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Energy Efficiency / Demand Response Plan: Plan Year 3 (6/1/2010-5/31/2011)

Evaluation Report: Public Sector Electric Efficiency Standard Incentives Program REVISED DRAFT

Presented to

The Illinois Department of Commerce and Economic Opportunity

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Presented by

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Executive Summary

Evaluation Objectives

The goal of this report is to present a summary of the findings and results from the evaluation of the Program Year 3 (PY3) Standard Incentives program.[1] The primary objectives of this evaluation are to quantify gross and net savings impacts and to determine key process-related program strengths and weaknesses and identify ways in which the program can be improved.

Under the Illinois Energy Efficiency Portfolio Standard (EEPS), the Illinois Department of Commerce and Economic Opportunity (DCEO) administers the Illinois Energy Now (IEN) Public Sector Energy Efficiency program (PSEE)[2] program that provides incentives for public sector customers of ComEd and Ameren Illinois Utilities who upgrade their facilities with energy efficient equipment. There were two specific program elements that were available to customers during the program year: a Custom Incentives program and a Standard Incentives program.

- The Standard program provides an expedited application approach for public sector customers interested in purchasing efficient technologies. The program targets discrete retrofit and replacement opportunities in lighting, LED traffic signals, HVAC, motor, and refrigeration equipment. A streamlined incentive application and quality control process is intended to facilitate ease of participation.
- Custom program incentives are available to customers for less common or more complex energy-saving measures installed in qualified retrofit and equipment replacement projects.

Some tasks within the Standard and Custom program evaluations involved close coordination between the two efforts, but the evaluations were otherwise conducted through separate approaches. The Standard and Custom programs have evaluation results reported separately.

Evaluation Methods

The key evaluation activities to assess gross and net impacts of the Standard program were:

- Reviewed tracking data and default savings assumptions used by the program.

[1] The Program Year 3 (PY3) program year began June 1, 2010 and ended May 31, 2011.

[2] The portfolio of programs has been branded as Illinois Energy Now and the former Public Service "Electric" Efficiency program was renamed to "Energy" because natural gas measures are added to the program for PY4.

- Implemented a stratified random sampling design on the population of 449 Standard project applications with three project-size strata of roughly equal ex ante energy savings allocations. Conducted a random selection of 52 projects that included all eight of the projects in the large-project stratum, 14 of 40 projects in the medium-sized project strata, and 30 of 401 of the smallest-sized projects. The sample covered 50% of PY3 Standard energy savings claimed.

- Conducted on-site visits and measurement and verification (M&V) activities on a sample of 25 Standard projects selected from the 52 projects to support gross impact evaluation. An engineering review of project files and reported energy savings was conducted on the remaining 27 projects from the sample of 52 projects. The on-site M&V was targeted to larger and more complex projects. The on-site M&V sample covered 88% of sampled energy savings, and 44% of total PY3 Standard energy savings claimed.

- Completed computer assisted telephone interviews (CATI) with 78 contacts that implemented Standard projects to support net-to-gross analysis. The Standard interviews were supplemented by an additional 14 Custom program interviews with project contacts that had combined Custom and Standard projects and reported a single decision making process was used for both measure types.

- Questions in the CATI survey were asked regarding lighting hours of use, but responses were only considered for gross impact adjustments for projects in the engineering review sample.

Four research activities were conducted in support of the process evaluation: (1) interviews with program staff, (2) a quantitative telephone survey with 77 participating customers, (3) qualitative telephone interviews with 10 participating customers focused on the procurement process, and (4) qualitative telephone interviews with five program drop-outs. These activities are further described in the main report.

The data collection and analyses for impact and process evaluation was conducted at the state-level. Energy impacts for the program are reported statewide in the main body of this report, and separately for the ComEd and Ameren Illinois Utilities in Appendix 5.2. The process results report statewide data.

Evaluation review of energy savings reported through the Smart Energy Design Assistance Program (SEDAP) are described in Appendix 5.5.

Key Findings

Standard Program Impact Results

As shown in Table 1, the PY3 Standard evaluation found that verified gross energy savings were 9 percent higher than savings in DCEO's tracking system, as indicated by the realization rate (realization rate = verified gross / tracking system gross). The PY3 realization rate of 1.09 compares with an estimated value of 1.27 in PY2. The verified net-to-gross ratio (NTGR) of 0.66 estimated for PY3 compares with a value of 0.75 estimated in PY2.

Table 1. Program-Level Evaluation-Adjusted Net kWh Impacts for PY3

Segment	Ex Ante Gross kWh	Ex Post Gross kWh	kWh RR	Ex Post Net kWh	NTGR (ex post gross)
Standard	53,634,742	58,328,889	1.09	38,236,880	0.66

Source: Analysis of tracking savings from DCEO tracking system, September 7, 2011. The values displayed for RR and NTGR are rounded.

The relative precision at a 90% confidence level for the Standard projects in the sample is ±7% for the kWh realization rate. The relative precision at a 90% confidence level for the program NTG ratio is ± 7%.

The primary factor that raised the Standard energy realization to 1.09 was a common finding, through on-site verification and telephone interviews, of longer hours of use than assumed in the default savings. Factors that lowered realization rates on individual projects were adjustments to quantities installed, and adjustments to savings based on installed and baseline equipment performance relative to default assumptions. Findings of lower hours of use than default values lowered the realization rates on some projects. A large proportion of PY3 program savings was for traffic signal projects, including 36% of overall program reported savings with the City of Chicago, and these projects were not subject to hours of use adjustments.

The primary difference in overall net-to-gross ratios between PY2 and PY3 was that larger PY3 projects had lower NTG ratios than in PY2. In PY3, some large projects had quite low NTG ratios, and a substantial fraction had results in the 0.60 to 0.65 range.

Table 2 below provides an overview of planned, reported ex ante, and evaluation-adjusted net savings impacts for the combined PY3 Standard and Custom programs.

Table 2. Comparison of Sector Electric Efficiency Program Net Savings

Net Savings Estimates	Standard MWH	Custom MWH	Combined MWH
DCEO PY3 Plan Target	128,821	20,000	148,821
DCEO Reported for PY3 (ex ante net)	42,908	21,471	64,379
Total PY3 Third-Year Evaluation-Adjusted Net Savings (ex post net)	38,237	15,477	53,714

Source: Plan target from Direct Testimony of Jonathan Feipel, DCEO, Docket No. 07-0541, Exhibit 1.2, November 15, 2007. DCEO's planned and reported net savings include a net-to-gross ratio of 0.8.

The PY3 evaluation-adjusted net savings of 38,237 MWH for Standard and 53,714 MWH for the Custom and Standard programs compares with the PY2 evaluation-adjusted net savings of 29,220 MWH for Standard and 43,191 MWH for the combined Custom and Standard programs. The PY3 ex post net savings for the Custom and Standard programs of 53,714 MWH is 0.58% of estimated 9,271,325 MWH non-low income public sector base usage.[3]

SEDAP Impact Results

In PY3, a pilot effort within the Standard program evaluation was made to quantify energy savings implemented as a result of technical services provided by the Smart Energy Design Assistance Center (SEDAC) through the Smart Energy Design Assistance Program (SEDAP). The evaluation assessment was conducted to identify savings resulting from SEDAC services that have not been claimed through incentive programs operated by DCEO, ComEd, or Ameren Illinois. Details of the data provided by SEDAC to support the claimed savings and evaluation analysis are provided in Appendix 5.5.

Based on desk-review of SEDAC tracking data, our evaluation assessment concluded SEDAP is generating energy savings that are not being claimed by other programs. The measures recommended through SEDAP include equipment retrofits and operational improvements. The measures we believe are not being claimed by other programs include equipment retrofits that are not eligible for prescriptive or custom rebates, and operational improvements. The implementation of savings is estimated by SEDAC staff from a structured protocol of regular follow-up with service recipients who identify progress on implementing audit report recommendations. The tracking records suggest that SEDAC staff is effective at steering

[3] Communication from David Baker, DCEO, December 6, 2010 indicating public sector usage of 9,271,325 MWh for non-low income public sector energy consumption.

technical service recipients to ComEd, Ameren Illinois, and DCEO programs for incentives on eligible measures.

Our evaluation review consisted of reviewing SEDAC measure-level tracking data for each of the 39 projects with PY3 service recipients who reported completing or starting measure implementation. Where recipients had reported completing the measure implementation process, we could identify measures assignable as unclaimed SEDAP savings from measures that had been submitted for EEPs incentives. Only a small portion of savings potentially assignable to SEDAP fell into this category. The bulk of potential SEDAP claimable savings implemented by service recipients could not be separated and verified at the measure level from savings potentially claimed by an EEPs incentive program because action on recommendations were partially implemented and still ongoing. Verification would require project documentation review and site-specific data collection by the evaluation team once the SEDAP participant had concluded work on the audit recommendations. Table 3 provides a summary of our assessment of SEDAC tracking data.

The 146,813 kWh of desk review verified savings from SEDAP in PY3 shown in Table 3 consists only of savings resulting from technical services provided during PY3. A second block of PY3 implemented energy savings totaling 1,375,147 kWh was identified by SEDAC as measures that had participated in an EEP's incentive program. The third and largest category PY3 implemented energy savings totaling 2,692,674 kWh involved projects where the contact had indicated implementation was in-progress. Although some measures had been implemented, we could not verify from the data how much of the savings to assign to SEDAP versus measures that could be counted toward EEPs. On some projects, additional detail from SEDAC to provide implemented savings on a measure level would allow us to categorize measures as either SEDAP claimable or EEPs even if work was still ongoing at the facility. In other cases, we would need to wait until EEPs eligible work at the facility had been completed in order to make a determination due to the complexity of the project and potential for measure interactions.

Our review of SEDAP tracking data indicated that approximately 21,502 MWh of energy savings measures from SEDAP services provided during PY1 and PY2 were reported implemented by the end of PY3. It was not possible to quantify SEDAP claimable savings for PY3 from services provided in PY1 and PY2 from the data. It may be possible to quantify implemented savings from prior year's technical services through site-specific data collection.

Table 3. Verified and Potential Energy Savings Claimable through SEDAP Services

Evaluation Assessment Category	Project Count	Implemented Savings, kWh			Measure not yet implemented, assignment to EEPs or SEDAP to be determined, kWh
		EEPs, "desk verified"	SEDAP, "desk verified"	EEPs or SEDAP, to be verified	
PY3 Implementation completed, EEPs savings claimed	7	1,375,147		-	-
PY3 Implementation completed on measures claimable by SEDAP, with some measures not yet implemented	10	-	146,813	-	905,554
PY3 Implementation completed on measures claimable by EEPs, with some measures not yet implemented	3	113,852	-	-	1,001,609
PY3 Implementation in-progress	19	444,448	-	2,692,674	4,918,409
SEDAP PY3 services provided, implementation not begun	140				30,178,640
Subtotal, All SEDAP PY3 services	**179**	**1,933,447**	**146,813**	**2,692,674**	**37,004,212**
Subtotal, All SEDAP PY1 and PY2 services	**342**			**21,502,357**	**82,698,391**
Total, All SEDAP services, PY1 through PY3	**521**	**1,933,447**	**146,813**	**24,195,031**	**119,702,603**

Source: Evaluation analysis of tracking data provided by SEDACBased on our desk review of SEDAC tracking data, measure savings claimable for SEDAP are similar to those implemented through the retrocommissioning program offered by DCEO. To estimate the size of potential net savings from SEDAC services, we recommend the gross energy realization rate (0.795) and net-to-gross ratio (0.98) from the PY3 Retrocommissioning evaluation be applied to evaluation verified savings. Applying these ratios to the 146,813 kWh of evaluation verified gross ex ante

savings for SEDAP yields 114,382 kWh of verified net savings that could be claimed for SEDAP in PY3. With additional measure-level savings data from SEDAC and site verification by evaluators on a sample of the 2,692,674 kWh recommended and implemented in PY3 plus PY3 implementation from prior years' services, the evaluation verified savings for SEDAP in PY3 could be much higher.

Key Impact Findings and Recommendations

Specific recommendations to consider include:

- **During PY4, DCEO should consider working with the evaluation team to ensure that statewide technical reference manual development provides additional building types or modifications to existing building types that would be beneficial for reporting energy savings.** Although the current set of building types work reasonably well, they were developed by ComEd for commercial businesses and not specifically designed for public building types. After three years of Standard program operation and evaluation cycles, plus work conducted by SEDAC, a substantial set of site collected data is available. The evaluation team has compiled observations from field verification and telephone survey work and can provide additional analysis.

- **During PY4, prior to closing out year-end ex ante savings estimates, DCEO should consider working with the evaluation team to review default values and ex ante savings calculation outputs to ensure that tracking system output matches values expected by the evaluators.** The evaluation team can review default lookup values coded into the tracking system and check the values against the default values documentation, and advise DCEO on any differences. The evaluation team could also review the output of ex ante calculations as ongoing changes are made in the tracking system.

