-related research questions as part of the PY6 evaluation aimed at exploring the program design and implementation in this first full year of program implementation.

1. Program Design and Implementation
    a. Has the program been implemented according to plan? If not, what changes have been made and why?
    b. What implementation challenges occurred in PY6, and what was done to address them?
    c. What program marketing and outreach strategies did the program implement in PY6? Were they effective at raising program awareness and driving participation?
2. Program Participation
    a. What was the program uptake rate, i.e., what percent of those targeted actually went on to complete assessments?
    b. What were the characteristics of participants? How many customers participated? In what geographic areas and business sectors do they participate?
    c. What motivated customers to participate in the program? What were the main barriers to participation?
    d. What percent of customers completed an installation after their assessment?
    e. Which measures were the most popular? Which measures had the lowest levels of implementation?
3. Participant Experience and Satisfaction
    a. How satisfied were participating customers with the program and the measures received?
    b. How did participating customers perceive AIC and the ActOnEnergy Program in general?

3. Evaluation Methods

Table 3 summarizes the PY6 evaluation activities conducted for the SBDI Program.

Table 3. SBDI PY6 Evaluation Activities

Activity	PY6 Process	PY6 Impact	Forward Looking	Details
Program Staff In-Depth Interviews	✓			Provided insight into program design and processes
Participant Survey Wave 1	✓		✓	Gathered data on program processes, as well as data to calculate NTGR
Participant Survey Wave 2	✓			Gathered data on program processes and participant satisfaction
SBEA and SBPA In-Depth Interviews	✓			Provided insight into program implementation and processes
Application Review		✓		Ensured program-tracking database was accurately capturing information
Verification Site Visits		✓		Confirmed installation of measures installed through the program
Participation Analysis		✓		Analyzed overall participation and conversion rates
Impact Analysis		✓		Calculated gross and net impacts for the program

3.1 Data Collection

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

3.1.1 Program Staff Interviews

We conducted interviews with implementation team staff to understand the SBDI Program's design and implementation and to discuss evaluation priorities. In total, we completed three interviews with program staff.

3.1.2 Review of Program Materials and Data

We conducted a comprehensive review of all program materials and tracking data. We reviewed program marketing and implementation plans, customer and program ally communications, and extracts from the program-tracking database. We received extracts from the program-tracking database in January 2014 for evaluation planning and Wave 1 survey sampling, and we received updated data in May 2014 and again in August 2014, after program implementers had finalized the PY6 database.

3.1.3 Participant Surveys

We fielded two waves of computer-assisted telephone interviewing (CATI) surveys with SBDI Program participants. This two-wave approach was necessary given the need for NTGR information prior to March 1, 2014.

Wave 1 Participant Survey

The evaluation team fielded the first wave of the participant survey, which focused on gathering data needed to develop an updated NTGR, in February 2014.[3] We completed interviews with 70 program participants as part of the first wave, and presented the preliminary NTGR results in a memorandum delivered in February 2014 and preliminary process results in a separate memorandum delivered in April 2014.

Sample Design

We developed the sample frame based on an extract of the participant database as of January 24, 2014. The data extract included 688 unique SBDI projects. We dropped projects without a valid phone number and removed duplicate contact names, resulting in 445 projects in our sample frame.

We completed a telephone survey with a random sample of 70 decision makers associated with the 445 SBDI projects. Where the database contained multiple completed SBDI projects for a contact, we selected one project at random for the purposes of asking the detailed free-ridership questions. However, we also asked if the decision-making process was the same for the other projects. This follow-up question provided information for an additional six projects, resulting in 76 free-ridership responses.

Table 4 summarizes key information about sampling for the SBDI Wave 1 survey and completed interviews.

Table 4. Summary of SBDI Wave 1 Survey Sampling and Completes

Population of Completed Projects [a]		Contacts in Sample Frame	Completed Interviews		
Projects	kWh Savings		Contacts	Completed Free-Ridership Modules	kWh Savings
688	7,210,901	445	70	76	866,924

[a] The total number of projects listed reflects the population of paid projects as of January 24, 2014.

Survey Disposition and Response Rate

We fielded the survey with SBDI participants from February 10 through February 18, 2014. Table 5 provides the final survey dispositions.

[3] While AIC requested that the evaluation team conduct NTG research at this time, we also carefully considered whether there was any reason to believe that Wave 1 participants would be systematically different from Wave 2 participants. Based on a review of program implementation over the course of PY6, the team does not believe that there is any reason to suspect differences in the two groups.

Table 5. SBDI Wave 1 Participant Survey Dispositions

Disposition	N
Completed Interviews (I)	70
Eligible Non-Interviews	171
Refusal	43
Mid-Interview Terminate (R)	7
Respondents Never Available (NC)	100
Answering Device	21
Not Eligible (e)	11
Non-Working Number	5
Wrong Number	5
No Eligible Respondent	1
Unknown Eligibility Non-Interview (U)	22
Always Busy	1
No Answer	21
Total Phone Numbers Used	**274**

Table 6 provides the response and cooperation rates. Appendix B provides information on the methodology used to calculate response rates for telephone surveys.

Table 6. SBDI Wave 1 Participant Survey Response and Cooperation Rates

AAPOR Rate	Percent
Response Rate	27%
Cooperation Rate	58%

Wave 2 Participant Survey

The team fielded the second wave of the participant survey in July 2014 and focused on gathering data specific to program processes. In particular, the survey explored the barriers to completing a retrofit project, as well as motivation to participate and the decision-making process.

Sample Design

We developed the sample frame based on an extract of the participant database as of May 15, 2014. The data extract included 2,161 unique SBDI projects, which included both completed projects and assessment-only projects. We dropped projects without a valid phone number, removed projects with duplicate contact names,[4] and removed projects that AIC identified as incomplete. We also excluded all projects that were included in the Wave 1 SBDI participant survey sample frame. The final sample frame included 907 projects, of which 534 were completed projects and 373 were assessment-only projects.

[4] In these cases, we randomly selected a project contact to include in the sample.

We completed a telephone survey with a random sample of 110 decision makers associated with the 907 SBDI projects. We completed 70 interviews with full participants (participants who installed recommended measures through the program) and 40 interviews with partial participants (participants who completed an assessment, but did not install recommended measures through the program).

Table 7 summarizes key information about the sample and completed interviews for the SBDI Wave 2 participant survey.

Table 7. Summary of SBDI Wave 2 Survey Sampling and Completes

Project Type	Population[a]		Contacts in Sample Frame[b]	Completed Interviews
	Projects	Contacts		
Completed Project	1,496	960	534	70
Assessment-Only	665	343	373	40
Total	**2,161**	**1,303**	**907**	**110**

[a] The total number of projects listed reflects the population of paid projects as of May 15, 2014.

[b] The sample frame contains unique contacts and therefore one project per contact.

Survey Disposition and Response Rate

We fielded the survey with SBDI participants from July 9 through July 17, 2014. Table 8 provides the final survey dispositions.

Table 8. SBDI Wave 2 Participant Survey Dispositions

Disposition	N
Completed Interviews (I)	110
Eligible Non-Interviews	486
Refusal	135
Mid-Interview Terminate (R)	7
Respondents Never Available (NC)	256
Answering Device	87
Language Problem (NC)	1
Not Eligible (e)	57
Non-Working Number	23
Wrong Number	14
No Eligible Respondent	18
Business/Government/Other Org.	2
Unknown Eligibility Non-Interview (U)	3
No Answer	1
Call Blocking	2
Total Phone Numbers Used	**656**

Table 9 provides the response and cooperation rates. B provides information on the methodology used to calculate response rates for telephone surveys.

Table 9. SBDI Wave 2 Participant Survey Response and Cooperation Rates

AAPOR Rate	Percent
Response Rate	18%
Cooperation Rate	44%

Weighting

To ensure that responses were representative of the population of projects completed by participants, we developed and applied weights to the process data. For each project type (assessment-only and fully completed projects), we calculated a weight by dividing the project type's share of the project population by its share of responses (see Table 10).

Table 10. Wave 2 Survey Weights

Project Type	Population (Contacts)[a]		Completed Interviews		Weight	
	Total Part.	% Part	Total Part.	% Part	Wanted Interviews	Weight
Completed Project	960	74%	70	64%	81	1.1578
Assessment-Only	343	26%	40	36%	29	0.7239
Total	**1,303**	**100%**	**110**	**100%**	**110**	

[a] The total number of contacts listed reflects the population of customers as of May 15, 2014.

3.1.4 Small Business Program Ally Interviews

The team conducted in-depth interviews with a random sample of 10 SBPAs during July and August 2014. The team drew the sample from a list of active SBPAs who completed at least one project in PY6. Among the group of SBPAs who completed interviews, the total number of projects completed by each ranged from 1 to 120. Further, the team was able to complete interviews with SBPAs in almost all territories.

The in-depth interviews focused on the participation process, barriers to participation, the effect of the program on the companies' business practices, and program ally satisfaction.

3.1.5 Small Business Energy Advisor Interviews

In June 2014, we interviewed six of the seven SBEAs that support the program. We attempted to contact the energy advisors for all seven territories, but ultimately spoke with six, as one energy advisor had left the program. These interviews explored program implementation and processes, as well as perceived barriers to customer participation and customer decision making.

3.1.6 Verification and Due Diligence

We compared the SBDI Program's quality assurance and verification activities with best practices for energy efficiency programs using best practices guidelines.[5] We compared current activities carried out by implementation staff to industry best practices for similar business programs to determine:

- If any key quality assurance and verification activities that should have taken place were not being implemented
- If any of the current quality assurance and verification activities are biased (e.g., incorrect sampling that may inadvertently skew results, purposeful sampling that is not defendable)
- If any of the quality assurance and verification activities were overly time-consuming and could be simplified or dropped

This assessment primarily relied on in-depth interviews with implementation staff and documentation of current program processes. The full review memo is provided in E.

3.2 Analytical Methods

3.2.1 Participation Analysis

The evaluation team analyzed the final PY6 SBDI Program database, focusing on overall participation and conversion rates.[6] We analyzed the types of measures installed through the program, as well as the types of facilities that participated. The participation analysis also involved using ArcGIS to map the location of all program participants who completed a project and analyzing how participation and conversion rates varied by energy advisor territory. However, there were insufficient data available to examine program uptake among targeted customers (analysis of program uptake was outlined in the PY6 evaluation plan).

3.2.2 Gross Impacts

The evaluation team used the following process to determine ex post gross savings:

- **Application Review:** Performed a detailed application review of a random sample of 40 projects. This included reviewing post-inspection records, application forms, and invoices and comparing the documentation with the reported values in the tracking database.
- **Onsite Visits:** Selected 20 of the 40 sampled projects using a cluster sampling approach and performed site visits to assess measure installation.