- **DCEO should consider working with the evaluation team to facilitate evaluation analysis and reporting of measure-level impact results.** The tracking system stores project data at the measure level, however, the evaluation team was not able to produce measure level impacts from tracking data extracts provided by DCEO for the PY3 evaluation. If the evaluation team could extract measure-level savings information it would facilitate savings verification analysis and allow the evaluation team to provide greater detail to reporting.

- **DCEO should consider additional quality assurance and quality control steps to verify the unit basis and quantities entered into the tracking system.** As a general qualitative finding, DCEO was quite accurate on measure quantities claimed, with a common finding being exact or within one or two percent on sampled projects. This is commendable given that some Standard projects have quantity counts that number in the hundreds and thousands. There were instances where projects had recorded the

wrong units when recording savings, either recording lamps when the correct unit was an entire fixture, or recording a fixture count when the unit required was lamps. The new tracking system may allow for enhanced checking or alerts regarding individual measure entries.

- **DCEO should consider additional quality assurance and quality control steps to verify the eligibility requirements on measure types with complex requirements.** As a general qualitative finding, equipment was eligible for the measure assigned. Within our sample, there was an instance of a high performance T8 lamp and ballast installation not meeting the baseline and ballast requirements, and a project with HVAC measures that did not qualify. The new tracking system may allow for enhanced checking, flags, or alerts regarding individual measure entries.

- **DCEO should consider strategies to increase participation of smaller projects.** Projects in the small-size stratum, with savings under 200,000 kWh, had higher gross realization rates and net-to-gross ratios than larger projects, on average.

- **DCEO should continue strategies to increase participation of fluorescent lighting projects tied to pending Federal fluorescent lighting standards.** Open-ended interview responses indicated a concern for the future availability of T12 and standard T8 lamps and this was a motivating factor in some projects. This is an important topic to address in ongoing marketing and outreach efforts.

Key Process Finding and Recommendations

Participants are very satisfied with the Standard Program: More than 90% of participants are satisfied with DCEO overall, the program overall, staff communications, and the incentive level. Satisfaction with the incentive amount is higher in PY3 compared to PY1, reflecting the increasing incentive levels since program inception. Specific recommendations to consider include:

Program Participation

- **DCEO should consider special offerings for sectors with limited participation but high savings potential.** Hard-to-engage sectors with high savings potential might benefit from specific offerings to encourage more participation. This could include limited-time offerings or a bonus incentive for projects exceeding a certain size. The increase in incentive levels for non-carve out entities[4] (universities and State and Federal governments) in PY4 should help in increasing participation among these sectors.

- **DCEO should continue the development of database functionalities to make it a more useful program management and evaluation tool.** While the database has allowed staff to be more efficient in a number of ways, it is not yet developed and used to its fullest potential as a management tool. The program should continue to make database improvements and provide ongoing user training to program staff and any partners who might use it in the future. DCEO has noted that they have recently provided training to SEDAC, the Energy Resources Center and several other partners on use of the DCEO database. Partners that administer programs on their behalf or conduct site visits are using the DCEO database in PY4.

Program Partnerships

- DCEO should be aware that participation by projects that also receive significant funding from other public sources has the potential to result in higher free-ridership in the DCEO program. Although the savings weighted-average free-ridership on co-funded projects in PY3 was not higher than the mean value for the overall program, co-funding has the potential to increase DCEO free-ridership scores if participants assign relatively more influence to the other co-funding sources.

Trade Allies

- **Development of a program-specific trade ally network is well-warranted, and DCEO should consider recruiting trade allies capable of helping at the project design stage, so that the trade allies have an opportunity to promote energy efficiency and participation in the PSEE program to public sector entities.** Based on our procurement process interviews, trade allies are often involved at the project specifications stage and then again at the implementation stage. While trade allies have influence over the energy efficiency of equipment at the former stage, they rarely do at the latter stage since project details have already been determined. In future promotions the program should continue to leverage trade ally involvement as a key channel to inform participants.

[4] A "carve out" group was developed by DCEO in PY3. This group (local governments, K-12 schools, and community colleges) received higher incentive levels than federal and state governments, and universities.

DCEO reports that activity on this recommendation is underway, with the Energy Resources Center and SEDAC developing a trade ally program for DCEO.

- **Consider providing additional resources to help potential applicants connect with technical expertise.** While SEDAC already provides technical assistance, a program-specific trade ally network could help connect applicants with qualified technical support. Outreach materials should emphasize these resources.

Marketing and Outreach

- **The program should consider developing short sector-specific case studies or fact sheets that provide examples of potential savings. This might be a useful tool for facility managers when seeking approval for energy efficiency upgrades.** While the increased PY4 incentive level will help reduce financial barriers for non-carve out sectors, the upfront cost of energy efficient equipment is likely to remain a barrier to participation for many public sector entities. However, this barrier might be reduced if prospective participants had more collateral that demonstrates the savings that can be expected from the installation of energy efficient equipment.

Program Drop-outs

- **DCEO should continue making regular requests of periodic status updates from applicants.** Requesting status updates throughout the year will allow program staff to remain connected with applicants and potentially help them by suggesting resources or clarifying points of confusion. DCEO reports that using the email addresses in the database, they did two mass mailings in 2011, in February and April, to all grantees that had not completed their projects to determine their status and remind them of deadlines.

- **DCEO should consider enacting a follow up process with program drop-outs in the future if the number drop outs increases.** At this time, there are very few drop-outs that do not re-apply the following year. If drop-outs increase, following up with these applicants and informing them about PSEE opportunities might result in additional project applications.

Section 1. Introduction to the Program

This evaluation report covers the Standard Incentives program element of the PY3 Public Sector Electric Efficiency incentive program.[5]

1.1 Program Description

In PY3, the Illinois Department of Commerce and Economic Opportunity (DCEO) Public Sector Electric Efficiency program provided incentives for public sector customers of ComEd and Ameren Illinois Utilities who upgrade their facilities with energy efficient electric equipment. There were two specific program elements that were available to customers during the program year: a Custom Incentives program and a Standard Incentives program.

- The Standard Incentives program provides an expedited application approach for public sector entities interested in purchasing efficient technologies. The program targets discrete retrofit and replacement opportunities in lighting, HVAC, motor, and refrigeration equipment. A streamlined incentive application and quality control process is intended to facilitate ease of participation. The measure list matched ComEd, except that DCEO offered incentives for LED traffic signals.
- Custom program incentives are available to customers for less common or more complex energy-saving measures installed in qualified retrofit and equipment replacement projects.

DCEO uses internal staff to manage, implement, and administer the program. Technical assistance is provided as needed with the assistance of the Smart Energy Design Assistance Center (SEDAC). A detailed discussion of the program design and operation is provided in the process evaluation findings of Section 3.2.

The net MWh savings goals and budgets for the Standard Incentives program, as included in the Three-Year Plan approved by the Illinois Commerce Commission, are presented in Table 1-1 for PY3.

[5] The portfolio of programs has been branded as Illinois Energy Now and the former Public Service "Electric" Efficiency program was renamed to "Energy" for PY4 because natural gas measures are added to the program.

Table 1-1. Public Sector Electric Efficiency Standard PY3 Planned Savings Goals and Budgets

Utility	Plan Target Net MWh	Plan Target Net MW	Plan Target Total Cost
ComEd	94,954	27.1	$14,679 million
Ameren	33,867	9.7	$5,194 million
Total	128,821	36.7	$19,873 million

Source: Direct Testimony of Jonathan Feipel, DCEO, Docket No. 07-0541, Exhibit 1.2, November 15, 2007.

DCEO operates the PSEE program with a joint goal for energy savings that combines Standard and Custom program results, not as separate goals for each program. The combined Standard and Custom goal for PSEE net energy savings is 148,821 MWh, which includes 20,000 MWh for Custom.

1.2 Evaluation Questions

The evaluation sought to answer the following key researchable questions.

The impact evaluation questions focused on the following key areas:

1. What are the gross impacts from this program?
2. What are the net impacts from this program?
3. Did the program meet its energy goals? If not, why not?
4. What is the program's benefit-cost ratio using the Illinois TRC test?

The process evaluation questions focused on the following topics:

1. Program participation
2. Program design and implementation
3. Program partnerships
4. Trade allies
5. Marketing and outreach
6. Barriers to participation
7. Program drop-outs
8. Public sector procurement process
9. Participant satisfaction

The full list of researchable questions can be found in the Evaluation Plan.

Section 2. Evaluation Methods

The key evaluation activities to assess gross and net impacts of the Standard program were:

- Reviewed tracking data and default savings assumptions used by the program.
- Implemented a stratified random sampling design on the population of 449 Standard project applications with three project size strata of roughly equal ex ante energy savings allocation. Conducted a random selection of 52 projects that included all eight of the projects in the large-project stratum, 14 of 40 projects in the medium-sized project strata, and 30 of 401 of the smallest-sized projects. The sample covered 50% of PY3 Standard energy savings claimed.
- Conducted on-site visits and measurement and verification (M&V) activities on a sample of 25 Standard projects selected from the 52 projects to support gross impact evaluation. An engineering review of project files and reported energy savings was conducted on the remaining 27 projects from the sample of 52 projects. The on-site M&V was targeted to larger and more complex projects. The on-site M&V sample covered 88% of sampled energy savings, and 44% of total PY3 Standard energy savings claimed.
- Completed computer assisted telephone interviews (CATI) with 78 contacts that implemented Standard projects to support net-to-gross analysis. The Standard interviews were supplemented by an additional 14 Custom program interviews with project contacts that had combined Custom and Standard projects and reported a single decision making process was used for both measure types.
- Questions in the CATI survey were asked regarding lighting hours of use, but responses were only considered for gross impact adjustments for projects in the engineering review sample.

Four research activities were conducted in support of the process evaluation: (1) interviews with program staff, (2) a quantitative telephone survey with 77 participating customers, (3) qualitative telephone interviews with 10 participating customers focused on the procurement process, and (4) qualitative telephone interviews with five program drop-outs. These activities are further described in Section 3.2.

The data collection and analyses for impact and process evaluation was conducted at the state-level. Energy impacts for the program are reported statewide in the main body of this report, and separately for the ComEd and Ameren Illinois Utilities in Appendix 5.2. The process results report statewide data.

The sections that follow provide a summary of the analytical methods deployed, while full details may be found in Appendix 5.3.

2.1 Analytical Methods

2.1.1 Impact Evaluation Methods

Gross Program Savings

The objective of this element of the impact evaluation is to verify the accuracy of the PY3 ex ante gross savings estimates in the Standard program tracking system. The savings reported in DCEO's tracking system were evaluated using the following steps:

1. Engineering review at the measure-level for a sample of 52 project files, with the following subcomponents:
    a. Engineering review and analysis of measure savings based on project documentation, default assumptions, and tracking data.
    b. Review and application (if appropriate) of participant telephone survey impact data (reported hours of use) to projects in the engineering review sample.
    c. On-site verification audits at 25 project sites selected from the sample of 52 projects. Performance measurements included spot measurements and run-time hour data logging for selected measures. On-site data collection was conducted in the July through September period.
    d. Calculation of a verified gross savings value (kWh) for each project within the sample, based on measure-level engineering analysis.
2. Carry out a quality control review of the ex post impact estimates and the associated draft site reports and implement any necessary revisions.

A verified gross realization rate (which is the ratio of the ex post gross savings-to-reported tracking savings) was then estimated for the sample, by sampling stratum, and applied to the population of reported tracking savings, using sampling-based approaches that are described in greater detail in Sections 2 and 3 below. The result is an ex post estimate of gross savings for the Standard program.

Net Program Savings

After gross program impacts have been assessed, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio that quantifies the percentage of the gross program impacts that can be reliably attributed to the program.

For PY3, the net program impacts were quantified from the estimated level of free-ridership. Quantifying free-ridership requires estimating what would have happened in the absence of the program. A customer self-report method, based on data gathered during participant telephone

interviews, was used to estimate the free-ridership for this evaluation. The existence of participant spillover was qualitatively examined by identifying spillover candidates through questions asked in the participant interviews. If response data provides sufficient detail to quantify participant spillover, those impacts are estimated.

Once free-ridership and participant spillover has been estimated the Net-to-Gross (NTG) ratio is calculated as follows:

NTG Ratio = 1 – Free-ridership Rate + Participant Spillover

Free ridership was assessed following a framework that was developed for evaluating net savings of California's 2006-2008 nonresidential energy efficiency programs. This method calculates free-ridership using data collected during participant telephone interviews concerning the following three items:

- A **Timing and Selection** score that reflected the influence of the most important of various program and program-related elements in the customer's decision to select the specific program measure at this time.

- A **Program Influence** score that captured the perceived importance of the program (whether rebate, recommendation, or other program intervention) relative to non-program factors in the decision to implement the specific measure that was eventually adopted or installed. This score is cut in half if they learned about the program after they decided to implement the measures *and* funds were committed before learning about the program (if funds were not committed, the program received full credit).

- A **No-Program** score that captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available. This score accounts for deferred free ridership by incorporating the likelihood that the customer would have installed program-qualifying measures at a later date if the program had not been available.

Interviews with Standard project contacts were supplemented by interviews with project contacts that had combined Custom and Standard projects and reported a single decision making process. For projects that receive greater program funding levels, an effort is made during the customer telephone interview to more completely examine project influence sources in order to allow for any adjustments to the customer self-reported score.

The net-to-gross scoring approach is summarized in Table 2-1.

Table 2-1. Net-to-Gross Scoring Algorithm for the PY3 Standard Program

Scoring Element	Calculation
Timing and Selection score. The maximum score (on a scale of 0 to 10 where 0 equals not at all influential and 10 equals very influential) among the self-reported influence level the program had for: A. Availability of the program incentive B. Recommendation from a DCEO staff person C. Information from program marketing materials D. Endorsement or recommendation by a utility account manager E. Other factors (recorded verbatim) F. Information provided through technical assistance received from DCEO or SEDAC staff G. Vendor Score (if triggered) Potential adjustments for non-program influences	Basic Rigor: Maximum of A, B, C, D, and E Standard Rigor: Maximum of A, B, C, D, E, F, and G, with potential adjustments for non-program influences
Program Influence score. "If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <ENDUSE>, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?"	Points awarded to the program (divided by 10) Divide by 2 if the customer learned about the program AFTER deciding to implement the measure that was installed *and* funds were committed before learning about the program
No-Program score. "Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely," if the sponsor program had not been available, what is the likelihood that you would have installed exactly the same equipment?" The NTG algorithm computes the Likelihood Score as 10 minus the respondent's answer (e.g., the likelihood score will be 0 if extremely likely to install exactly the same equipment if the program had not been available). Adjustments to the "Likelihood score" are made for timing: "Without the program, when do you think you would have installed this equipment?" Free-ridership diminishes as the timing of the installation without the program moves further into the future.	Interpolate between Likelihood Score and 10 to obtain the No-Program score, where If "At the same time" or within 6 months then the No Program score equals the Likelihood Score, and if 48 months later then the No Program Score equals 10 (no free-ridership)
Project-level Free-ridership (ranges from 0.00 to 1.00)	1 – Sum of scores (Timing & Selection, Program Influence, No-Program)/30
Apply score to other end-uses within the same project?	If yes, assign free-ridership score to other end-uses of same project
Apply score to other projects of the same end-use?	If yes, assign score to same end-use of additional projects
PY3 Project level Net-to-Gross Ratio (ranges from 0.00 to 1.00)	1 – Project level Free-ridership

2.1.2 Process Evaluation Methods

Four research activities were conducted in support of the process evaluation: (1) interviews with program staff, (2) a quantitative telephone survey with 77 participating customers, (3) qualitative telephone interviews with 10 participating customers focused on the procurement process, and (4) qualitative telephone interviews with five program drop-outs. These activities are further described in the section below.

2.2 *Data Sources*

Table 2-2 provides a summary of the principal data sources contributing to the evaluation of the PY3 Standard program. For each data element listed, the table provides the targeted population, the sample frame and design, the sample size, and the timing of data collection.

The interview guides and data collection instruments for telephone surveys are included in Appendix 5.1.

Table 2-2. Principal Data Sources Contributing to the PY3 Evaluation

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
In-depth Telephone Interviews	DCEO Management and Standard Program Staff	Contact from DCEO	Standard Incentives Program Manager Manager of Marketing and Outreach, and DCEO Management	3	August 2011
CATI Telephone Survey	Standard Program Participants	Tracking Database	Stratified Random Sample of DCEO Standard Program Participants	77 (Process) 78 (Net-to-Gross)	September 2011
Procurement Process Interviews	Standard Program Participants	Tracking Database	Contacts provided through Participant Survey	10	September/ October 2011
Program Drop-out Interviews	Standard Program Participant Drop-outs	Tracking Database	Census Attempt	5	September/ October 2011
Engineering File Review	Projects in the Standard Program	Tracking Database, July 13, 2011 Extract	Stratified Random Sample of 52 by Standard Project-Level kWh (3 Strata) Assigned to On-Site or File Review	27	July 2011-September 2011
On-Site Visit M&V				25	

2.2.1 Tracking Data

The tracking data for this evaluation was extracted from a copy of the DCEO database provided to the evaluation team on a periodic basis. The final ex ante tracking data used to provide program reported energy savings for this evaluation was dated September 7, 2011.

Sampling was conducted from DCEO extracts produced in July 2011. For gross impact evaluation, the sample was drawn from the population of projects identified as the PY3 participants in a July 13, 2011 extract. The Standard telephone survey sample was drawn from a database extract dated July 28, 2011.

Midway through PY3, DCEO implemented a transition from the spreadsheet-based tracking approach used throughout PY1 and PY2 and most of PY3 to a new centralized database tracking system. The transition for program staff occurred later in PY3, and the new system was undergoing programming refinements throughout the summer of 2011 at the time when evaluation sample design was taking place. The September 7, 2011 extract data changed the ex ante energy savings for approximately one-third of the Standard program population compared with July 13th and July 28th 2011 extracts, with some projects changing significantly. DCEO reports that the tracking system was correctly calculating savings during this period, but that they were not correctly converted into the evaluation extract drawn from the tracking system. Although DCEO's September 7, 2011 reported savings were used in the final impact analysis, sample design was based on the July extracts. As a result, sample points selected for impact verification do match the intended allocations by strata, however, the sample selected was large enough so that precision targets were met.

2.2.2 Program Staff Interviews

The evaluation team conducted one interview with the Standard Program manager. The interview focused on the changes to program design and implementation compared to PY2 and the effects of those changes on program administration and participation. In addition, two telephone interviews were conducted with DCEO Management staff. One interview explored the Standard Program's marketing and outreach activities in PY3; the second focused on several high level PY3 program design, process, and implementation changes.

2.2.3 CATI Telephone Survey

A Computer-Assisted Telephone Interviewing (CATI) survey was conducted with a stratified random sample of 77 participants.[6] This survey focused on three key areas:

- **Net program impacts**. The survey collected data for a quantitative assessment of free-ridership and a qualitative assessment of spillover.
- **Gross program impacts.** The survey collected data on hours-of-use for lighting measures.
- **Process evaluation.** The survey collected data on participant perceptions of program processes and implementation, satisfaction, barriers to participation, and business demographics.

The survey was directed toward unique customer contact names drawn from the PY3 tracking database. All surveys were completed by Opinion Dynamics Corporation's call center in September 2011.

2.2.4 Procurement Process Interviews

Telephone interviews were conducted with 10 participants in the Standard and Custom programs regarding their equipment procurement approval processes. These processes can be a key barrier to participation for many public sector entities. The evaluation targeted individuals identified during the participant survey process as those in charge of procurement at their organization.

2.2.5 Program Drop-out Interviews

The evaluation team conducted five interviews with contacts that had filed a pre-approval application for either a Standard or Custom project in PY3 but ultimately did not file a final application. The purpose of these interviews was to understand barriers to program

[6] One respondent terminated the interview after completing the net-to-gross module; as such, 78 completed interviews were available for the net-to-gross analysis.

participation and the reasons for not moving forward with the planned projects. The sample frame for this effort included 50 contacts for 53 projects for which pre-approval applications had been filed. These projects were flagged as "Canceled." Excluded from the sample frame were projects where the tracking database indicated that the project was likely to be completed in PY4.

We interviewed 21 of the 50 contacts, but 16 respondents indicated that the project had already been submitted for PY4 or would be submitted in the near future.

2.2.6 Project Application File Review

To support final application file review, project documentation in hard copy format was scanned into electronic files for each sampled project. Documentation included some or all of hardcopy application forms and supporting documentation from the applicant (ex ante impact calculations, invoices, measure specification sheets, vendor proposals), pre-inspection reports (when conducted), post inspection reports (when conducted), and important email and memoranda.

2.2.7 On-Site Visits and Measurement

On-site surveys were completed for 25 of the applications sampled for M&V. During each on-site visit, data identified in the analysis plan is collected, including monitoring records (such as instantaneous spot watt measurements for relevant equipment, measured temperatures, data from equipment logs and EMS/SCADA system downloads), equipment nameplate data, system operation sequences and operating schedules, and a careful description of site conditions that might contribute to baseline selection.

2.3 Sampling

Sampling was conducted from extracts produced in July 2011. For gross impact evaluation, the sample was drawn from the population of projects identified as the PY3 participants in a July 13, 2011 extract. The Standard telephone survey sample was drawn from a database extract dated July 28, 2011.

Details of the sampling approach are provided in Appendix 5.3.

2.3.1 Gross Impact M&V Sample

For the PY3 program year, a statistically significant sample based on a 90/10 confidence/precision level for program-level savings was drawn for the gross savings verification.

Table 2-3 provides a profile of the gross impact verification sample for the Standard program in comparison with the Standard program population. Shown is the resulting sample that was

drawn, consisting of 52 projects, responsible for 26.6 million kWh of ex ante impact claim and representing 50% of the ex ante impact claim for the program population. Also shown are the ex-ante based kWh sample weights for each of three strata.

Table 2-3. Profile of the Gross Impact Sample by Strata

Standard Population Summary				Impact Sample		
Sampling Strata	Number of Project Applications (N)	Ex Ante kWh Impact Claimed	kWh Weights	n	Ex Ante kWh	Sampled % of Population
1	8	20,890,748	0.390	8	20,890,748	100%
2	40	13,741,669	0.256	14	4,175,611	30%
3	401	19,002,325	0.354	30	1,528,882	8%
TOTAL	**449**	**53,634,742**	**1.000**	**52**	**26,595,241**	**50%**

Source: Evaluation analysis of tracking savings from DCEO tracking system, September 7, 2011.

Table 2-4 provides a comparison of the population profile to the sample analyzed by utility, and shows that the sample reflects the same proportions by utility as the population.

Table 2-4. Profile of the Gross Impact Sample by Utility

Standard Population Summary				Impact Sample		
Utility	Number of Project Applications (N)	Ex Ante kWh Impact Claimed	kWh Weights	n	Ex Ante kWh	kWh Weights
Ameren	158	12,932,568	0.24	18	6,487,723	0.24
ComEd	291	40,702,174	0.76	34	20,107,518	0.76
TOTAL	**449**	**53,634,742**	**1.00**	**52**	**26,595,241**	**1.00**

Source: Evaluation analysis of tracking savings from DCEO tracking system, September 7, 2011.

Table 2-5 provides a comparison of the population profile to the sample analyzed by public sector customer type. The sample reflects the dominance of local government projects, which includes a large representation by LED traffic signal projects. In PY3, the City of Chicago had 25 traffic lighting project applications that totaled 19,307,723 kWh of ex ante energy savings, and many other municipalities statewide took advantage of the DCEO Standard program to improve the efficiency of their traffic lighting. Although K-12 Schools are somewhat underrepresented in the sample compared with the percentage of energy savings in the population, the sample was able to cover 22 percent of K-12 school savings statewide.

Table 2-5. PY3 Standard Sample Public Sector Type Comparison

Public Sector Type	Ex-Ante Claimed Savings			
	Gross kWh, Population		Gross kWh, Sample	
College	776,496	1%	308,880	1%
Federal Government	3,231,251	6%	2,174,610	8%
K-12 Schools	10,025,921	19%	2,192,672	8%
Local Government	33,306,792	62%	16,682,655	63%
State Government	631,347	1%	-	0%
University	5,662,935	11%	5,236,424	20%
Total	**53,634,742**	**100%**	**26,595,241**	**100%**

Source: Evaluation analysis of tracking savings from DCEO tracking system, September 7, 2011.

Table 2-6 provides a breakdown of sample by verification approach. A very large portion of the sample, 88 percent, was verified through on-site M&V audits, covering 44 percent of all PY3 Standard program energy savings. This was possible because of the concentration of program savings in larger projects. It should be noted that for the large traffic lighting projects, the site verification strategy involved sampling of installed measures within individual projects, not a census count of installed traffic signals.

Table 2-6. PY3 Standard Sample by Verification Approach

Verification Approach	Ex-Ante Claimed Savings	
	Gross kWh, Sample	
Engineering File Review	3,082,331	12%
On-Site M&V	23,512,910	88%
Total	26,595,241	100%

Source: Evaluation analysis of tracking savings from DCEO tracking system, September 7, 2011.

2.3.2 CATI Telephone Survey for Participating Customers

To best support estimation of the net-to-gross ratio for the program, a stratified random sampling approach was employed for this survey. Projects were stratified by savings, using the ex ante kWh impacts reported in the tracking database. Records were sorted from largest to smallest kWh claimed and placed into one of three strata, such that approximately one-third of ex ante savings fell into each stratum.[7] The CATI sample used the same stratum boundaries as the gross impact M&V sample described in the previous section.

[7] Stratum 1: large savers (>843,000 kWh); Stratum 2: medium savers (between 843,000 and 199,000 kWh); Stratum 3: small savers (<=199,000 kWh). Strata were developed using a database abstract from July 28, 2011. After surveys were fielded based on these strata assignments, the evaluation team received an updated extract of program savings.