[5] See the Best Practices Self Benchmarking Tool developed for the Energy Efficiency Best Practices Project: http://www.eebestpractices.com/benchmarking.asp.

[6] The conversion rate is the percentage of small businesses that received an energy assessment that went on to install measures through the program.

- **Database Review:** Reviewed the SBDI database and applied deemed values[7] for measures for which they were available, while calculating savings for remaining measures using the Illinois Statewide Technical Reference Manual (TRM) Version 1.0[8] algorithms and assumptions. The team also used information obtained from the application review and onsite visits to adjust measure installation.

Application Review

The application review consisted of drawing a random sample of 40 projects and comparing project documentation, such as applications and post-inspection records, with information contained within the program-tracking database.

Onsite Visits

From the 40 projects randomly drawn for application review, we selected 20 projects for site visits, using a cluster sampling approach. First, we mapped the locations of the 40 application review projects and grouped them into three geographic clusters. Then we drew a random sample from each cluster and attempted to recruit participants for the site visits. However, due to difficulties getting a sufficient number of participants to agree to a site visit, we ultimately contacted all 40 of the application review projects to try to schedule site visits.[9] Based on this approach, we ended up with equally distributed visits. Specifically, we completed seven site visits in Cluster 1, six visits in Cluster 2, and seven visits in Cluster 3. The visits occurred in August 2014.

Database Review

Table 11 provides the IPA deemed values that the team used to determine ex post program savings. Note that the evaluation team calculated savings for T12 to T8 relamp/reballast and T12 to T8 8 ft. to 4 ft. conversion measures, which are not included below, based on Illinois Statewide TRM for Energy Efficiency Version 1.0.

Table 11. IPA Deemed Electric Savings Values for SBDI Measures

Measure Description	NTGR	Gross kWh	Net kWh	Gross kW	Net kW
CFLs	0.90	129	116	0.03	0.03
LED Exit Signs	0.90	342	308	0.04	0.04
Exit Sign LED Retrofit Kits	0.90	342	308	0.04	0.04
Occupancy Sensors	0.90	731	658	0.19	0.17
Low-Flow Aerators – Kitchen	0.90	885	797	0.22	0.20
Low-Flow Aerators (electric water heat only) – Bath	0.90	82	74	0.02	0.02
Green Nozzle (electric water heat only)	0.90	19,005	17,105	0.00	0.00

Source: IPA filing from Docket 12-0544.

[7] We used IPA Deemed Values for SBDI Measures as stated in the SBDI Evaluation Plan from IPA filing from Docket 12-0544.

[8] State of Illinois Energy Efficiency Technical Reference Manual Version 1.0. Final. September 14, 2012.

[9] In general, the low participant response to site visit requests was due to difficulty reaching project contacts despite numerous attempts, as well as participants declining to take part in site visits because of time constraints or based on hard refusals.

3.2.3 Net Impacts

As outlined in Table 11 above, we applied the NTGR from AIC's IPA filing from Docket 12-0544 for this program (0.90) to calculate PY6 net impacts.

3.2.4 Net-to-Gross Ratio

As part of the PY6 evaluation, the team also gathered data to support the development of an updated NTGR for prospective application for potential IPA programs approved by the Illinois Commerce Commission (ICC) in a docketed proceeding for implementation in PY8 (June 1, 2015–May 31, 2016). The methodology and results of this analysis are included in C.

3.3 Sources and Mitigation of Error

Table 12 provides a summary of possible sources of error associated with data collection conducted for the SBDI Program. We discuss each item in detail below.

Table 12. Possible Sources of Error

Research Task	Survey Errors		Non-Survey Errors
	Sampling Errors	Non-Sampling Errors	
Participant Survey	• Yes	• Measurement errors • Non-response • Data processing errors • External validity	• N/A
Application Review and Site Visits	• Yes	• Measurement errors • Non-response • Data processing errors • External validity	• Data processing errors • Analysis errors
Database Review	• N/A	• N/A	• Analysis errors
NTGR Analysis	• Yes (based on participant survey)	• Measurement errors • Non-response • Data processing errors • External validity	• Analysis errors

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

Survey Errors

- **Sampling Errors**
  - The evaluation team designed both of the telephone survey samples to achieve 90% confidence and ±10% relative precision. For Wave 1, which involved the estimation of the program NTGR, we surveyed 70 customers out of a population of 445. At the 90% confidence level, we achieved a precision of ±6%, assuming a coefficient of variation of 0.50. For Wave 2, which involved assessing program processes, we surveyed 110 customers out of a population of 907. At the 90% confidence level, we achieved a precision of ±8%, assuming a coefficient of variation of 0.50. Note that the

actual precision of each survey question differed, depending on the variance of the responses to each question.

- The evaluation team designed the application review sample to achieve 90% confidence and ±10% relative precision on the impact values. Based on the execution of this approach, at the 90% confidence level, we achieved a precision of ±13%, assuming a coefficient of variation of 0.50. The site visits conducted were a subset of the projects reviewed, and the team used them to enhance the gross impact analysis.

- Non-Sampling Errors

  - **Measurement Errors:** We addressed both the validity and reliability of quantitative data through multiple strategies. First, we relied on the experience of the evaluation team to create questions that, at face value, appear 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 asked about two subjects, but that had only one response) or loaded questions (i.e., questions that were slanted one way or another). We also checked the overall logical flow of the questions so as not to confuse respondents, which would decrease reliability.

    Key members of the evaluation team, as well as AIC and ICC staff, reviewed all survey instruments. In addition, to determine if the wording of the questions was clear, we pretested each survey instrument and monitored the telephone interviews as they were being conducted, and we reviewed the pretest survey data. We also used the pretests to assess whether the length of the survey was reasonable.

  - **Non-Response and Self-Selection Bias:** Given that the response rates for the two waves of the participant survey were 27% and 18%, respectively, there is the potential for non-response bias. However, we attempted to mitigate possible bias by contacting each contact in the sample at least eight times, unless a hard refusal was received, and by calling at different times of the day as appropriate. In addition, the team used all available data at its disposal to assess whether evidence of non-response bias existed. For both Wave 1 and Wave 2 surveys, we compared survey respondents to the population based on facility type and project savings. For both waves, we found that there was not a statistically significant difference between respondents and the population in terms of project savings. However, for Wave 1, there were differences based on facility type, particularly among restaurants and warehouses where we saw a limited response to the survey. We also saw differences in Wave 2 based on facility type, specifically healthcare facilities which represented a very small percentage of respondents to the survey.

  - **Data Processing Errors:** The team addressed processing error through interviewer training, as well as quality checks of completed survey data. Opinion Dynamics interviewers went through rigorous training before they began interviewing. Interviewers received a general overview of the research goals and the intent of each survey instrument. Through survey monitoring, members of the evaluation team also provided guidance on proper coding of survey responses. In addition, we carried out continuous, random monitoring of all telephone interviews and validation of 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 development of an appropriate research design. For the two waves of the participant survey, we drew a random sample from the 445 and 907 customers,

respectively, who participated in the program and completed sufficient surveys to achieve 90% confidence and ±10% relative precision.

Non-Survey Errors

- **Analysis Errors**
  - **Database Review:** We applied the TRM calculations to the participant data in the tracking database to calculate gross impacts. To minimize analysis error, the evaluation team had all calculations reviewed by a separate team member to verify that calculations were performed accurately.
  - **Application Review and Site Visits:** The team took a similar quality assurance approach to the database review when conducting the application review and site visits. To minimize analysis error, the evaluation team had all calculations reviewed by a separate team member to verify that calculations were performed accurately.
  - **NTGR Analysis:** To minimize analysis error, the evaluation team had all the algorithms and calculations reviewed by a separate team member to verify that calculations were performed accurately.

4. Detailed Findings

4.1 Program Description and Participation

The SBDI Program began as a pilot in PY5 and was formally launched in PY6. The program was implemented by Leidos and offered AIC business customers in the DS-2 rate code a free energy assessment, as well as the installation of energy efficient measures. The program offer included a package of free measures, a $129 premium package, and additional measures that go beyond the premium package. The free package includes CFLs, faucet aerators, low-flow shower heads, and pre-rinse spray valves. The $129 premium package includes 42W CFLs, LED exit signs, and lamp/ballast retrofit of up to 80 reduced wattage T8 lamps. The additional measures include occupancy sensors, 8 foot T12 to 4 foot T8 conversion kits, and T12/T8 retrofits exceeding the 80-lamp limit.

Three key entities have roles in program delivery: SBEAs, SBPAs, and distributors.

- **SBEAs:** The AIC service territory is divided into seven energy advisor territories, and one SBEA is assigned to each. The SBEAs are responsible for performing energy assessments, managing the SBPAs, and ensuring that customers are satisfied with their projects. To efficiently cover each territory and maximize word of mouth referrals, the SBEAs generally performed energy assessments in a particular community in each territory and did not move on to another community until that community had been saturated by the program, although this strategy was modified over the course of the program year.

  SBEAs are also involved in the program inspection process. SBEAs inspect the first 10 projects completed by each SBPA, and, after the first 10, they inspect every 15th project. SBEAs also inspect projects if they have more than $5,000 of incentives or if there is an incentive change of $500 or more. During an inspection, the SBEA ensures that the SBPA installed all the correct measures and that the customer is satisfied with the project.

- **SBPAs:** SBPAs are electrical contractors who complete the work orders assigned to them by SBEAs. These work orders are the result of the energy assessments conducted by the SBEAs or in some cases by the SBPAs themselves. SBPAs must be registered program allies in the ActOnEnergy Business Program before they can enroll and receive training as an SBPA in the SBDI Program. The program recruited contractors who would give them good geographical coverage of the territory, as well as those contractors that customers frequently requested through the program. Small business customers are able to select their preferred contractor from a list of the registered SBPAs in their territory. There are currently around 70 registered SBPAs in the program.

  When a SBPA completes an installation, the customer pays the contractor a co-pay amount and then the program pays the contractor an incentive based on the energy efficiency measures installed. Additionally, since October 2013, the program has expanded the role of about a quarter of the SBPAs to include performing energy assessments. Between 15% and 25% of the volume of projects now come from energy assessments conducted by SBPAs, and the program's goal is for SBPAs to take a larger role in performing energy assessments in PY7.