The sampling unit for the CATI telephone survey was the unique project contact. The sample frame included 280 unique contacts that had completed 354 projects. Projects associated with duplicate contact names were removed from the sample (in cases where a single person was involved in more than one project application). Projects with larger savings were retained in the sample. Projects with non-lighting end uses were also given preference. With the exception of three contacts who had completed very large Standard projects, participants who completed both Standard and Custom projects were also removed from the sample for the Standard survey (given the smaller population of Custom projects, the Custom Program was given priority for calling overlapping project contacts).

Of the 280 unique contacts in the Standard sample frame, 77 completed the survey. In addition, one respondent did not complete the entire survey but responded to all net-to-gross questions. The Standard net-to-gross interview results were supplemented by the results of 14 Custom program interviews with project contacts that had combined Custom and Standard projects and reported a single decision making process was used for both measure types. Interviewees were reminded of additional applications they had submitted for projects of the same end-use, and then asked whether the additional applications had the same decision making process. When the respondent indicated a single decision covered all projects, the net-to-gross score was applied to the other project applications of the same end use. Through this question, an additional 36 projects were included within the Standard net-to-gross scoring. This resulted in a sample of 128 project applications with a precision level of +/-7% for net-to-gross questions, and a precision level of +/-8% for process questions (at a 90% confidence level) for the 77 completed process interviews.[8]

Table 2-7 provides a summary of the sampling approach used for the net impact analysis, by stratum, and the resulting kWh weights. The table shows that the 78 completed Standard net-to-gross interviews plus the additional 14 interviews completed for the Custom and Standard projects, plus the additional 36 multiple-application scores represent 61% of reported ex ante program savings.

While strata boundaries remained the same, 14 Stratum 2 projects moved to stratum 3. Two completed interviews fell into this group.

[8] The difference in precision between net-to-gross questions and process questions is the result of net-to-gross findings being based on savings for all project applications and process findings being based on unique respondents.

Table 2-7. Summary of Sampling Approach for the Participant Survey

Sampling Strata	Final Population			Completed Interviews		
	Number of Applications (N)	Ex Ante kWh Impact Claimed	kWh Weights by Segment	Number of Respondent Applications (n)*	Ex Ante kWh Claimed	% of Population Impacts Surveyed
1	8	20,890,748	0.390	5	18,163,870	87%
2	40	13,741,669	0.256	26	9,297,068	68%
3	401	19,002,325	0.354	97	4,998,750	26%
TOTAL	**449**	**53,634,742**	**1.000**	**128**	**32,459,688**	**61%**

**Includes one mid-interview terminate who only completed the net-to-gross questions.*
Source: Program tracking database; results of CATI telephone survey.

Survey Disposition

Table 2-8 below shows the final disposition of the 280 unique contacts included in the sample frame for the participant survey. Contact with over three quarters of the sample (79%) was attempted at least once, resulting in 77 completed interviews. The survey center was unable to make contact with 13% of contacts for a variety of reasons including: no one answered the telephone, an answering machine picked up, or the telephone line was busy. On average, we attempted to reach each of these customers five times. The telephone numbers provided for 5% of the sample had problems such as being disconnected or an incorrect number.

Overall the response rate for this survey was 38% computed as the number of completed interviews divided by the number of eligible respondents.[9]

[9] Eligible respondents include the following dispositions: a) Completed Surveys, b) Unable to Reach, c) Callback, and d) Refusal/Mid-Interview Termination.

Table 2-8. Sample Disposition

Sample Disposition	Customers	%
Sample Frame of Unique Contacts	280	
Completed Survey	77	28%
Not Dialed	60	21%
Unable to reach	35	13%
Callback	48	17%
Refusal/Mid Interview Termination	45	16%
Phone Number Issue	13	5%
Could not confirm participation	2	1%
Response Rate	*38%*	

Source: ODC CATI Center

Profile of Survey Respondents

The evaluation team compared attributes of those who completed the CATI survey to the full population of unique contacts who completed projects in PY3. This comparison provides an indication of how representative the 77 completed interviews are of the final population.

Table 2-9 shows the distribution of project size among the population and among contacts who completed the survey. Even though the stratified sampling approach over-emphasized larger projects, the distribution of survey respondents by project size is almost identical to that of the population. We therefore determined that the analysis of process results does not require sample weights.

Table 2-9. Comparison of Completed Interviews and Population by Project Size

Project Size	Population*		Completed Survey	
	#	%	#	%
Large Projects	6	2%	2	3%
Medium Projects	21	6%	6	8%
Small Projects	308	92%	69	90%
TOTAL	**335**		**77**	

**Note: The population represents the number of unique contacts who completed projects that could be used for survey fielding purposes (including those that were removed due to overlap with the Custom Program).*
Source: Program tracking database; results of CATI telephone survey.

Table 2-10 compares the sector category of those who completed the survey to the population of unique contacts who completed projects in PY3. This comparison shows that the distribution by

sector of the population and the sample are quite similar: local government represents the majority; K-12 schools represent about a third; and all other sectors represent less than 10% combined.

Table 2-10. Comparison of Completed Interviews and Population by Sector

Sector	Population*		Completed Survey	
	#	%	#	%
Local Government	195	58%	48	62%
K-12 Schools	115	34%	23	30%
Federal Government	6	2%	2	3%
College	8	2%	2	3%
University	5	1%	1	1%
State Government	6	2%	1	1%
TOTAL	**335**		**77**	

**Note: The population represents the number of unique contacts who completed projects that could be used for survey fielding purposes (including those that were removed due to overlap with the Custom Program).*
Source: Program tracking database; results of CATI telephone survey.

Based on these comparisons, we conclude that survey responses to the process questions are reasonably representative of the PY3 population.

Section 3. Program Level Results

This section presents the Standard program impact and process evaluation results.

3.1 Impact Analysis

3.1.1 Tracking System and Default Savings Review

Tracking System Review

Midway through PY3, DCEO implemented a transition from the spreadsheet-based tracking approach used throughout PY1 and PY2 and most of PY3 to a new centralized relational database tracking system. The transition for program staff occurred later in PY3, and the new system was undergoing programming refinements throughout the summer of 2011 at the time when evaluation sample design was taking place. The evaluation team works off of extracts generated from the tracking system data provided by DCEO on a periodic basis. Evaluation sample design was completed using an extract from July 13, 2011, and final reported savings for PY3 were provided by a September 7, 2011 extract.

The new tracking system provides the calculation engine that produces program reported savings. The tracking system includes lookup tables that draw in default savings assumptions and user provided input data for measure type, quantity, size, and building type. Although measure description information was populated in the tracking system, applications involving more than one measure record savings as a single value. If the tracking system stored measure-level savings information it would facilitate savings verification analysis and allow the evaluation team to provide greater detail to reporting.

The new tracking system provides expanded contact information for program applicants and program allies, and this greatly facilitated our development of the telephone survey sample data. It was evident from the data that additional work is needed to clean data pulled in from the old system, and to incorporate new data from hard copies, such as contractor information, that was partially filled in at the time we drew our sample.

In comparison with PY1 and PY2, the PY3 data was much clearer and stable with regard to project status information after May 31, 2011 program close. DCEO improved the timeliness of processing end-of-year applications by more than a month over previous years, and provided a stable project count of PY3 participants from mid-June onward.

Default Savings Review

DCEO default savings assumptions are built into the new tracking system as lookup tables for kWh savings per unit assumptions by measure and building type. The source of the default

values are ComEd's measure default savings as documented in ComEd's Appendix A of the Business Prescriptive program operations manual.[10] DCEO default savings are differentiated by four building types from the ComEd assumptions: College/University, Medical, Office, and K-12 School. To generate savings for tracking, DCEO must select one of these four building types to represent the project. For projects in the local government sector, one of the four default building types must be matched to the project, based on program staff judgment of operating hours and space function.

During PY4, DCEO should work with the evaluation team to explore whether additional building types or modifications to existing building types would be beneficial for reporting energy savings. Although the current set of building types work reasonably well, they were developed by ComEd for commercial businesses and not specifically designed for public building types. After three years of Standard program operation and evaluation cycles, plus work conducted by SEDAC, a substantial set of site collected data is available.

The evaluation team reviewed ComEd's measure default savings for PY3 that were the basis for DCEO's default values. The PY3 review was less extensive than conducted in PY1 and PY2 because ComEd has addressed previous recommendations, and many measures and assumptions are unchanged. Measures reviewed by the evaluation team in greater detail for PY3 were refrigeration measures, food service measures, and variable speed drives, and the PY3 default values were judged to be reasonable by the evaluation team.

Tracking System Check for Default Values Implementation

We compared DCEO's default values in their new tracking system against ComEd's PY3 default values – approximately 2,000 individual values. For most measures, the DCEO kWh per unit savings assumptions match ComEd's PY3 values exactly, or had insignificant differences due to rounding. A few measures did not match ComEd's PY3 values:

- It appears DCEO has switched the default values for LED channel signs less than two feet with the default for signs over 2 feet. This measure was eliminated for PY4.
- ComEd implemented revisions to their HVAC measure offerings and default values for PY2 and PY3, and these updates were not reflected in all of the DCEO PY3 default values. We have no objection to DCEO retaining PY1 values where used until the statewide deemed values become effective. The evaluation team can assist DCEO in coordination with ComEd.
- DCEO uses ComEd assumptions from PY1 for screw-in compact fluorescent lighting and from PY2 for refrigeration economizers. ComEd did not offer these measures in

[10] KEMA, *Appendix A - Prescriptive Measures,* (file provided: "ComEd Workpapers 6-1-10.doc"). This document is sometimes referred to as a Technical Reference Manual (TRM) or as "ComEd Workpapers June 1, 2010 version".

PY3. We have no objection to DCEO retaining these values until the statewide deemed values become effective.

- ComEd does not offer traffic signal incentives. DCEO's default values were reasonable for ex ante savings reporting.

Our comparison is attached in Appendix 5.4.

During PY4, prior to closing out year-end ex ante savings estimates, the evaluation team will assist DCEO by reviewing default values and ex ante savings calculation outputs to ensure that tracking system output matches values expected by the evaluators.

3.1.2 Gross Program Impact Parameter Estimates

Ex post gross program impacts were developed for the Standard program based on engineering file review, participant interviews, and site M&V for a sample of applications.

Gross Impact Adjustments Triggered by the Participant Telephone Survey

A brief set of questions in the CATI survey was asked regarding lighting hours of use to support the gross impact evaluation. Gross impacts were adjusted *only* for those projects in the engineering file review group. Of the 78 completed telephone interviews, six covered projects that were also in the engineering review sample for gross impact evaluation. Of the six projects, four provided substantial increases to energy savings realization rate due to longer hours of use than assumed by default values, while two projects had hours of use adjusted downwards based on participant responses.

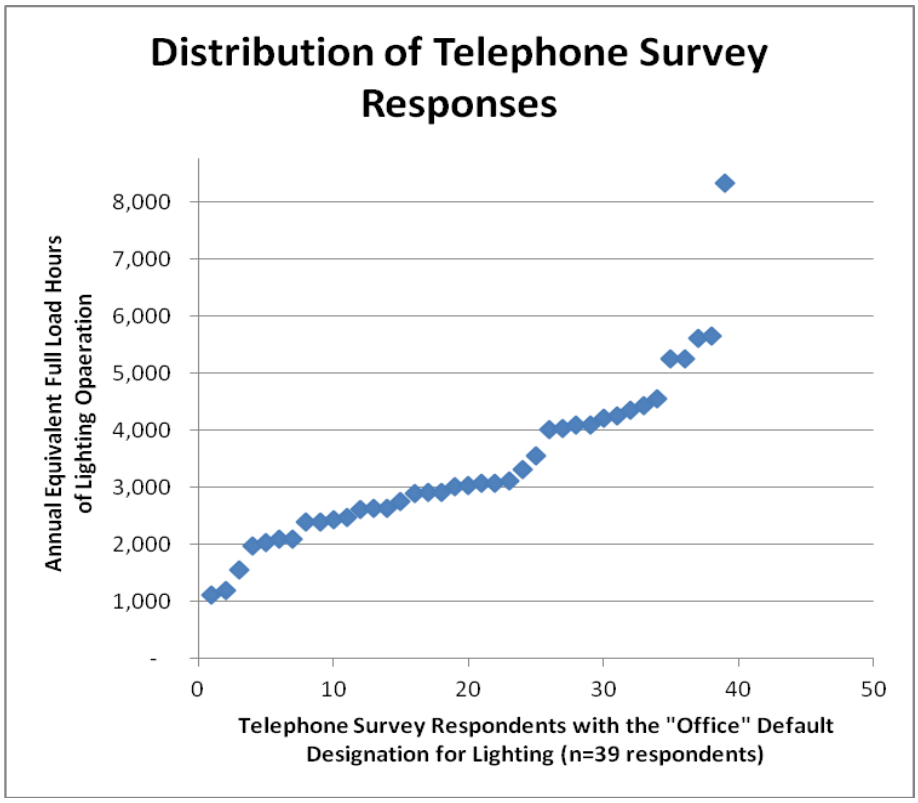
Table 3-1 below provides the un-weighted average annual equivalent full load hours (EFLH) of operation for lighting among all respondents (64) who provided complete responses to the lighting hours of operation questions.

Table 3-1. Participant Reponses to Lighting EFLH Questions by Public Sector Type

Public Sector Type	Respondent Count	Respondent Un-weighted Average Equivalent Full Load Annual Lighting Hours	Typical Default Annual Lighting Hours of Use and Building Type
Local Government	38	3,425	2,808 (Office)
K-12 Schools	23	3,278	1,873 (K-12 School)
Federal Government	1	2,628	2,808 (Office)
State Government	1	2,390	2,808 (Office)
College	1	4,618	3,433 (College)
TOTAL	64	3,362	

Among respondents with lighting projects that were assigned an "office" building type as a default value, the distribution of responses for annual equivalent full load hours of use is provided in the figure below.

Figure 3-1. Telephone Survey Responses for Participants with "Office" lighting



Realization Rates for the Standard Program

There are two basic statistical methods for combining individual realization rates from the sample projects into an estimate of verified gross kWh savings for the population when stratified random sampling is used. These two methods are called "separate" and "combined" ratio estimation.[11] In the case of a separate ratio estimator, a separate gross kWh savings realization rate is calculated for each stratum and then combined. In the case of a combined ratio estimator, a single gross kWh savings realization rate is calculated directly without first calculating separate realization rates by stratum.

The separate ratio estimation technique was used to estimate verified gross kWh savings for the Standard program. The separate ratio estimation technique follows the steps outlined in the California Evaluation Framework. These steps are matched to the stratified random sampling method that was used to create the sample for the program. The standard error was used to estimate the error bound around the estimate of verified gross kWh. The results are summarized in Table 3-2 and Table 3-3 below.

Table 3-2. Gross Impact Realization Rate Results for the Standard Sample

Sampling Strata	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kWh Realization Rate	kWh Weights
1	20,890,748	23,181,007	1.11	0.390
2	4,175,611	3,435,079	0.82	0.256
3	1,528,882	1,864,541	1.22	0.354

[11] A full discussion and comparison of separate vs. combined ratio estimation can be found in Sampling Techniques, Cochran, 1977, pp. 164-169.

Table 3-3. Gross kWh Realization Rates and Relative Precision at 90% Confidence Level

Sampling Strata	Relative Precision ± %	Low	Mean	High
Stratum 1	0%	1.11	1.11	1.11
Stratum 2	17%	0.68	0.82	0.96
Stratum 3	16%	1.02	1.22	1.42
Total kWh RR	7%	1.01	1.09	1.17

The realization rates analyzed by strata form the basis for estimating the overall realization rate applied to total ex-ante gross program savings at the stated confidence level and relative precision.

Below we present additional summaries of the verification sample results by other factors, including M&V approach and public sector customer type, to provide insight into the findings. Realization rates shown below are not statistically valid at the 90/10 level of confidence and relative precision. The results are summarized in Table 3-4 and Table 3-5 below.

Table 3-4. Gross Impact Realization Rate Results for the Standard Sample – by M&V Approach and Strata

M&V Approach	Strata	Application Count	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kWh Realization Rate
On-Site	1	8	20,890,748	23,181,007	1.11
	2	8	1,869,742	1,868,428	1.00
	3	9	752,420	792,494	1.05
Engineering File Review	1	0	-	-	-
	2	6	2,305,869	1,566,651	0.68
	3	21	776,462	1,072,047	1.38
Total		52	26,595,241	28,480,627	1.07

Table 3-5. Gross Impact Realization Rate Results for the Standard Sample – By Public Sector

Public Sector	Application Count	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kWh Realization Rate
Local Government	26	16,682,655	17,160,842	1.03
K-12 Schools	19	2,192,672	2,525,754	1.15
Federal Government	2	2,174,610	4,338,206	1.99
College	1	308,880	221,441	0.72
University	4	5,236,424	4,234,384	0.81
Total	52	26,595,241	28,480,627	1.07

3.1.3 Gross Program Impact Results

Based on the gross impact parameter estimates described previously, gross program impacts were derived for the PY3 Standard program. The results are provided in Table 3-6.

Table 3-6. Gross Parameter and Savings Estimates

Segment	kWh, Ex Ante	kWh, Ex Post	kWh RR
Standard	53,634,742	58,328,889	1.09

Some general observations from the gross impact sample:

- The realization rate for kWh was 1.09 in PY3. Individual measures and projects had realization rates greater and less than 1.09, however the overall value of 1.09 is lower than the value of 1.27 observed for PY2. The primary factor in the high realization rate in PY2 was verified hours of use that were higher than default values on a significant number of sampled projects. In PY3, a large proportion of program savings was for traffic signal projects, including 36% of overall program savings with the City of Chicago, and these sampled projects were not subject to hours of use adjustments.

- In PY3 it was commonly found that K-12 schools had longer hours of use than the default value of 1,873 hours per year. In the telephone survey, 21 of 23 respondents reported lighting operation, adjusted to annual equivalent full load hours of use, that were greater than the default value of 1,873 hours. For PY4, ComEd has increased the

default value to 2,829 hours for K-12 schools, and data from the PY3 Standard evaluation supports the use of ComEd's higher value.

- DCEO commonly selected the office building type for lighting default values with projects for local, state, and federal government participants (choices were office, medical, school, and college/university). In the telephone survey, 24 of 39 respondents assigned the office building type reported lighting operation, adjusted to annual equivalent full load hours of use, that were greater than the office default value of 2,808 hours. There was significant variation in equivalent full load hours across respondents, from a low of 1,109 hours to a high of 8,322 hours, with an average of 3,371 hours. The field verification also observed a wide variation in site verified lighting hours of use. A factor in the wide range of verified hours of lighting use for the office default building type was the diverse functions of the spaces that fell into this default category. These included public service and safety buildings with 24 hour occupation in all or parts of the facility, general public facilities with extended hours, typical offices, and lightly used local government facilities. Although the average verified hours of use was greater than the default value of 2,808 hours, we recommend that DCEO consider expanding the number of buildings types from which to select a default rather than only raise average hours of use. It appears that the current office default type could be split into two building types: "office", and "public service extended operation" and possibly a third added "public service continuous operation". The "office" building type could remain at the current default value of 2,808 hours, while "continuous operation" would be appropriate for 8760 hour facilities. The "extended operation" default would need further analysis, but a value of 4,000 to 4,400 hours could be appropriate.

- As K-12 schools and lighting projects with an office building type default were common projects in PY3, the primary factor raising the average realization rate for the overall program above 1.00 was a finding of hours of use that were longer than used in default savings in these two building types. As suggested above, adjusting the default lighting hours higher in the case of K-12 schools and adding additional building types with longer default hours to replace the single office type would provide DCEO with higher ex ante savings and could produce a realization rate closer to 1.00 in future evaluations.
.

- One of the adjustments that increased or decreased ex post impacts, depending on the project, was quantity adjustments. As a general qualitative finding, DCEO was quite accurate on measure quantities claimed, with a common finding being exact or within one or two percent. There was one instance of a T8 lamp and ballast measure recording fixture quantities when the verified measure quantity should have been based on lamps – this resulted in a four-fold quantity increase for the measure.

- One measure where fixture counts were not as accurate was on traffic signal modules. Some quantities for three-lamp modules had recorded number of lamps (3) rather than number of modules (1). These instances sometimes occurred on application forms that had correctly entered number of modules for some of the traffic lighting measures. This finding occurred on projects #3398, #3425, #3540, and #3579 in our sample. These are stratum 2 projects, and this was a significant factor in contributing to the relatively lower realization rate seen in this stratum. If these four large projects had a realization of 1.0, the realization rate for stratum 2 would have been 1.03 rather than 0.82, and the overall realization rate for the program would have been 1.13 rather than 1.09.

- There was an instance of ineligible equipment for the measure "high performance or reduced wattage 4 foot T8 lamp and ballast." This measure requires T12 lighting as a baseline and both the installed lamp and ballast must meet eligibility specifications to claim the full default lamp and ballast savings. In these cases, we determine savings based on alternative measures if components are eligible. On project #3166, the baseline and ballast did not qualify, and instances of this measure were converted to "reduced wattage T8 lamp only", resulting a lower realization rate.

- There are sampled projects where verified savings will differ from what DCEO has claimed, but do not represent any kind of error by DCEO in recording savings. Some adjustments to energy savings were made based on verified performance of baseline and installed equipment performance being different than default assumptions. These adjustments were not factors under control of DCEO in the Standard program, but are inherent in setting default values that are intended to serve as averages that will represent expected participants. For example, the default savings for some lighting measures, such as permanent lamp removal, aggregates many combinations of lamps and ballasts of different wattages into a single average. When verifying this measure in the field, the evaluators often find a wattage impact that differs from the assumed average. This wattage difference leads to a difference between what DCEO claimed for savings and what the evaluation team estimates based on site collected data. The realization rate differs from 1.00, even though DCEO's the savings estimate correctly adheres to the default savings methodology. The magnitude of this type of adjustment is small in the Standard program, typically under ± 10 percent for the measures involved. If a trend is seen where evaluation findings are consistently lower or higher than default values, it suggests a revision should be made to the default value (for example, as seen with K-12 school lighting hours of use).

3.1.4 Net Program Impact Parameter Estimates

Once gross program impacts have been estimated, net program impacts are calculated by multiplying the gross impact estimate by the program Net-to-Gross (NTG) ratio. As mentioned above, the NTG ratio for the PY3 Standard program was estimated using a customer self-report

approach supplemented by vendor or designer interviews when triggered. This approach relied on responses provided by program participants during the CATI telephone survey to determine the fraction of measure installations that would have occurred by participants in the absence of the program (free-ridership).

The Standard net-to-gross interview results were supplemented by the results of 14 Custom program interviews with project contacts that had combined Custom and Standard projects and reported a single decision making process was used for both measure types. If the customer has additional projects at other sites covering the same end-use, the survey asks whether the responses also apply to the other projects. If that is the case, the additional projects are given the same score and included in the sample.

The NTG ratio and relative precision at a 90% confidence level for the overall program is provided in Table 3-7.

Table 3-7. NTG Ratio and Relative Precision at 90% Confidence Level - Overall

Sample Strata	Population (N=449)	NTG Interviews (n=92)	NTG Sample (n=128)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	8	5	5	0.390	12%	0.53	0.60	0.67
2	40	7	26	0.256	4%	0.58	0.60	0.62
3	401	80	97	0.354	4%	0.73	0.76	0.78
Total	449	92	128	1.000	7%	0.61	0.66	0.70

Comparing PY2 and PY3, the mean NTG ratio decreased from PY2 (0.75) to PY3 (0.66). Although the PY3 results experienced a large increase in the number of smaller projects, as seen in stratum 3, these did not have a dramatic impact on the NTG ratio relative to PY2. The primary difference between PY2 and PY3 was that larger PY3 projects had substantially lower NTG ratios than in PY2, which had a NTG ratio of 0.70 for stratum 1 and 0.80 for stratum 2 projects in PY2. In PY3, some large projects had quite low NTG ratios, and a substantial fraction had results in the 0.60 to 0.65 range.

As discussed in the methodology section, quantifying free-ridership requires estimating what would have happened in the absence of the DCEO program. A customer with a high free-ridership score typically has made a decision and committed funds to an efficiency project prior to learning about the DCEO program, and would have been quite likely to implement the exact same measures at the exact same time (or within a year) had the DCEO program not been available. In such a case, relative less importance is assigned to DCEO by the participant for the rebate and other services offered by DCEO. It is frequently seen that larger customers with full-time facility managers knowledgeable in energy efficiency indicate less influence by the program in free-ridership scoring. Participants with *lower* free-ridership scores typically state

emphatically that they would not have pursued the project without DCEO funding and assistance.

One factor that accounts for the lower NTG ratio was that LED traffic signal projects tended to have a NTG ratio lower than the mean value of 0.66, and traffics signals were a large proportion of PY3 savings and sampled projects. The traffic signal projects identified factors unrelated to the DCEO program (for example, public safety) as influential in their decisions and responded with lower influence scores assigned to DCEO. Another factor was certain large institutional projects cited policies they were required to follow as the primary influence for implementing for energy efficiency projects.

Similar to PY2, the NTG ratio estimate for PY3 included a more complex "standard rigor" level of analysis conducted on larger projects. The expanded standard rigor analysis included additional questions regarding non-program influence factors and the possibility of triggering an interview with the vendor to determine the extent of program influence on the vendor, if the participant said the vendor was important to the decision to proceed with the project. For PY3, seven of 78 respondents in our Standard telephone sample went through the standard rigor approach, and two of the seven standard rigor interviews had responses that triggered follow-up interviews with two different design consultants. One designer interview resulted in an increase in the NTG ratio for that project, the other did not. The impact on overall NTG ratio of follow-up interviews was small, less 1 percent.