- **Distributors**: Participating distributors support both SBEAs and SBPAs by ensuring the supply of program measures. SBPAs are required to order materials for their SBDI projects from distributors enrolled in the program. Distributors, like SBPAs, must first be registered program allies in the ActOnEnergy Business Program, after which they can enroll and receive training as a distributor for the

SBDI Program. Initially, program staff recruited distributors primarily from the ActOnEnergy Business Program, but, as the contractor list has grown, the program has added more distributors to support the allies. Most of the distributors added were those that SBPAs said that they would like to work with.

There are currently around 15 enrolled distributors located throughout the territory. These distributors are a mix of national, regional, and local companies. Therefore, many of them have multiple branch offices throughout the area. The program expects distributors to have sufficient supply of program measures and to maintain their prices throughout the program year.

The design and delivery of the SBDI Program are intended to overcome barriers specific to small business customers. In particular, a key barrier to program participation for small businesses was the time, effort, and sophistication required to complete the incentive application process. Further, the streamlined process allowed electrical contractors to serve a hard-to-reach market that they might not otherwise be serving. The role that the program, and its SBEAs and SBPAs, played in identifying energy efficiency improvements, identifying a contractor, and handling the application process for the customer were mechanisms for addressing these barriers.

Program Participation

Over the course of PY6, eligible customers completed 2,128 projects through the SBDI Program. Leidos also completed an additional 658 assessment-only projects in which program staff made contact with eligible customers and performed an energy assessment where they identified potential energy saving measures.[10] Table 13 provides a summary of PY6 participation.

Table 13. PY6 SBDI Participation

Project Type	Number of Projects	Percent of Projects
Completed	2,128	76%
Assessment-Only	658	24%
Total	2,786	100%

Section 4.2.2 presents a more detailed analysis of program participation.

4.2 Process Assessment

The evaluation team performed a process evaluation of the PY6 program, focusing on program awareness, program experience, and barriers to participation, as well as program implementation changes. Results are based on in-depth interviews with program staff, SBPAs, and SBEAs, as well as a review of program-tracking data and a participant survey.

4.2.1 Program Design and Implementation

Based on interviews with program staff, implementation of the SBDI Program went smoothly and generally according to plan in PY6. However, the program staff did encounter some challenges over the course of the

[10] Assessment-only projects do not result in completed projects.

year, which they addressed with minor implementation changes. The next section outlines these implementation challenges and changes.

Implementation Challenges and Changes

In the first year of full operation, the SBDI Program confronted and overcame a number of challenges. These challenges included the following:

- **Customer Mistrust of Utilities:** A major challenge in implementing the SBDI Program came from Alternate Retail Electric Suppliers (ARES), who contact businesses throughout the AIC service territory to try to convince them to switch to their electric service. The activities of the ARES led to a strong distrust of utility companies in the region and presented a challenge to the SBDI Program because program implementers needed to develop relationships with many of these businesses so that they would trust and participate in the program. Program implementers worked to counteract this distrust by developing relationships with target customers by collaborating with community organizations, such as the Chambers of Commerce. Another way that the program worked to develop customer trust was by ensuring high levels of satisfaction with the program. Satisfied participants helped spread the word about the program and its positive impacts.

- **Challenges Communicating Projected Project Costs:** The cost of the packages offered by the program posed another challenge during PY6. In particular, early in the program year, the final cost of customer projects took some participants by surprise because the quote that they had received did not include sales tax or the costs of recycling the equipment that the contractor removed from their facilities. Given that these additional costs were not included in the quote, some participants felt that the information that they had initially received was deceiving. To resolve this issue, the program now includes recycling fees as part of the incentive covered by the program. In addition, following the energy assessment, the SBEA or SBPA now informs the customer that sales tax is not included in the price and will be added later. Further, the customer is not asked to sign off on the work order until the sales tax information is provided.

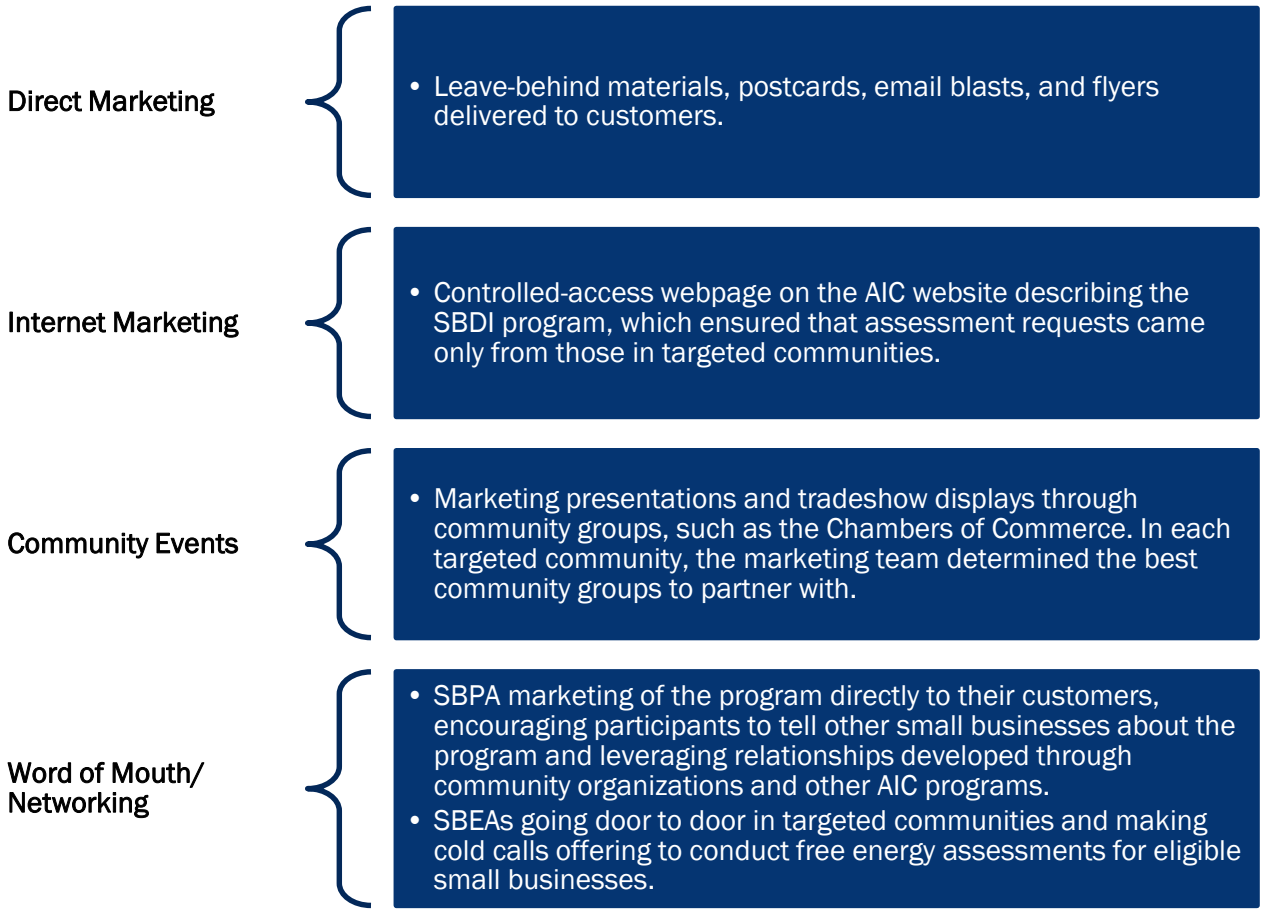
- **Recruiting SBPAs to Conduct Energy Assessments:** The program also encountered some difficulty in taking initial steps toward integrating SBPAs into the energy assessment process during PY6. Among SBEAs, there was a feeling that there were not enough SBPAs who could perform energy assessments. In particular, SBEAs had difficulty recruiting SBPAs who wanted to complete assessments in addition to installations because the SBPAs did not receive an incentive for performing the assessments. In general, larger contractors have the capacity and resources to perform assessments, but smaller contractors do not. As a result, without an incentive to perform the energy assessments, many SBPAs would rather tell the SBEAs about any leads they get and then have the SBEA complete the assessment. Program implementers have addressed this issue in PY7, and SBPAs now receive an incentive to complete energy assessments for the program.

Marketing and Outreach

Overview of Marketing and Outreach Activities

The SBDI Program took a community-based implementation approach where the program targeted specific communities and concentrated on them until they were saturated. As a result, program staff used targeted marketing and outreach efforts. In general, program staff relied on the communication channels presented in Figure 1.

Figure 1. SBDI Communication Channels



In addition to the core strategies presented above, program implementers ran promotions during the program year to generate interest in the program. In particular, they ran the Small Business Rivermen E-mail promotion, two iPad promotions, and community blitzes.

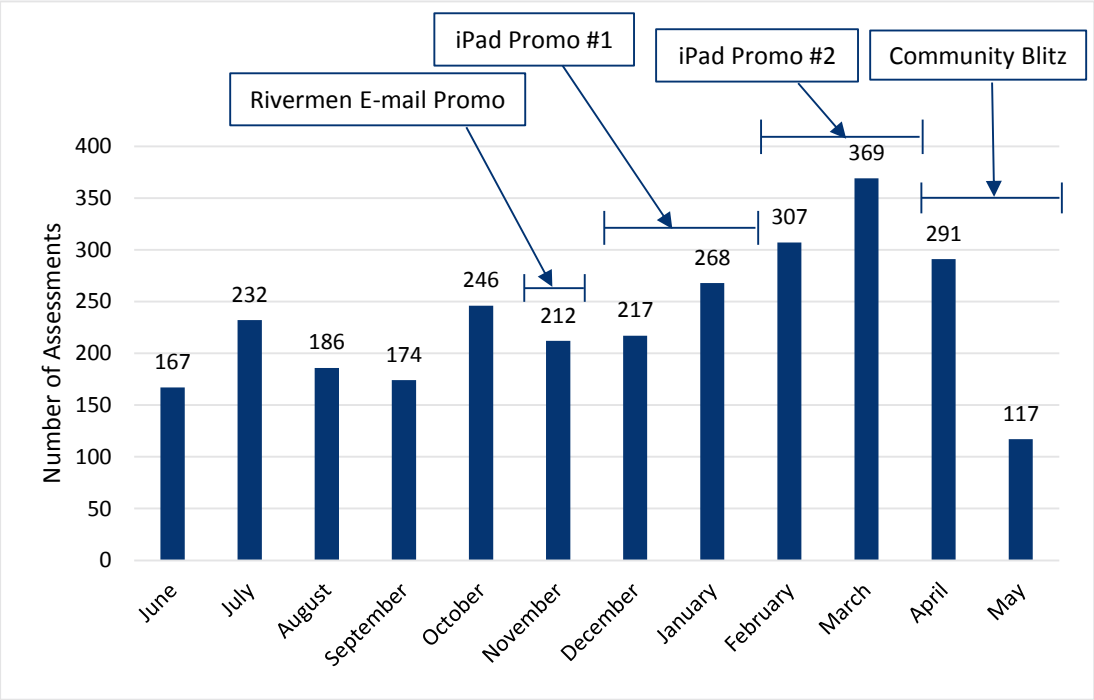
The Rivermen E-mail promotion involved sending emails to approximately 1,200 DS-2 customers in the Peoria area. For the two iPad promotions, one during December/January and another during February/March, program implementers raffled off iPads. They advertised these promotions on direct marketing materials, which gave customers three options to respond: fill out an assessment request form on the website, call in to request an incentive, or mail a request back with prepaid postage. They also advertised the promotions through Chambers of Commerce and program ally co-branded flyers. Once a customer completed an assessment, program staff entered the customer to win an iPad.