No adjustments were made to increase free-ridership in the Timing & Selection score for non-program influences, based on a review of participant responses and resulting scores. Non-program influences were weighed against program influences and open-ended comments made by participants during the interviews. Although some non-program influences such as government policy were given high importance by some respondents, there were other responses that indicated the program incentive and assistance were important in getting the organization to act on that policy and choose the measures that were installed.

In PY3, the evaluation team examined NTG ratios in the subgroup of the sample that mentioned receiving other "public sources" of funding for the implementation of the efficiency project discussed in the NTG interview. Specifically, 16 projects had self-reported during the interview that they had received funding of one of the following types:

- American Recovery and Reinvestment Act (ARRA)
- Energy Efficiency and Conservation Block Grant (EECBG)
- Illinois State Board of Education (ISBE)
- Illinois Clean Energy Grant

The NTG ratios for this group of 16 projects ranged from 0.17 to 1.00. The mean NTG ratio for this group including their 1 additional multiple-project, weighted by ex ante kWh, was 0.67. For

the group of Standard program NTG interviewees that did not mention one of the four other funding sources, the kWh weighted NTG ratio was 0.59. Although we did not generate a precision estimate for these subgroup estimates, it does not appear that receipt of other public funds was on average resulting in a NTG ratio that was lower than the mean value for the overall program.

Participant Spillover

The evidence of spillover from the CATI participant survey for the Standard program is presented in Table 3-8 below. These findings suggest that spillover effects for PY3 are relatively small, with only three respondents from the sample of 78 pursuing three measures (delamping, time-clocks for lighting, and room air conditioners) where a strong influence was indicated for the DCEO program. The three respondents were not in the impact sample and the potential savings could not be quantified from the responses. In PY2, the evidence for spillover was limited and therefore an enhanced effort to estimate it was not included in the PY3 evaluation plan. Although the evidence for participant spillover is limited again in PY3, the DCEO Standard program has reached a size (53.6 million kWh, 449 projects) where it would be worthwhile to attempt to quantify a small percentage spillover in PY4. Therefore, the Standard evaluation team will be conducting an enhanced effort to identify potential spillover candidates and quantify spillover in PY4.

Table 3-8. Evidence of Spillover in PY3 Standard from Participant Telephone Survey

Spillover Question	Evidence of Spillover
Since your participation in the DCEO program, did you implement any additional energy efficiency measures at this facility that did NOT receive incentives through any utility or government program?	Of the 78 respondents in the Standard sample, 16 said "Yes" (21%) and named an energy efficiency measure.
What type of energy efficiency measure was installed without an incentive?	Responses indicate number of measures by type mentioned by the 16 respondents: (3) T5 or T8 lamps or Lighting upgrades (4) CFLs, LED lamps, LED exit signs (3) Lighting Controls (4) VSD in HVAC (5) HVAC, Unitary HVAC, and room AC (9) "Other" measures
On a scale of 0 to 10, where 0 means "not at all significant" and 10 means "extremely significant," how significant was your experience in the DCEO program in your decision to implement this energy efficiency measures?	Eleven of sixteen respondents provided a score of zero or don't know regarding all mentioned measures, but five respondents provided a non-zero score on eight measures: (5 measures) Ratings of 4, 5 or 6 (1 measure) Rating of 8 (2 measures) Rating of 10
If you had not participated in the DCEO program, how likely is it that your organization would still have implemented this measure? Use a 0 to 10, scale where 0 means you definitely would NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure?	Eight respondents provided a score of 10 regarding all measures, but for the other eight respondents who provided an answer less than 10 regarding 15 measures: (6 measures) Rating between 0 and 3 (7 measures) Rating between 4 and 6 (2 measures) Rating between 7 and 9

3.1.5 Net Program Impact Results

Net program impacts were derived by multiplying gross program savings by the estimated NTG ratio. Table 3-9 provides the program-level evaluation-adjusted net impact results for the PY3 Standard program.

Table 3-9. Program-Level Evaluation-Adjusted Net kWh Impacts for PY3

Segment	Ex Ante Gross kWh	Ex Post Gross kWh	kWh RR	Ex Post Net kWh	NTGR (ex post gross)
Standard	53,634,742	58,328,889	1.09	38,236,880	0.66

3.2 *Process Evaluation Results*

The process evaluation of the Standard Program covered a range of topics, including program participation, program design and implementation, program partnerships, trade allies, marketing and outreach, barriers to participation, program drop-outs, public sector procurement process, and participant satisfaction. Data sources for the process evaluation include a review of program materials, three in-depth interviews with DCEO staff, ten in-depth interviews with program participants regarding the equipment procurement process, five in-depth interviews with program drop-outs, and a CATI telephone survey with 77 program participants. Telephone survey respondents are nearly evenly divided between customers in ComEd's service territory (38) and customers in Ameren's service territory (39).

3.2.1 Participant Profile

In PY3, 305 organizations completed a total of 449 standard projects that accounted for over 53.6 GWh of ex-ante gross savings.[12] PY3 participants represent a range of sectors. Key observations, by sector, are:

- Local governments represent the largest share of projects (58%), participants (57%), and energy savings (62%). K-12 schools account for the second largest share of projects (35%), participants (35%), and energy savings (19%). While most local government projects are small, this sector accounted for the single largest Standard Program project in PY3 (11 GWh, or 21% of total program savings).
- Projects in the university and federal government sectors tend to be larger than those in other sectors (average of 708 MWh and 462 MWh, respectively). Three university projects and two federal government projects are among the eight largest projects in PY3.
- Community colleges and state government projects represent the smallest shares of projects (2% each), participants (2% each), and energy savings (1% each).

Table 3-10 summarizes the distribution of PY3 projects, participants, and energy savings by sector.

[12] Gross savings reported in this section are based on the program tracking database of August 2, 2011.

Table 3-10. Distribution of Projects, Entities, and Savings by Sector

Sector	Projects		Participants		Projects / Participant	Ex Ante Gross Savings		kWh/ Project
	#	%	#	%		kWh	%	
Local Government	260	58%	174	57%	1.5	33,306,792	62%	128,103
K-12 Schools	155	35%	106	35%	1.5	10,025,921	19%	64,683
Universities	8	2%	5	2%	1.6	5,662,935	11%	707,867
Community Colleges	11	2%	7	2%	1.6	776,496	1%	70,591
Federal Government	7	2%	6	2%	1.2	3,231,251	6%	461,607
State Government	8	2%	7	2%	1.1	631,347	1%	78,918
TOTAL	**449**		**305**		**1.5**	**53,634,742**		**119,454**

Source: DCEO Program Tracking Database

In PY3 Standard Program participation increased significantly compared to PY2, from 286 projects completed by 226 customers to 449 projects were completed by 305 customers. Accordingly, the ex ante gross savings increased by 75% from 30.7 GWh in PY2 to 53.6 GWh in PY3. Ex post net savings increased by 31% from 29.2 GWh to 38.2 GWh from PY2 to PY3.

Key participation trends over the three program years include:

- The total number of projects in PY3 increased by 57% over PY2 (449 vs. 286). The most significant increase came from the local government sector, where the number of projects almost doubled between PY2 and PY3 (from 138 to 260). State government also saw a jump, from only three projects in PY2 to eight in PY3. Participation by universities decreased from 20 projects in PY2 to only eight in PY3 (although the PY3 projects were larger so the total energy savings increased slightly). The share of projects implemented by local governments has steadily increased over the three program years, from 39% in PY1 to 48% in PY2 and 58% in PY3. The share of K-12 schools has remained relatively constant over the years, representing a little more than a third of projects (35%).
- The total number of participants has increased by 35% over PY2 (305 vs. 226). The majority of that increase came from the local government sector (174 participants in PY3 compared to 116 in PY2). The distribution of participants across sectors in PY3 remains nearly identical to that of previous years: local governments represent the majority of participants, K-12 schools represent about one third, and all other sectors represent approximately 2% each of the participant population.
- The largest change between PY2 and PY3 occurred with regard to energy savings, which increased by 75%. Local governments, in particular, showed the most dramatic increase in PY3, nearly quadrupling its savings from PY2 (33.3 GWh vs. 8.8 GWh). As a result,

local governments have shifted from representing about a third of ex ante savings in previous years to now generating over half. Community college projects saw the biggest drop in savings in PY3, a 65% decrease compared to PY2.

- The average project size increased slightly, from 107 MWh per project in PY2 to 119 MWh in PY3. This is largely driven by increases in the average size of projects implemented by universities and local governments. All other sectors saw somewhat of a decrease in average project size compared to PY2.

The figures below compare the number of projects, participants, ex ante gross energy savings, and average project size by sector and program year.