Overall, these iPad promotions worked well in generating assessment requests. For the December/January promotion, program implementers sent postcards to 11,979 DS-2 customers, and 231 small businesses responded to sign up for an assessment. During the February/March promotion, program implementers sent postcards to 17,812 customers, resulting in 235 small businesses signing up for a free energy assessment. Overall, these promotions generated 466 energy assessments and more than half (56%) of the requests came through business reply cards.

The program also conducted two community blitzes in April and May. The first community blitz was in Metro East and East Peoria, while the second was in Ottawa, Metro East, and some small towns in the Quincy and South Illinois territories. These community blitzes involved sending out emails and direct mail, Chambers of Commerce ads, and community outreach.

While the team can directly link only the iPad promotions to increased energy assessments, based on the number of customers who responded to the raffle as outlined above, Figure 2 shows the number of assessment requests made by eligible small businesses each month over the course of the program year. It is clear that there was a spike in energy assessment requests in February and March, which coincided with the second iPad promotion.

Figure 2. Number of Assessment Requests Per Month



Note: The evaluation team used "Application Received Date" to assign projects to months.

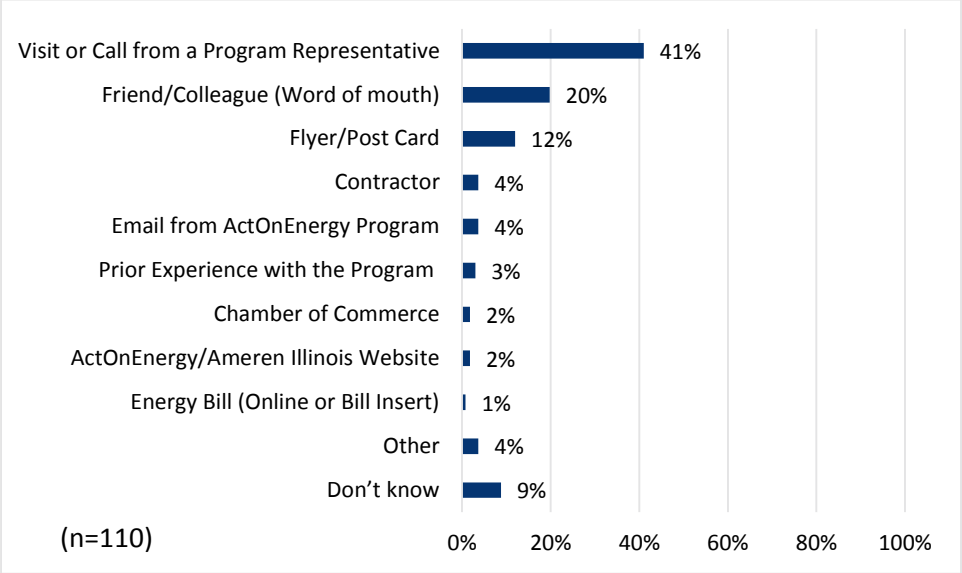
Another marketing and outreach strategy employed by program implementers was the use of case studies during the program year. The program implementation team selected three different customers who had been involved in the SBDI Program and described what they had done and how it had led to energy savings at their businesses. These case studies allowed AIC to highlight real examples of small businesses that saved energy through the program.

The one marketing-related challenge that the program encountered had to do with the emphasis placed on the lower-cost program package. Marketing materials generally focused on the $129 package offered through the program, while the cost of most projects exceeded this amount. This caused many customers to feel that the program used the $129 offering to get in the door. Program implementers are addressing this issue in PY7.

Program Awareness

Within the context of the marketing strategy employed for the SBDI Program, the team assessed sources of program awareness with PY6 participants. Slightly fewer than half of the participants first heard about the program from a program representative visit or call (41%). As is shown in Figure 3, the next largest sources of awareness were word of mouth (20%) and flyers/postcards (12%). These sources of awareness are consistent with the marketing strategy implemented by program staff. While only 1% of participants reported first hearing about the program through the Chambers of Commerce, they were also an important means for the program to educate various communities.

Figure 3. How SBDI Participants First Heard About the Program



Interviews with SBPAs reinforced the notion that direct outreach through visits or calls to customers was one of the most effective ways to educate them about the program. In particular, the SBPAs with whom we spoke reported that most of their customers had never heard of the program, and that they found that the best way to market the program was to speak directly with the decision makers at these small businesses, as marketing materials often did not make it to the appropriate person. Furthermore, SBEAs reported that word of mouth was a very strong tool for the program. According to SBEAs, participants were more likely to install measures through the program if they learned about the program from someone they knew.

4.2.2 Program Participation

Participant Characteristics and Conversion Rate

The program saw participation across a wide range of facility types. Retail/service facilities and offices each made up about a third of participating businesses (33% and 32%, respectively). Other facility types that completed projects were religious worship/church facilities (8%), restaurants (6%), and health care clinics (6%). Table 14 shows all the facility types of the customers who participated in the SBDI Program.

Table 14. Participant Facility Types

Facility Type	Number of Projects	Percent of Projects
Retail/Service	710	33%
Office	688	32%
Religious Worship/Church	168	8%
Restaurant	129	6%
Health Care Clinic	118	6%
Miscellaneous	104	5%
Warehouse	94	4%
Light Industry	66	3%
Grocery	11	1%
Hotel/Motel Guest Room	11	1%
Elementary School	6	0%
Hotel/Motel Common Area	6	0%
College/University	4	0%
Multifamily Common Area	4	0%
Hospital	4	0%
Low-Use Small Business Miscellaneous	4	0%
Heavy Industry	1	0%
Total	**2,128**	**100%**

The program was also able to achieve participation across the AIC service territory. As shown in Table 15, in terms of absolute numbers, the program saw the highest level of participation in Quincy and the lowest level in East St. Louis.

Table 15. SBDI Participation by Energy Advisor Territory

Territory	Completed Projects	Percent of Completed Projects
Quincy	478	22%
North Champaign	396	19%
South Illinois	364	17%
West Peoria	283	13%
South Champaign	219	10%
East Peoria	210	10%
East St. Louis	178	8%
Total	**2,128**	**100%**

The implementers also achieved a relatively high conversion rate. In particular, eligible small business customers completed 2,128 projects through the SBDI Program while an additional 264 entered the pipeline as pre-approved projects. Table 16 shows the resulting program conversion rate of 68%.[11]

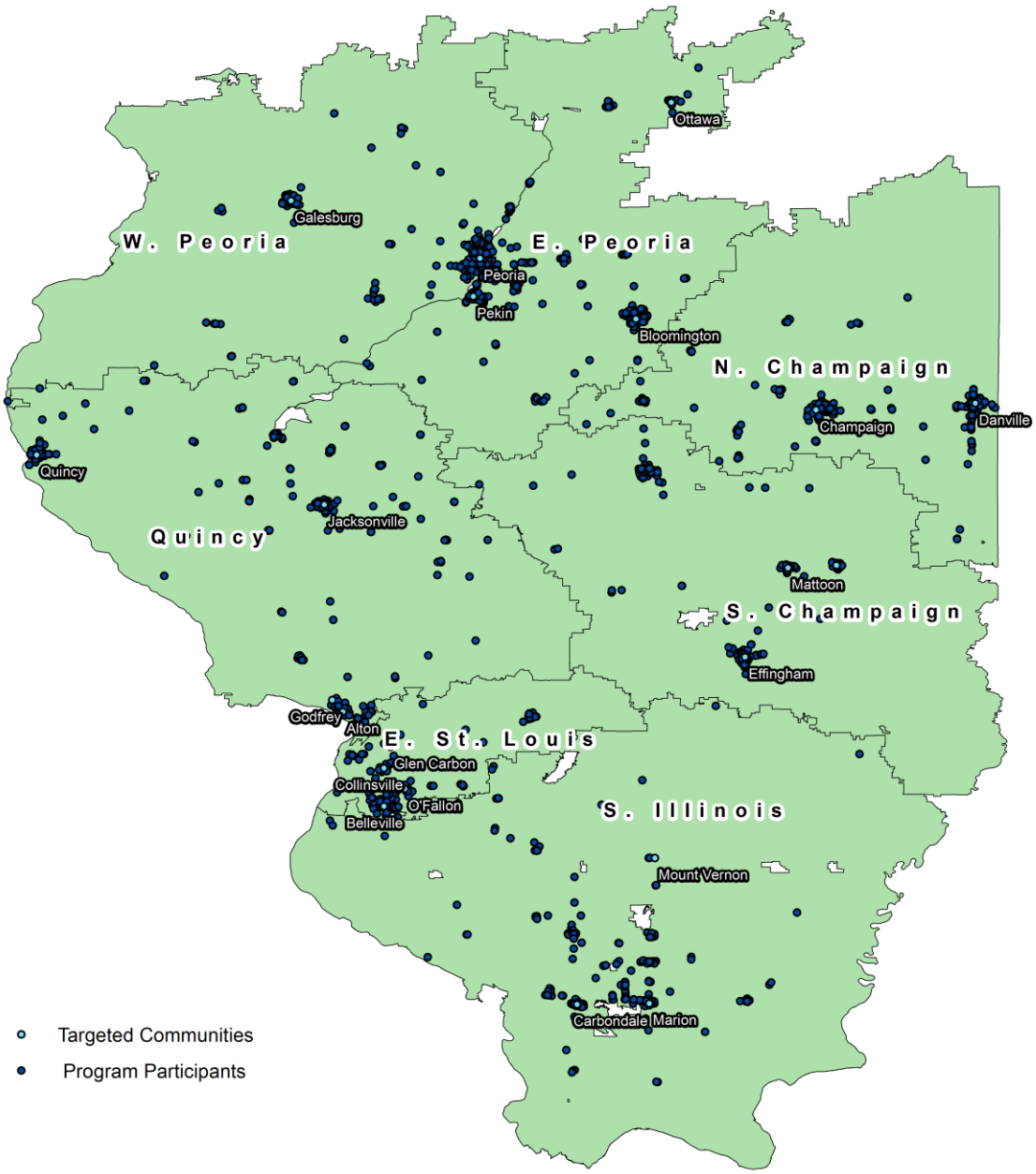
Table 16. SBDI Participation and Conversion Rate

Participation	Number of Projects
Paid & Invoices Received	2,128
Total Projects	3,144
Conversion Rate	68%

Figure 4 shows the location of all program participants who completed projects. Figure 4 also illustrates the community-based approach taken by the program, as the majority of program participants were near the program's targeted communities.

[11] We calculated the conversion rate by taking the number of converted projects (based on paid and invoices received) and dividing it by the total number of energy assessments completed.

Figure 4. Participation by Energy Advisor Territory



Measure Installation

Fluorescent lighting retrofit products were the most popular measures installed through the program. Almost all projects (95%) involved fluorescent lighting retrofits. More than two-thirds of projects (69%) involved the installation of CFLs, making it the second most frequent measure type installed through the program. Projects involving the installation of exit/emergency signs (28%) and delamping (17%) were also popular.

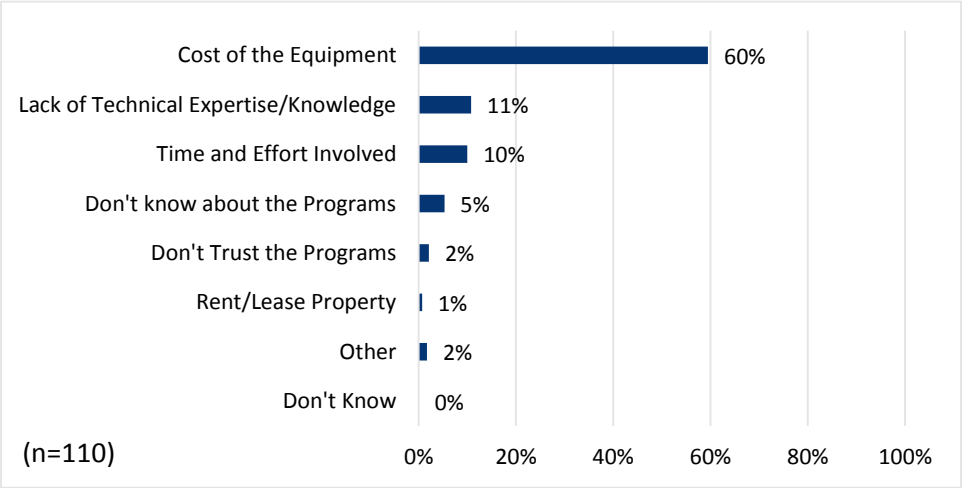
Table 17. Measures Installed by Participants

Measure Type	Number of Completed Projects	Percent of Completed Projects
Fluorescent Lighting Retrofit	2,015	95%
CFLs	1,470	69%
Exit/Emergency Signs	590	28%
Delamping	362	17%
Hot Water Conservation Measures	180	8%
Occupancy Sensors	48	2%

Barriers and Motivations to Participation

Equipment cost is the largest barrier to installing energy efficient equipment among small business customers. As shown in Figure 5 below, more than half of the participants (60%) reported cost as the main factor preventing small businesses from installing energy efficient equipment. Other factors included lack of technical expertise and knowledge of what to install (11%), the time and effort involved (10%), and a lack of knowledge about the programs available (5%). The SBDI Program design addresses each of these barriers by providing discounted equipment and delivering the program directly to the customer.

Figure 5. Barriers to the Installation of Energy Efficient Equipment (Multiple Response)



However, in assessing the experience of customers who installed none or only some of the recommended equipment, it is clear that, despite program assistance, cost continued to be a barrier for some customers. For example, while 90% of respondents who went on to install measures through the program decided to install all of the measures, those who did not cited two reasons: financial constraints (n=4) and the fact that the contractor was unable to install some of the measures (n=2).

Additionally, among those who only received an energy assessment, 43% reported that the recommended equipment was too expensive. Table 18 shows the other reasons mentioned by partial participants for not installing recommended equipment, which included that they were remodeling/moving (13%), that they did not believe the equipment was necessary (10%), and that it took too long to install the equipment (10%).

Table 18. Reasons Assessment-Only Customers Did Not Install the Recommended Equipment (Multiple Response)

Reason	Percent of Participants (n=34)[a]
Too expensive	43%
Remodeling/moving	13%
Did not believe equipment was necessary	10%
Too much time needed to install equipment	10%
Too much time for energy savings to overcome costs	3%
Concerns about equipment performance	3%
Could not get corporate approval	3%
Not worth required effort and planning	3%
Rent/lease property	3%
Other	5%
Don't know	8%

[a] Six of the assessment-only customers said that they did install the equipment so they are not included in the responses.

As expected based on reported barriers to participation, the greatest motivator for small businesses to install energy efficient equipment is saving energy or saving money on energy bills. More than three-quarters of participants who installed equipment through the program (79%) said that they were motivated to install the equipment by saving energy or saving money on their energy bills (Table 19). Participants also reported that they installed the equipment because of the discounts on the equipment (13%), the lack of availability of old lighting (9%), and the fact that their equipment needed replacement because it was old or failing (6%).

Table 19. Reasons for Installing the Equipment (Multiple Response)

Reason for Installation	Percent of Full Participants (n=70)
Wanted to save energy/money on bills	79%
Discount on equipment	13%
Lack of availability of old lighting	9%
Equipment needed replacement	6%
Other	1%
Don't know	1%

4.2.3 Participant Experience and Satisfaction

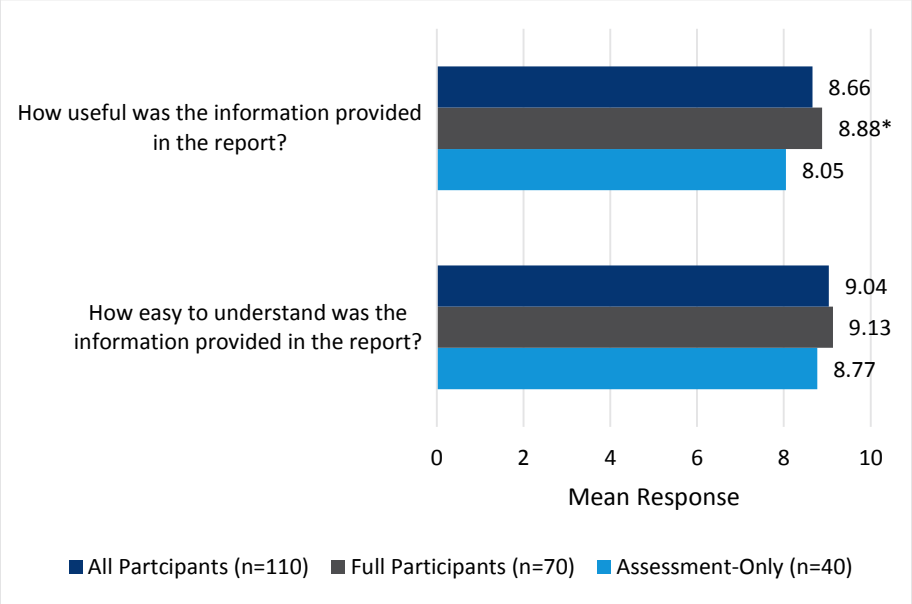
The SBDI Program achieved very high customer satisfaction and contributed to a positive perception of AIC among small business customers.

Participation Process

One of the main goals of the SBDI Program is to make it easy for small businesses to participate and limit hurdles to participation by delivering the energy efficiency measures directly to the customer in a turnkey manner. The program succeeded in overcoming some key barriers to program participation for small businesses, including the time, effort, and sophistication required during the application process. For example, indicators of the ease of participation include the fact that fewer than 1% of participants reported that the participation process for the SBDI Program was not clearly explained to them. Further, none of the participants had difficulty scheduling their energy assessment.

Respondents also found the information provided to them through the energy assessment easy to understand and useful. The vast majority of respondents (94%) found the information provided to them in the assessment report very easy to understand (score of 7–10 on a 10-point scale, where 0 is "Very Difficult" and 10 is "Very Easy"), and none of the participants found the information difficult to understand (score of 0–3). When asked to rate how useful the information provided through the energy assessment report was, more than four-fifths of respondents (85%) reported that the information was very useful (score of 7–10 on a 10-point scale, where 0 is "Not At All Useful" and 10 is "Very Useful"). Respondents who installed some of the program measures gave a significantly higher rating than respondents who only received an energy assessment (mean responses of 8.88 and 8.05, respectively), as shown in Figure 6.

Figure 6. Respondents Ratings of Information Provided in the Energy Assessment Report