Figure 3-2. Projects by Sector and Program Year

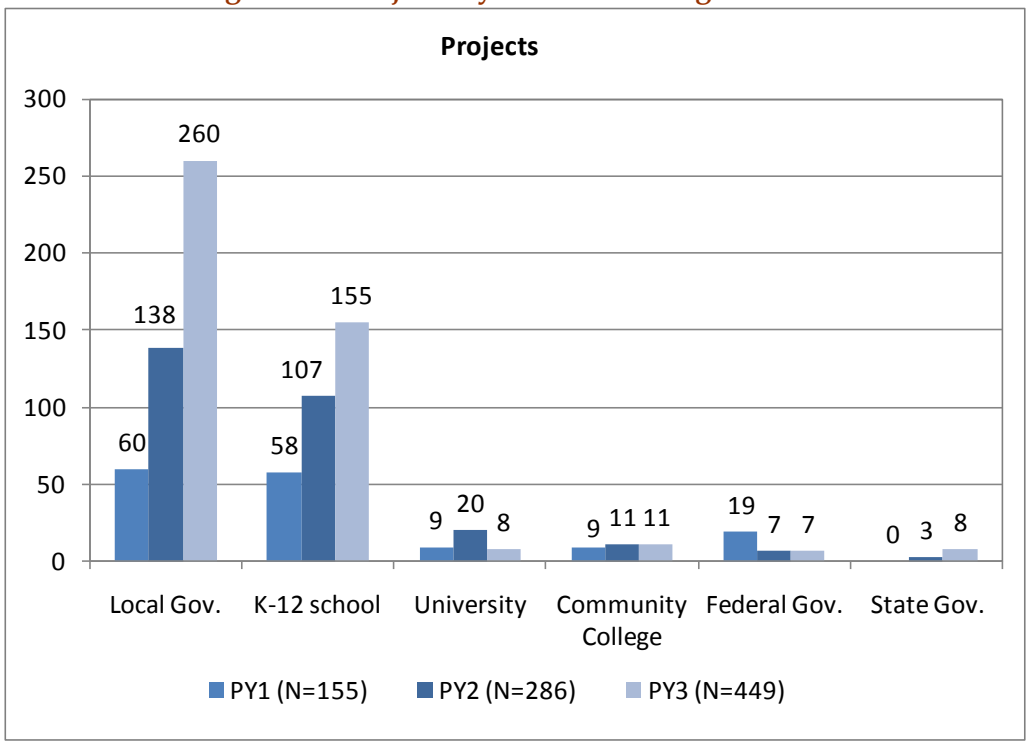


Figure 3-3. Participants by Sector and Program Year

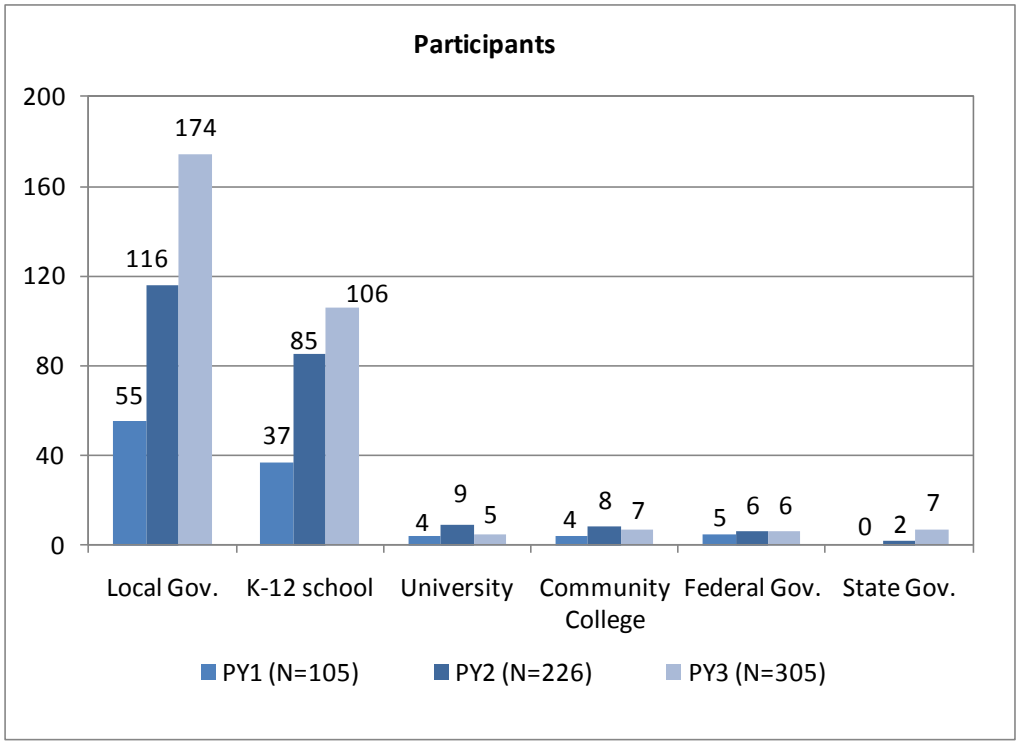


Figure 3-4. Energy Savings by Sector and Program Year

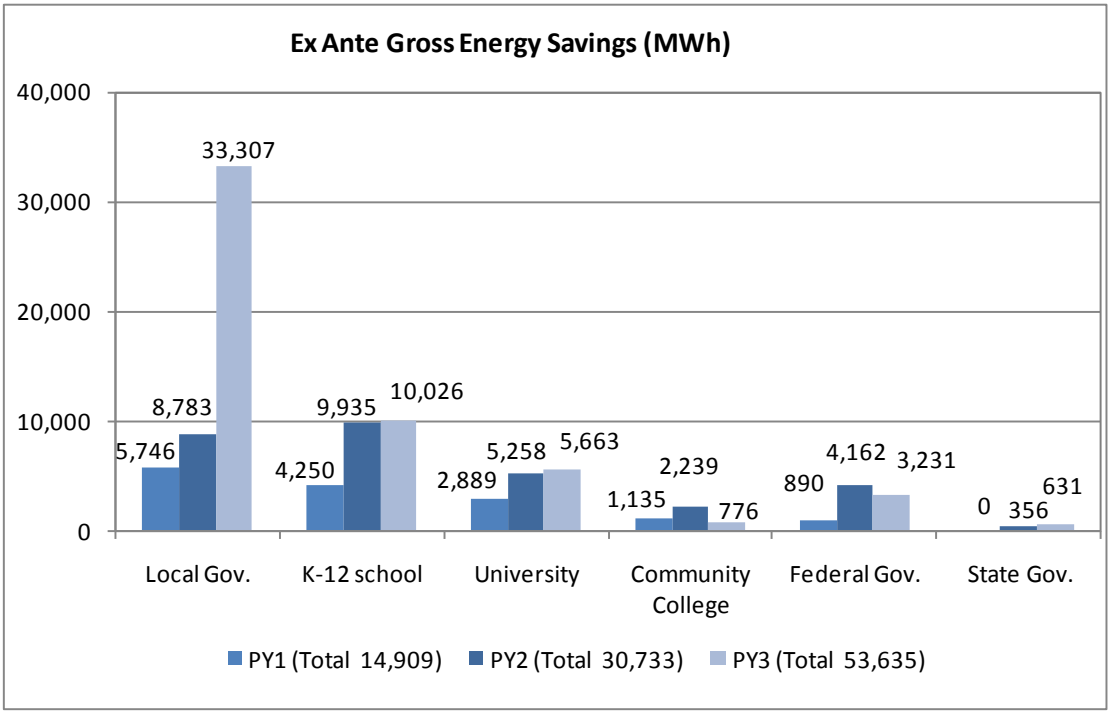
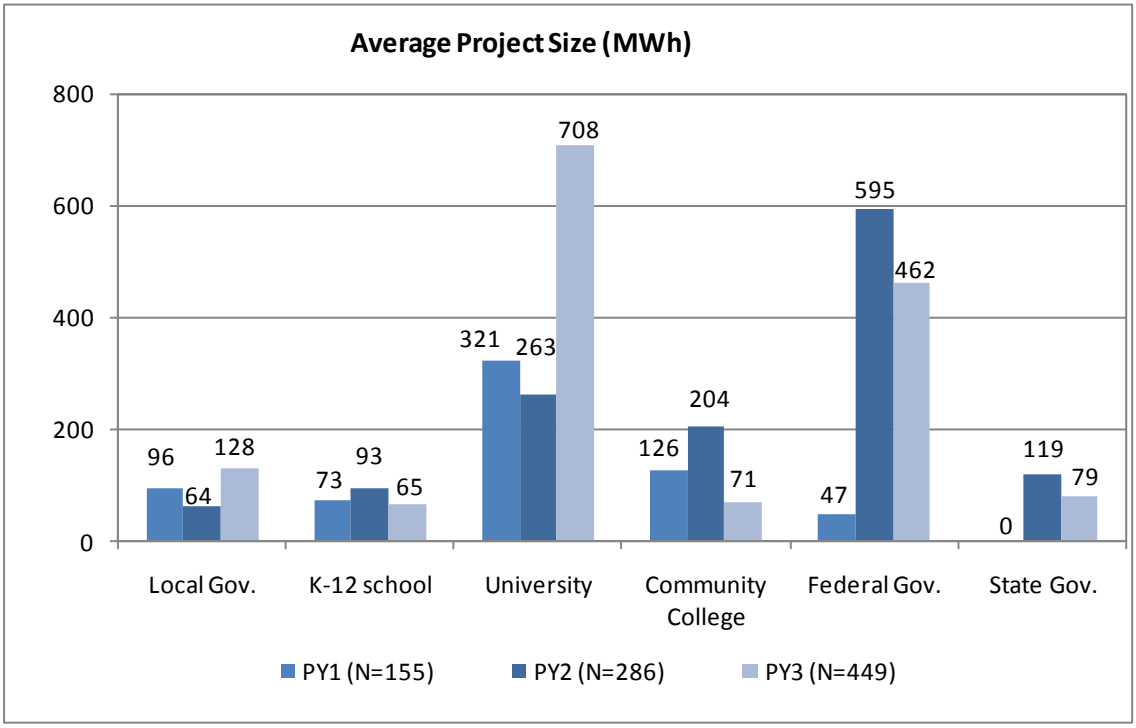


Figure 3-5. Average Project Size by Sector and Program Year



Source: DCEO Program Tracking Database

3.2.2 Program Design and Implementation

In PY3 several key changes were made to the design and implementation of the Standard Program:

- **Incentives:** Program incentive caps were increased to $300,000 (from $200,000 in PY2). A "carve-out" group was developed consisting of local governments, K-12 schools, and community colleges that were offered increased incentive levels.
- **Promotions:** The program conducted two promotions with increased incentive levels for specific sectors or for specific measures.
- **Resources:** The program developed a database to enhance the previous system of tracking participation data in an Excel workbook. In addition, the program hired three new staff members.
- **Partnerships:** The program began partnering with the Illinois State Board of Education (ISBE) to channel K-12 school participants into the program. The program also leveraged its relationship with the Illinois Association of Regional Councils (ILARC), to 1) channel projects with EECBG funding into the PSEE Program, and 2) offer a 20% bonus for local government entities that applied for but did not receive EECBG funding.
- **Application Assistance Providers:** The program implemented an application assistance pilot program in PY3. DCEO selected a small number of Application Assistance

Providers (AAPs) through a competitive bidding process. These trade allies were listed on the program website and were paid a fee per kWh for helping customers through the application process (AAPs received one payment when a pre-approval application was submitted and a second payment when a final application was submitted). This pilot will not be continued in future years.

The following sections provide more information about these and other changes implemented in PY3.

Incentives

In order to induce participation, a few changes have been made to the program incentive structure in PY3. First the incentive cap was increased from $200,000 in PY2 to $300,000 in PY3. Despite this increase, over a quarter of participants report that the scope of their project was either limited (23%) or somewhat limited (3%) by the incentive cap.

Also, a "carve out" group was developed in PY3. This group (local governments, K-12 schools, and community colleges) received higher incentive levels than federal and state governments, and universities.

Promotions

The program offered two promotions in PY3, the IEN Lighting Special and the Non-EECBG 20% Bonus.

Illinois Energy Now Lighting Special

The program conducted a lighting special where incentives for certain lighting measures were increased by 20-50%. The PY3 lighting special leveraged the lessons learned in PY2: While the PY2 Green Spring Sale was very successful in increasing participation, the timing of the promotion – towards the end of the program year – resulted in a backlog of payment processing. As a result, the program planned its PY3 lighting special earlier in the program year (December through April).

Program staff found the lighting special to be a success, with over a quarter of Standard projects (29%) participating in this promotion.[13] Of the 77 participants who completed the survey, 25 received the lighting special incentive. Nearly all of them (88%) are aware that they participated in the promotion; 64% were aware at the time they decided to upgrade their lighting. Most lighting special participants found out about the promotion through a contractor, supplier, or vendor (45%), an e-mail (14%), or DCEO (14%).

[13] Based on a data excerpt entitled "Promotions," received from DCEO on August 22, 2011.

Notably, lighting special participants are more likely to report that they are "very satisfied" (a rating of 10 on a scale of 0 to 10) than others with DCEO overall, the program overall, the incentive amount, and communication with DCEO staff. However, more than half of those who were aware of the increased incentive (52%) say they would have been likely to install exactly the same equipment with the regular incentive.[14] Given these responses, it is unclear how effective the bonus incentive was in attracting new projects.

Non-EECBG 20% Bonus

In collaboration with the Illinois Association of Regional Councils (ILARC), the Standard and Custom Programs offered a 20% bonus for local governments in PY3 (the Non-EECBG 20% Bonus). This bonus was available for local governments that submitted Federal Energy Efficiency & Conservation Block Grant (EECBG) applications to their Regional Planning Agencies but were not selected for funding. The promotion was implemented to increase participation among local government entities. Based on program records, only four Standard projects (or less than 1% of all Standard projects) received this bonus.

Program Resources

Several changes took place in PY3 with regard to program resources:

- **Database development:** According to program staff, the development of a program tracking database was a key activity in PY3. Deployment of a new database system was intended to reduce administrative burden and allow multiple staff to enter data into the database at the same time. Staff members agree that the database has allowed them to be more productive and efficient in terms of processing paperwork and generating reports. However, the development of the database, along with database user training, required substantial effort and time on the part of program staff. Moreover, program staff point out that entering all related project data into the system is more time consuming than the previous system (because more information is captured) and that many report automation capabilities that would be useful in conducting their work were not yet available in PY3.
- **Increased Staffing:** In PY3, DCEO hired more staff, bringing the total to nine staff members within the PSEE Program. Starting in PY2 and continuing in PY3, the PSEE Program have leveraged employees hired to support the implementation of the American Recovery and Reinvestment Act of 2009 (ARRA). These employees will transition full time to the PSEE Program as ARRA work phases out by January 2012. According to program staff, the additional resources have allowed the program to keep

[14] "Likely" is defined as a score of 7 to 10 on a scale from 0 to 10, where 0 is "not at all likely" and 10 is "extremely likely."

up with the increased volume of applications in PY3. However, other demands on staff's time (including the preparation for the integration of natural gas programs in PY4 and the processing of stimulus fund-related incentives) have continued in PY3.

- **Staffing Segmentation:** In PY3, DCEO transitioned toward more staff specialization where individual staff members are assigned projects based on the sectors and utility service territories of the participant. This allows participants to work with the same staff member throughout their project and across years.

Participation and Application Process

The participation process has remained largely unchanged from previous years. Every Standard project still has to undergo several steps, including project application, final paperwork, payment processing, and incentive disbursement. In addition, certain projects are subject to pre- and post-inspections to qualify for an incentive.

Similar to previous years, the application process includes a pre-approval application (not required) and a final application. Only minor changes were made to the PY3 application process:

- **Carve-out Applications:** Two separate application forms were developed for different sectors. As part of an effort to direct three quarters of its funding to specific sectors, a "carve-out" group (local government, K-12 schools, and community colleges) was developed. The carve-out group was provided with a distinct application form that reflects the higher incentive levels compared to non-carve-out entities (federal and state government and universities).
- **Project Timelines:** In PY3 program participants were required to submit the final application within 45 days of project completion, as opposed to 60 days in previous years.
- **Application Assistance Providers:** In PY3 the program implemented a pilot effort that used Application Assistance Providers (AAPs) to help customers with the application process. As part of this effort, the program selected a small number of trade allies and listed them on the program website. However, this pilot was not as successful as expected and will not continue in future years (see Trade Allies section for further details).

A majority of participants (73%) fill out the program paperwork themselves. Most of these customers (80%) feel that the application forms clearly explain the program requirements and participation process. More than two-thirds of those who filled out the paperwork themselves (68%) rate the application process as easy, but some (11%) rate the application process as

difficult.[15] Participants in the lighting special are significantly more likely to rate the application process as easy than those who did not receive these incentives (89% vs. 58%). Overall, participants appear to find the application process more difficult than in PY2: in PY3, the average rating was 6.9 (in the "neutral" range) compared to 7.7 (in the "easy" range) in PY2.

In addition, the most common drawback to participating in the program, identified by participants, is that the paperwork is too burdensome (13%).