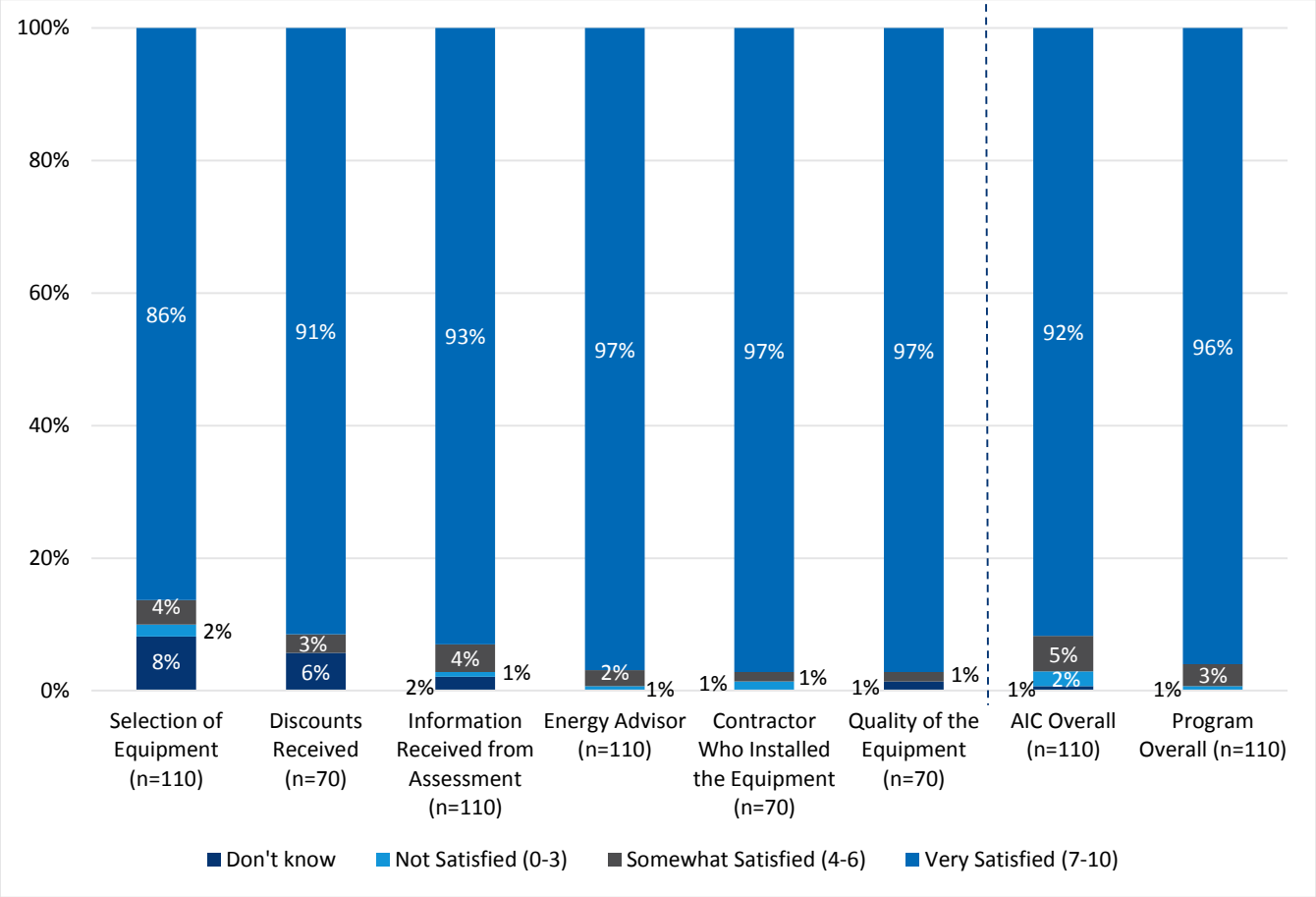
* Statistically significant at the 10% level compared to assessment-only.

Program Satisfaction

Overall, Leidos succeeded in developing a program that worked well for eligible customers. Almost all participants (95%) were very satisfied with the SBDI Program overall, as well as with AIC. In addition, as shown in Figure 7, very few respondents were dissatisfied with any of the program components. However, while their scores are still relatively high, participants who only received an assessment gave significantly lower mean satisfaction ratings for many of the program components than participants who installed measures through the program. For example, mean satisfaction ratings for the information received during the energy

assessment (8.6 v. 9.3), the energy advisor (8.9 v. 9.6), the selection of the equipment (8.2 v. 9.3), and the program overall (8.4 v. 9.5) were significantly lower for participants that only received an assessment.

Figure 7. Satisfaction with SBDI Program Components



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

Another indicator of high program satisfaction is the fact that almost all participants (95%) would recommend this program to other small businesses. However, there were differences between full participants and those who only received an assessment. In particular, all of those who installed measures through the program said that they would recommend this program to other small businesses, compared to 83% of respondents who only received an energy assessment.

4.2.4 Program Ally Experience and Satisfaction

Overall, program implementers were very successful in recruiting program allies (SBPAs) to participate in the SBDI Program and ensuring that they were satisfied with the program.

Benefits and Challenges to Participation

Participation in the SBDI Program brought both benefits and challenges for SBPAs. The two main benefits reported by program allies were that the program gave them fill-in work when they are not busy and that the

program helped them get their "foot in the door" at customers that they normally would not reach. The majority of the SBPAs we interviewed also said that the SBDI Program allowed them to conduct more business with small businesses and that the program led to more follow-up business with these small businesses as well.

However, there were also challenges for the SBPAs participating in the program. The main challenge reported by SBPAs was the low profit margins for the equipment they installed through the program. More specifically, many contractors had a difficult time making the work they completed through the program profitable due to their labor costs. In addition, some allies stated that the paperwork they had to complete for each project, including receipts and invoices from distributors, recycling taxes, and 1099s, could be very time consuming.

Program Satisfaction

The majority of SBPAs that we interviewed expressed satisfaction with the program (8/10) and noted that they plan to continue to participate. In contrast, two SBPAs said that they were not satisfied due to low profit margins and what they perceived to be the time-consuming nature of the program. These two SBPAs were not sure if they will participate in the program in the future.

4.2.5 Recommendations for Program Improvement

We collected recommendations for program improvement from participating small businesses, SBPAs, and SBEAs. Overall, recommendations across the three groups focused on efforts to raise awareness of the program and expand the measures offered. In addition, SBPAs offered a process improvement related to completing energy assessments.

Among participants, the majority (68%) did not feel that the program needed to be changed. However, among those who made recommendations for improvement, suggestions included greater publicity (7%), greater discounts (5%), and more education about the program (5%). Some respondents also suggested the addition of more measures, which is something program implementers are addressing in PY7.

Table 20. Suggestions for Program Improvement from Participants (Multiple Response)

Suggestion for Improvement	Percent of Participants (n=110)
No recommendations	**68%**
Greater publicity	7%
Greater discounts	5%
More education about the program	5%
More measures	4%
More contractor options	4%
Financing	2%
Other	5%
Don't know	4%

In addition, both SBPAs and SBEAs recommended offering more measures through the program, specifically LEDs. SBEAs also recommended recruiting more program allies to perform assessments for the program, which is something program staff is working on in PY7 by providing SBPA incentives for completing assessments. Further, SBPAs and SBEAs both recommended increased marketing of the program.

A final recommendation made by SBPAs was that program staff tell them what companies qualify for energy assessments and where assessments have already been completed. They reported that it is difficult for contractors to efficiently complete energy assessments because they are often targeting businesses that do not qualify for the program or businesses that have already participated. As such, it would be very helpful to SBPAs that complete energy assessments to know whom they should be targeting.

4.3 Impact Assessment

4.3.1 Gross Impacts

Overall, total gross energy and demand impacts for the SBDI Program were 24,188 MWh and 4 MW.

Measure Verification

Application Review

The first aspect of verifying measure installation involved an application review, which consisted of choosing a random sample of 40 projects and comparing project documentation such as applications and post-inspection records with information contained within the database. Table 21 displays the verification rates from the application review by measure type.

Table 21. Install Rate from Application Reviews

Equipment Description	Quantity in Database	Quantity in Project Documentation	Application Review Verification Rate
Aerators	26	28	107.7%
CFLs	438	422	96.3%
Delamping	2,054	1,953	95.1%
LED Exit Signs	34	34	100.0%
Occupancy Sensors	1	1	100.0%
T12 to T8 Fixtures	1,545	1,556	100.7%
Total	**4,098**	**3,994**	**97.5%**

It is important to note that one delamping project out of the original sample listed 216 delamping units in the tracking database, but only 115 on the application. This discrepancy significantly reduced the verification rate for delamping measures (to approximately 60%) as this was the largest delamping project and there were only 7 delamping projects in the original sample of 40 projects. Because delamping can be very difficult to verify and we did not want to inappropriately reduce the verification rate based on one site, we added another source of information. We reviewed a random sample of an additional 15 delamping measures for large delamping projects (i.e., greater than 50 delamping units) from the database and verified that all 15 matched exactly between the database and applications. We factored this additional sample into the verification rate bringing the rate for delamping measures up to approximately 95%.

Site Visits

Table 22 summarizes the installation rates obtained from the site visit process (n=20) by measure type. One project included four aerators in the database and application, but during the inspection we learned that only two of the four aerators were installed, resulting in the low install rate for aerators. Further, 3 of the 20 sites

contained delamping measures and we were unable to easily confirm the delamping measure quantity, as it requires verifying the before and after quantity of lamps in each fixture. The current description of "Delamping – T12 Standard" does not provide enough information on what type of fixture received the delamping measure, making it nearly impossible to confirm during a site visit. We recommend that future program years include additional information on delamping measures (e.g., pre-install pictures, descriptions of the number of lamps in previous fixture and number of lamps in new fixture). However, for the PY6 evaluation, we decided to give a 100% install rate for delamping measures since we could not confirm the number of lamps in the previous fixture while onsite.

Table 22. Installation Rate from Site Visits

Equipment Description	Quantity			Site Visit Install Rate (Site Visit/Project Documents)
	Database	Project Documents	Site Visit	
Aerators	4	4	2	50.0%
CFLs	258	242	234	96.7%
Delamping	222	121	121	100.0%
LED Exit Signs	12	12	12	100.0%
T12 to T8 Fixtures	683	680	680	100.0%
Total	**1,179**	**1,059**	**1,049**	**99.1%**

Overall Install Rate

Combining the results of the application reviews and site visits, the evaluation team developed an install rate by measure type, as well as an overall install rate. Table 23 summarizes the install rates for the various measure categories that were included in the 40 sampled projects.

Table 23. Overall Installation Rate

Equipment Description	Total Quantity Reviewed[a]	Confirmed Quantity[b]	Install Rate
Aerators	30	30	100.0%
CFLs	680	656	96.5%
Delamping	2,175	2,074	95.4%
LED Exit Signs	46	46	100.0%
Occupancy Sensors	1	1	100.0%
T12 to T8 Replacements	2,225	2,236	100.5%
Totals	**5,157**	**5,043**	**97.8%**

[a] Original quantity is a combination of the database quantity (from the application review) and application quantity (from the site visit verification).

[b] Confirmed quantity is a combination of the confirmed totals from the application reviews and site visits.

In terms of applying these values, for measures types included in the 40 sampled projects, we applied the measure-specific install rates to the overall population when determining ex post gross savings. For measures not included in the 40 sampled projects (e.g., low-flow shower heads), we applied the overall install rate.

Database Review

The database review consisted of applying deemed savings values and estimates from the Illinois TRM Version 1.0 to estimate ex post gross savings. Deemed savings values and specific calculations can be found in D. We included all projects from the database that had an application status of "Paid" or "Invoices Received" during PY6, which amounted to 2,128 applications. The evaluation team used the installation rates from Table 23 to adjust the number of measures in the database when calculating ex post gross savings.

Overall Gross Impacts

Table 24 summarizes PY6 gross impacts associated with the SBDI Program based on TRM algorithms and deemed savings numbers.[12] We explain potential reasons for differences between ex ante and ex post gross impacts following the table.

Table 24. SBDI PY6 Gross Impacts

End Use Category	Adjusted Quantity[a]	Ex Ante Gross		Ex Post Gross		Realization Rate[c]	
		kW	kWh	kW	kWh	kW	kWh
Aerators (electric)	124	3	15,823	2	10,168	91%	64%
CFLs	27,546	915	3,975,348	826	3,553,461	90%	89%
Delamping	11,794	556	3,090,553	531	2,947,038	95%	95%
Green Nozzles (electric) [b]	6	0	0	0	111,509	–	–
LED Exit Signs	1,718	81	616,191	69	587,556	84%	95%
Shower Heads (electric) [b]	1	0	0	0	210	–	–
Occupancy Sensors	134	1	18,664	25	97,954	1,924%	525%
T12 to RWT8 (1-lamp)	2,160	42	220,832	45	280,032	106%	127%
T12 to RWT8 (2-lamp)	21,844	607	3,378,153	641	4,066,241	106%	120%
T12 to RWT8 (3-lamp)	1,655	72	425,282	72	464,329	101%	109%
T12 to RWT8 (4-lamp)	27,033	1,626	9,096,841	1,717	10,816,430	106%	119%
8-foot T12 to HPT8 (2-lamp)	328	4	22,821	4	24,566	96%	108%
8-foot T12 to HPT8 (4-lamp)	5,945	184	988,828	172	1,034,778	93%	105%
Total	**99,891**	**4,099**	**21,906,724**	**4,105**	**23,994,273**	**100.1%**	**109.5%**

[a] Adjusted quantity is the actual number of measures (e.g., light fixtures, faucet aerators) installed and adjusted by the measure-specific install rate.

[b] Green nozzles and shower heads did not have ex ante savings, so the realization rate is not calculated.

c Due to rounding, not all realization rates equal ex post gross savings divided by the ex ante gross savings.

There are several potential reasons for discrepancies between ex ante and ex post gross savings. These reasons include:

[12] Therm impacts resulting from the installation of measures funded by 8-104 are presented within the C&I Standard Program Evaluation Report.

- Ex post impacts for occupancy sensors are significantly higher than ex ante savings. While it is not clear what assumptions were used to determine the ex ante savings, the fact that the team used a deemed number for ex post savings could be contributing to the difference.
- Ex ante savings estimates included electric savings for aerators installed on gas water heating systems. However, the team verified with the implementer that this was an error, and the team did not claim any electric savings for these measures in the ex post analysis.
- Ex ante did not claim any energy savings for green nozzles or shower heads (with electric water heaters). Ex post calculations include these savings, but they account for less than 0.5% of the overall SBDI program savings.
- For low-flow aerators, we confirmed that the implementer assumed that the measures were installed on bathroom sinks. We used the same assumption, but the fact that we are using deemed values as opposed to the TRM algorithm (per the evaluation plan) led to a somewhat lower realization rate for this measure.
- Given that we did not have a deemed number for delamping measures and the TRM Version 1.0 does not contain a delamping measure, we reviewed the ex ante savings on a per-measure basis (i.e., by dividing ex ante savings by the number of measures in each project). Ex ante savings resulted in a range of 14W–81W saved per fixture, which appears reasonable for a delamping project. As a result, we decided to use the ex ante savings for delamping measures, as they fit within the expected range of savings and did not have a deemed number or TRM algorithm to apply.
- For T12 relamp/reballast to RWT8 measures, the ex post savings are slightly higher than ex ante. We used the same table from the TRM as the implementer,[13] so the team is unsure what is causing the slight difference in estimated savings.
- We used the TRM assumptions for T12 to T8 and low-flow shower head measures. We outline these assumptions in more detail in D. The evaluation team reviewed several different sources for baseline wattage assumptions of the T12/T8 8-foot lamps. After reviewing different assumptions, we decided to use the most conservative value, which aligns with the ex ante assumptions and comes from the TRM. We document the three different sources we reviewed in D.

4.3.2 Net Impacts

In determining the overall net savings associated with the SBDI Program, the team applied the NTGR stipulated in the IPA filing (0.90). As a result, the program achieved high net realization rates of 101% for demand and 110% for electric energy.

Table 25. SBDI Program Net Impacts

Program	Ex Ante Net Impacts		Ex Ante NTGR	Ex Post NTGR	Ex Post Net Impacts	
	MW	MWh			MW	MWh
SBDI	4	19,716	0.90	0.90	4	21,769
				Net Realization Rate*	1.01	1.10

[13] TRM Version 1.0 Table A-2 on page 240. Assume baseline F40T12 w/EEMag Ballast.

* Net realization rate = ex post net value ÷ ex ante net value.

We provide the results of our NTGR analysis for future application in C.

4.4 Conclusions and Recommendations

The SBDI Program completed a successful year in terms of program satisfaction and goal attainment. During the program year, program staff adjusted the implementation processes to ensure customer satisfaction with the program, as well as SBEA and SBPA satisfaction. The program implementation team was also able to deliver a program that was easy to participate in and helped customers overcome barriers to participation by offering free energy assessments, handling the application process, and identifying a contractor for the customer. These actions undoubtedly led to customer reported satisfaction with every component of the SBDI Program.

The high levels of program satisfaction seen in PY6 have likely helped raise awareness of the program through word of mouth. In addition to this channel, the Chambers of Commerce, as well as direct outreach through SBEAs and SBPAs, was effective in building trust among eligible customers. It is also important to note that program implementers achieved high conversion rates across AIC's territory and managed a geographic rollout that left potential for program success in future years.

Based on the team's PY6 evaluation activities, we make the following recommendations for the program:

- **Explore the feasibility of increasing program incentives and offering more measures through the program.** The greatest barrier to installing energy efficient equipment cited by participants was the cost of the equipment, and even some full participants reported that they did not install all of the measures due to the cost of the equipment. Another recommendation made by participants, SBPAs, and SBEAs alike was to increase the types of measures available through the program, specifically LEDs.

- **Inform SBPAs of the small business customers who are eligible to participate in the program and the customers who have already been targeted.** The process of giving SBPAs the opportunity to conduct energy assessments worked well in PY6. However, program allies reported that they were often approaching small business customers who had already participated in the program or were not even eligible to participate in the program. SBPAs would be able to conduct energy assessments more efficiently if they knew which small business customers were eligible to participate and which customers were already targeted by the program.

- **If the program would like to determine the program uptake rate in the future, targeted customers need to be tracked during the program year.** To determine how many targeted customers go on to complete energy assessments, the evaluation team needs to know who was targeted through the program. This would include customers who were directly sent marketing materials, as well as customers who were approached by SBEAs and SBPAs to participate in the program.

- **Continue to prioritize transparency in addressing program costs.** Program implementers did a great job of adjusting the program implementation so that participants were notified of additional project costs, such as sales taxes and 1099s. Additionally, program staff recognized that they over-focused advertising on the $129 program package. It is important for the program to continue to be transparent about program costs so that it can continue to develop trust with its customers.

A. Appendix – Data Collection Instruments

The following files contain the SBDI participant surveys, as well as the SBEA and SBPA interview guides.


AIC PY6 SBDI Wave 1 Part Survey - FINAl


AIC PY6 SBDI Wave 2 Part Survey - FINAl


AIC PY6 SBDI SBPA Interview Guide FIN.


AIC PY6 SBDI SBEA Interview Guide FIN.

B. Appendix – Survey Response Rate Methodology

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).[14] For various reasons, we were unable to determine the eligibility of all sample units through the survey process and chose to use AAPOR Response Rate 3 (RR3). RR3 includes an estimate of eligibility for these unknown sample units. The formulas used to calculate RR3 are presented below. The definitions of the letters used in the formulas are displayed in the Survey Disposition tables in Section 3.1.3.

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

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

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:

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

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

[14] *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.

C. Appendix – NTGR Results

The evaluation team provided the PY6 NTGR results for the SBDI Program to AIC via memorandum on February 27, 2014. The following sections outline the methodology and results of the NTGR analysis.

NTGR Evaluation Methods

The preliminary assessment of the NTGR for the SBDI Program was based on self-reported information from interviews with participants. The survey was conducted in February 2014 and included program participants through January 24, 2014. In future PY6 evaluation efforts for this program, we will conduct interviews with trade allies. Among other topics these interviews will also include questions about attribution.

The preliminary NTGR for the SBDI Program is defined as:

$$NTGR = 1 - Free\text{-}Ridership + Participant\ Spillover$$

Free-Ridership

We asked SBDI participants a series of questions that explore the influence of five program components in making the energy efficient lighting installations and likely actions that they would have taken had the program not been available. For respondents who have more than one facility with a completed project, we asked these questions for only one randomly selected project.

The free-ridership questions focus on lighting equipment installed through the SBDI Program. While a few projects also included water conservation measures (aerators, low-flow shower heads, and pre-rinse sprayers), those measures contributed less than 0.1% to ex ante (i.e., program-reported) SBDI savings.

Influence of Program Components

We asked respondents to rate the influence of five program components on their decision to make the energy efficient lighting improvements to their facility:

1. The discount on the installed equipment
2. That it was easy to participate
3. The information about energy and financial savings provided through the energy assessment or the energy advisor
4. Other information provided by the program or the energy advisor
5. Information they received from other small businesses that participated in the program.

These questions were asked on a scale of 0–10, where 0 is "not at all important" and 10 is "extremely important."

The *Program Component*s part of the free-ridership score was calculated as:

$$FR\ Score_{ProgComp} = 1 - (Maximum\ rating\ of\ any\ of\ the\ five\ components\ /\ 10)$$

The *Program Components* free-ridership scores thus range from 0 (0% free-ridership, 100% program attribution) to 1 (100% free-ridership, 0% program attribution). Greater influence of the program components means a lower level of free-ridership.

Likely Action without Program

We asked respondents a series of questions about the improvements for which they received a discount through the SBDI Program. We first asked how likely it is that the respondent would have made the improvement without the program (independent of the efficiency level). Participants who responded "not very likely" or "not at all likely" skipped to the final question in the free-ridership module (asking about other projects, if applicable).

Respondents who said they would have been "very likely" or "somewhat likely" to install the discounted measures without the program were asked a series of follow-up questions about the likely quantity, efficiency, and timing of the improvements, if they had happened without the program.

1. **Quantity:** We asked if they would have installed the same quantity of lighting equipment or would have installed less without the program. If less, would they have installed approximately 25%, 50%, 75%, or another amount of what they installed through the SBDI Program?

2. **Efficiency:** We asked how likely it is that the improvement would have been of the same efficiency without the program.

3. **Timing:** We asked about the likely timing of the overall project (i.e., when the respondent would have made the improvements without the program).

Using these responses the *Likely Action without the Program* component part of the free-ridership score was calculated as:

$$FR\ Score_{LikelyAct} = Likelihood\ Score * Quantity\ Score * Efficiency\ Score * Timing\ Score$$

Table 26 presents how the four scores were developed.

Table 26. Scoring of Likelihood, Quantity, Efficiency, and Timing Questions

FR Component	Survey Question	Score
Likelihood	FR3. If you had not participated in the ActOnEnergy Small Business Program, how likely is it that you would have installed any new lighting equipment on your own, within the next four years? Would you say very likely, somewhat likely, not very likely, or not at all likely?	Very likely = 1.0 Somewhat likely = 0.5 Not very likely = 0.0 Not at all likely = 0.0 (Don't know) = 1.0 (Refused) = 1.0
Quantity	FR4a. If you had installed the equipment on your own, would you have installed the same quantity of lighting equipment or would you have installed less? If less: FR4b. Approximately, how much equipment would you have installed on your own? Do you think it would have been about 25% of what you installed through the Small Business Program, about 50%, about 75%, or another amount?	Same Quantity=1.0 75% of measures = 0.75 50% of measures = 0.50 25% of measures = 0.25 None = 0.0 (Don't know) = 1.0 (Refused) = 1.0
Efficiency	FR5. If you had installed the lighting equipment on your own, what is the likelihood that the equipment would have been as efficient? Please use a scale of 0 to 10, where 0 means "Not at all likely" and 10 means "Extremely Likely."	Rating / 10 *For example:* 10 – Extremely likely = 1.0 5 = 0.5 0 – Not at all likely = 0.0 (Don't know) = 1.0 (Refused) = 1.0
Timing	FR6. And if you had installed the lighting equipment on your own, when would you have installed it? Would you say…	Within 6 months = 1.0 6 months to 1 year later = 0.8 1–2 years later = 0.6 2–3 years later = 0.4 3–4 years later = 0.2 4 or more years later = 0.0 (Don't know) = 1.0 (Refused) = 1.0

As with the *Program Components* score, the *Likely Action without the Program* score values range from 0 to 1. A lower likelihood, smaller quantities, lower efficiency levels, or later implementation without the program mean a lower level of free-ridership.

Facility-Level Free-Ridership Score

The overall free-ridership score for each survey respondent was calculated as the average of the *Program Components* and *Likely Action without the Program* scores.

Decision-Making Process for Other Facilities

Respondents who had more than one facility participate in the SBDI Program were asked if their other facility(ies) went through the same or a different decision-making process compared to the facility about which the free-ridership module asked. If the respondent reports that the facility(ies) went through the same decision-making process, we applied the free-ridership score of the facility about which the free-ridership module asked.

Overall Free-Ridership Score

To estimate program free-ridership, we aggregated the facility-level free-ridership scores, weighted by each facility's gross energy savings.[15]

Participant Spillover

Participant spillover refers to energy efficiency installations that were influenced by the program but did not receive an incentive. An example of participant spillover is a respondent who completed improvements through the SBDI Program and, as a result of the positive experience, made additional energy efficiency improvements to the facility, but did not receive a discount or incentive for those additional improvements.

For the participant spillover analysis, we considered respondents who report that:

1. They installed additional energy efficient equipment following their participation in the SBDI Program; and

2. They were influenced by the SBDI Program (i.e., the respondent rated the importance of the experience with the program on the decision to make the improvements an 8 or higher on a scale of 0–10).

Respondents who meet these two criteria were first asked if they installed additional *lighting* equipment. If so, we asked about the type of lighting, and—for linear fluorescent lamps, CFLs, and LEDs only—the number and average wattage of those lamps.[16] This basic information would allow us develop a reasonable estimate of savings. Respondents were also asked if they installed any *other* equipment. If so, we asked about the type (e.g., heating, cooling, kitchen).[17] In addition, we asked why the additional equipment, lighting or other, was not installed with a discount or incentive.

To determine the program-level inside spillover rate, we divided the estimated savings of the additional equipment installed by survey respondents outside of the program (but influenced by the program) by the savings all survey respondents realized through the program.

$$Spillover\ Rate = \frac{Energy\ Savings\ (Improvements\ by\ Respondents\ outside\ Program)}{Energy\ Savings\ (Improvements\ by\ Respondents\ through\ Program)}$$

Results

Using the method outlined above, the preliminary free-ridership estimate for the SBDI Program is 0.11. Since the participant survey revealed no spillover from the program, the NTGR is equal to 1 minus the free-ridership score. As a result, the preliminary NTGR for the SBDI program is 0.89.

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[15] We weighted by ex ante, rather than ex post gross savings, since the gross impact analysis will occur later in the PY6 evaluation cycle.

[16] We asked these follow-up questions for only these three types of lighting since we expect these to be the most likely responses.

[17] For other types of equipment, we did not ask follow-up questions as it is impossible to predict which responses might be given. In addition, we do not expect that many people will have installed non-lighting equipment that was influenced by their participation in the SBDI Program, so developing a survey instrument that accounts for highly unlikely scenarios is not justified.

Table 27. PY6 NTG Results

	PY6 Results
Free-Ridership	0.11
NTGR	0.89

In general, free-ridership scores ranged from 0.00 to 0.50. As is shown in Table 28, almost half (45%) of respondents gave the program full credit for their installation of the lighting measures. These respondents would not have installed the energy efficient equipment without the program. Only 17% of respondents have a free-ridership score of greater than 0.20.

Table 28. Breakdown of Free-Ridership Results

Free-Ridership Score	Percent of Respondents
0.00	45%
> 0.00 to 0.10	18%
> 0.10 to 0.20	20%
> 0.20	17%

D. Appendix – SBDI Program Assumptions and Algorithms

D.1 Deemed Savings

The evaluation team used the following deemed numbers when calculating ex post savings. These numbers came from the evaluation plan.

Table 29. SBDI Deemed Per-Unit Savings Values

Measure Type	NTGR	Gross kWh	Net kWh	Gross kW	Net kW
CFLs	0.9	129	116	0.03	0.03
LED Exit Signs	0.9	342	308	0.04	0.04
Exit Sign LED Retrofit Kits	0.9	342	308	0.04	0.04
Occupancy Sensors	0.9	731	658	0.19	0.17
Low-Flow Aerators - Kitchen	0.9	885	797	0.22	0.20
Low-Flow Aerators (electric water heat only) - Bath	0.9	82	74	0.02	0.02
Green Nozzles (electric water heat only)	0.9	19,005	17,105	0.00	0.00

D.2 T12 to T8 Savings

The evaluation team used the TRM Version 1.0 for T12 to T8 calculations as there were no deemed numbers available. We used the following assumptions for T12 to T8 measures.

Measure Description	Watts BASE	Watts EE	Watts SAVE	Reference
T12 1-Lamp relamp/ reballast to RWT8	48	25	23	IL TRM V1 Table A-2. Pg 240. Description from application indicates baseline is T12, so assume 1-lamp F40T12 w/ EEMag Ballast.
T12 2-Lamp relamp/ reballast to RWT8	82	49	33	IL TRM V1 Table A-2. Pg 240. Description from application indicates baseline is T12, so assume 2-lamp F40T12 w/ EEMag Ballast.
T12 3-Lamp relamp/ reballast to RWT8	122	72	50	IL TRM V1 Table A-2. Pg 240. Description from application indicates baseline is T12, so assume 3-lamp F40T12 w/ EEMag Ballast.
T12 4-Lamp relamp/ reballast to RWT8	164	94	70	IL TRM V1 Table A-2. Pg 240. Description from application indicates baseline is T12, so assume 4-lamp F40T12 w/ EEMag Ballast.
T12/T8 8-foot 1-Lamp relamp/ reballast to (2) HPT8 Lamps	62	49	42	Reviewed several references for WattsBASE including: 1) NYS Ngrid Fixture Wattage Table (F96T12 Fluorescent, (1) 96', STD lamp) – ***91 watts*** 2) Ameren Act on Energy Typical Lighting Wattages (http://www.actonenergy.com/portals/0/business/forms/lighting-wattage-guide.pdf) – ***83 watts*** 3) IL TRM v1. Table A-3 page 241 – ***62 watts*** We used the TRM value as it is the most conservative and agrees with ex-ante assumptions. WattsEE taken from IL TRM V1 Table A-2. Pg 240 (2-lamp relamp/reballast with HPT8).
T12/T8 8-foot 2-Lamp Relamp/ reballast to (4) HPT8 Lamps	124	94	64	WattsBASE uses same methodology from the 1-lamp fixture and multiplies it by 2. WattsEE taken from IL TRM V1 Table A-2. Pg 240 (4-lamp relamp/reballast with HPT8).

D.3 Shower Head Savings

The evaluation team used the TRM to estimate electric savings for shower head measures and used the equations and inputs described below.

Energy Savings: *ΔkWh = %ElectricDHW * ((GPM_base * L_base - GPM_low * L_low) * NSPD * 365.25 / GPMfactor) * EPG_electric * ISR*

Demand Savings: *ΔkW = ΔkWh/ Hours * CF*

Where:

%ElectricDHW = 100% if electric water heater

GPM_base = Flow rate of the baseline shower head

GPM_low = As-used flow rate of the low-flow shower head

GPM for Water Heating Measures

Measure	GPM_base	GPM_low
Shower Head	2.67	1.75

L_base = Average baseline length shower head use per capita for all shower heads in minutes

L_base for Water Heating Measures

Measure	Minutes
Shower Head	8.20

L_low = Average retrofit length faucet use per capita for all faucets in minutes (same as L_base)

GPMfactor = Factor that normalizes flow to each shower head = 1.6

365.25 = Days per year, on average

NSPD = Estimated number of showers taken per day for one shower head

= 1

EPG_electric = Energy per gallon of hot water supplied by electric

EPG for Water Heating Measures

Measure	EPG_electric
Shower Head	0.1270

ISR = In-Service Rate

ISR for Water Heating Measures

Measure	ISR
Shower Head	98%

Hours = Annual electric DHW recovery hours for shower head use

= ((GPM_base * L_base) * NSPD * 365.25) * 0.773/GPH

= 224.7

GPH = Gallons per hour recovery of electric water heater calculated for 65.9 F temp rise (120-54.1), 98% recovery efficiency, and typical 4.5 kW electric resistance storage tank.

= 27.51

CF = Coincidence Factor for electric load reduction

= 0.0278

E. Appendix – Verification and Due Diligence

The following file contains the detailed Verification and Due Diligence memo.

AIC PY6 SBDI Verification and Due

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