3.2.3 Program Partnerships

DCEO has developed a number of partnerships that help channel participants into the program and support participants through the participation process. Program staff emphasized the importance of the partnerships the program has maintained over the years and those that were newly developed in PY3.

Smart Energy Design Assistance Center

The Smart Energy Design Assistance Center (SEDAC) continues to be one of the program's closest partners. SEDAC currently supports several key functions for the PSEE Program. These functions are generally conducted in collaboration with DCEO and supported by DCEO funding. They include producing and distributing marketing materials; educating public entities about the PSEE Program; and providing technical design and project implementation assistance. One DCEO staff member notes that expanding SEDAC's role in the program in the future would be beneficial, and plans have been made to enlist SEDAC in the development of a trade ally network in PY4.

Results from the participant survey confirm that SEDAC plays a role in supporting DCEO and that it is effectively channeling participants into the PSEE Program. Nearly a third of program participants (29%) recall attending a SEDAC event that discussed the PSEE Program, and more than a quarter (26%) have received information about the PSEE Program through the SEDAC newsletter. In addition, 19% received technical assistance from SEDAC.

Of participants who used a contractor, most did not use a contractor affiliated with SEDAC (45%), or they did not know if their contractors is affiliated with SEDAC (49%). However, nearly half of them (43%) find it important that their contractor is associated with SEDAC or an energy efficiency program.[16]

[15] "Easy" is defined as a score of 7 to 10 on a scale from 0 to 10, where 0 is "very difficult" and 10 is "very easy." "Difficult" is defined as a score of 0 to 3.

[16] A rating of 7 to 10 on a scale of 0 to 10, where 0 is "not at all important" and 10 is "very important."

Illinois Association of Regional Councils

The program targets 75% of its funding towards local governments, K-12 schools, and community colleges. To achieve this level of participation, DCEO has partnered with other relevant public organizations, including the Illinois Association of Regional Councils (ILARC). As part of this effort, DCEO provided training to ILARC's Regional Planning Agencies on PSEE Program opportunities. ILARC guidelines required communities that received EECBG funds to also apply under the PSEE Program, where eligible.

Based on the program tracking database, the number of local government projects in PY3 increased by 88% compared to PY2. Program staff estimates that as many as 100 PSEE applications were generated through this partnership; however, some of these applicants dropped out of the program. The final PY3 program tracking database shows that a total of 81 standard and custom projects received EECBG or Non-EECBG 20% Bonus funding; 73 of these were standard projects (16% of all standard projects). Over a quarter (27%) of participants who say they received funding from another public source (n=26) say it was EECBG funding, and all say it was an important factor in their decision to implement the project.[17]

Illinois State Board of Education

In PY3, the Illinois State Board of Education (ISBE) began awarding Energy Efficiency Grants, dollar for dollar state matching grants providing up to $250,000 for energy efficiency projects in schools. All school districts, charter schools, vocational centers, or public university laboratory schools are eligible. DCEO collaborated with ISBE by sharing marketing and outreach efforts and by channeling participants into each others' programs. Participants were then incentivized by each entity for eligible measures. In PY3, the number of K-12 school participants in the Standard Program increased by 23% compared to PY2.

Ameren Illinois Utilities and ComEd

In PY3, DCEO continued to leverage Ameren Illinois Utilities and ComEd's activities in promoting the PSEE Program. The three entities coordinate through monthly conference calls in which marketing and outreach and other issues are discussed. The utilities include DCEO at events and in outreach efforts. Like in previous years, DCEO helped fund, co-sponsor, and attend some larger PY3 outreach events with the utilities.

DCEO continues to conduct training sessions for utility account managers. Program staff remarked that account managers are more knowledgeable about and engaged in the PSEE Program each year. Some account managers provide marketing support while others simply refer public sector customers to DCEO.

[17] A rating of 7 to 10 on a scale of 0 to 10, where 0 is "not at all important" and 10 is "very important."

Participant survey responses also indicate that account managers play a role, albeit a small one, in supporting the Standard Program:

- Nearly one third of program participants (31%) report having a utility account manager. Notably, ComEd PSEE participants are significantly more likely to have an account manager than Ameren Illinois Utilities customers (50% vs. 13%).
- A little less than half of these individuals with an account manager (43%) recall discussing the program with their account manager, and the same percentage recall receiving assistance with project implementation from the account manager.
- Only 3% of participants who have an account manager first found out about the program from the account manager.

3.2.4 Trade Allies

In the first two program years, DCEO leveraged the trade ally networks of SEDAC, ComEd, and Ameren Illinois Utilities by referring potential participants to their lists of qualified contractors. In addition, DCEO directs marketing and outreach efforts towards these networks to inform trade allies of the PSEE Program.

In PY3, DCEO continued to leverage these existing networks, but made an attempt at developing its own network of contractors through a pilot effort under the Building Industry and Training Education Program (BITE). As part of this effort, DCEO selected a small number of Application Assistance Providers (AAPs) through a competitive bidding process. These trade allies were listed on the program website and were paid a fee per kWh for helping customers through the application process (AAPs received one payment when a pre-approval application was submitted and a second payment when a final application was submitted). Overall, program staff did not find this pilot effort to be a productive use of program resources. While AAPs assisted with 5% of standard projects (based on program records), the quality of applications was not substantially improved. As such, the AAP pilot was discontinued. DCEO plans to develop a formal trade ally network in PY4.

The telephone survey with program participants included questions about their use of contractors, their contractors' affiliation with SEDAC or the utility trade ally networks, and satisfaction with their contractors. Responses to the survey show that trade allies play an important role in the implementation of projects and channeling of participants:

- Most participants (88%) used a contractor or vendor for their project.
- The majority of participants (81%) mention a trade ally as the resource who provided the most assistance in the design and specification of the installed equipment: More than half (58%) named a contractor, equipment installer, designer, or consultant, and 22% named an equipment distributor, supplier, or vendor.

- The most common way participants in the PY3 lighting special learned about the promotion was through a trade ally (32%). Notably, those who participated in the lighting special are significantly more likely to have heard about the PSEE Program through a contractor or trade ally than those who did not (24% vs. 8%), indicating that this special offering induced trade allies to more actively promote the program.
- While only 6% of participants who used a contractor reported that their contractor was affiliated with SEDAC, 43% say that such an affiliation (either with SEDAC or a utility program) is important.[18]
- More than a quarter of participants (28%) first heard about the program from a trade ally.
- The vast majority of PY3 participants report that their contractor was able to meet their project needs (88%) and that they would recommend their contractor to others (94%).

These findings support DCEO's plans to develop its own trade ally network in PY4. This network is planned to be similar to that of the utilities where trade allies are enticed to participate by being eligible for incentives themselves.

3.2.5 Program Marketing & Outreach

In PY3, the PSEE Program was re-branded as *Illinois Energy Now* (IEN). The branding effort included usage of the IEN logo on all program marketing materials and revisions to the program website. DCEO produced limited marketing materials in PY3. However, the majority of participants who recalled seeing program marketing materials (84%) found them to be useful.[19]

Key marketing and outreach activities included:

- **Events:** DCEO gave presentations at 52 workshops, conferences, and meetings in PY3 with an estimated total attendance of over 2,500. Target audiences included a range of public sector groups and organizations, as well as trade allies. Overall, 29% of participants recall attending one of DCEO or SEDAC's events, and 23% recall hearing about the PSEE Program at a utility event. However, only 5% *first* learned about the program at an event.
- **IEN Promotion:** The IEN lighting special accounted for over a quarter of completed standard projects (29%). The most common way these participants learned about the promotion is through a trade ally (32%).

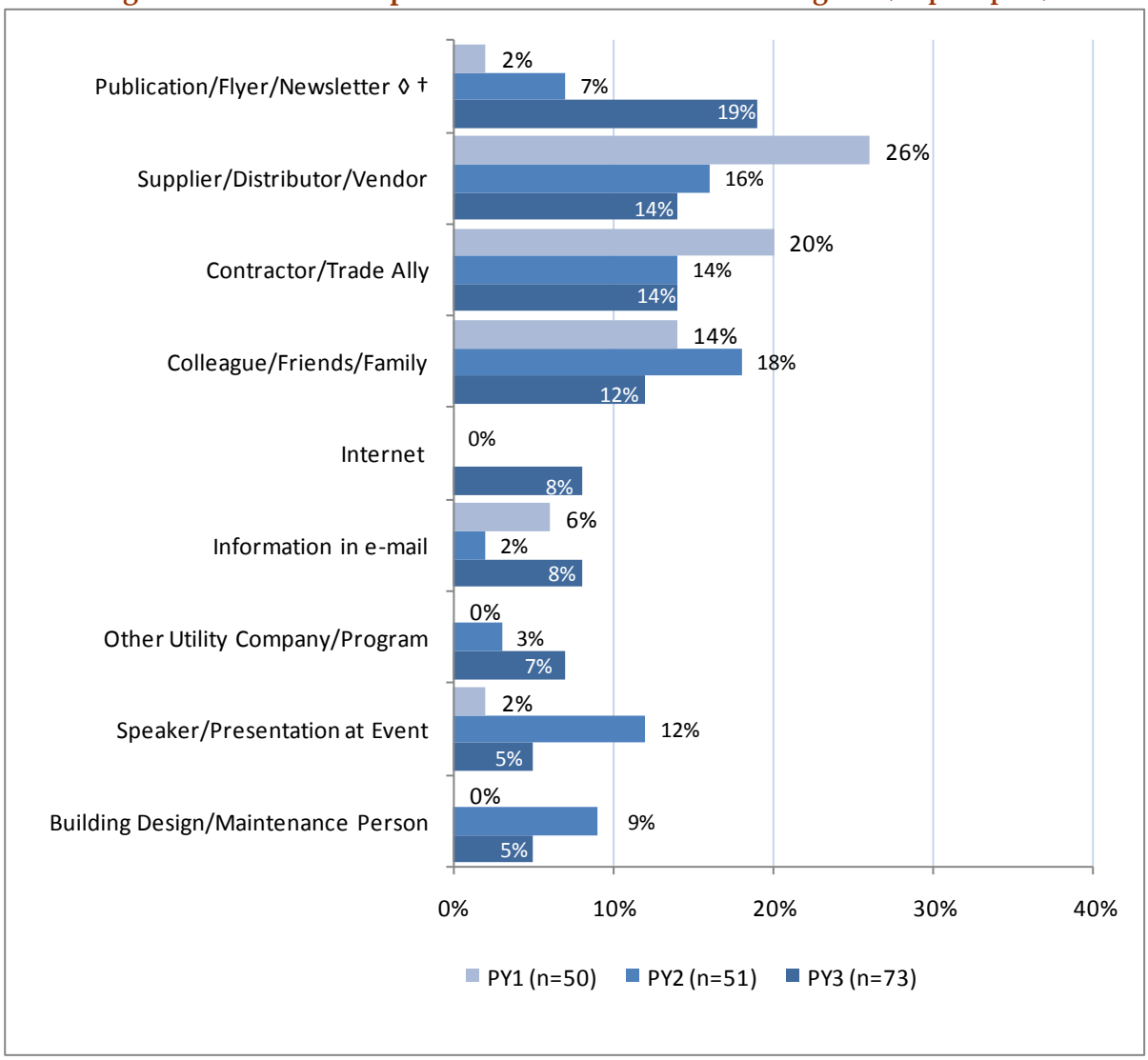
[18] "Important" is defined as a score of 7 or higher on a scale from 0 to 10, where 0 is "not at all important" and 10 is "very important."
[19] A response of "very useful" or "somewhat useful."

- **Webinars:** DCEO continued conducting the webinars in PY3. According to program staff, webinar attendance has steadily grown during PY3. Some webinars were attended by up to 300 people. For example, the program held one well-attended webinar promoting the IEN Lighting Special directed at Ameren Illinois Utilities and ComEd trade ally contacts. Nearly a fifth of participants (18%) heard about the program during a webinar.
- **Elected Officials:** DCEO made efforts to leverage the work of elected officials and representatives – such as state senators – by encouraging these officials to speak about the PSEE Program in their communities.
- **SEDAC Electronic Correspondence:** DCEO continued leveraging SEDAC's electronic newsletter and contact list to disseminate news and information about the program. About a quarter of participants (26%) recall seeing information about the program in the SEDAC/DCEO newsletter and over half (56%) recall seeing information about the program in an email.

In PY3, participants first found out about the program from a range of sources. The contribution of contractors and other market actors in promoting the program (28%) supports DCEO's planned efforts to develop its own trade ally network. In PY3 a significantly greater share than in previous years (and the largest share, 19%) learned of the program through print materials (publications, flyers, and newsletters).

Figure 3-6 summarizes the ways participant first heard about the program.

Figure 3-6. How Participants First Learned about the Program (Unprompted)



◊ Denotes a significant difference between PY3 and PY1 at the 90% confidence level.
† Denotes a significant difference between PY3 and PY2 at the 90% confidence level.
Note: Response categories under 5% in PY3 have been omitted.
Source: PY1, PY2, and PY3 CATI Participant Surveys

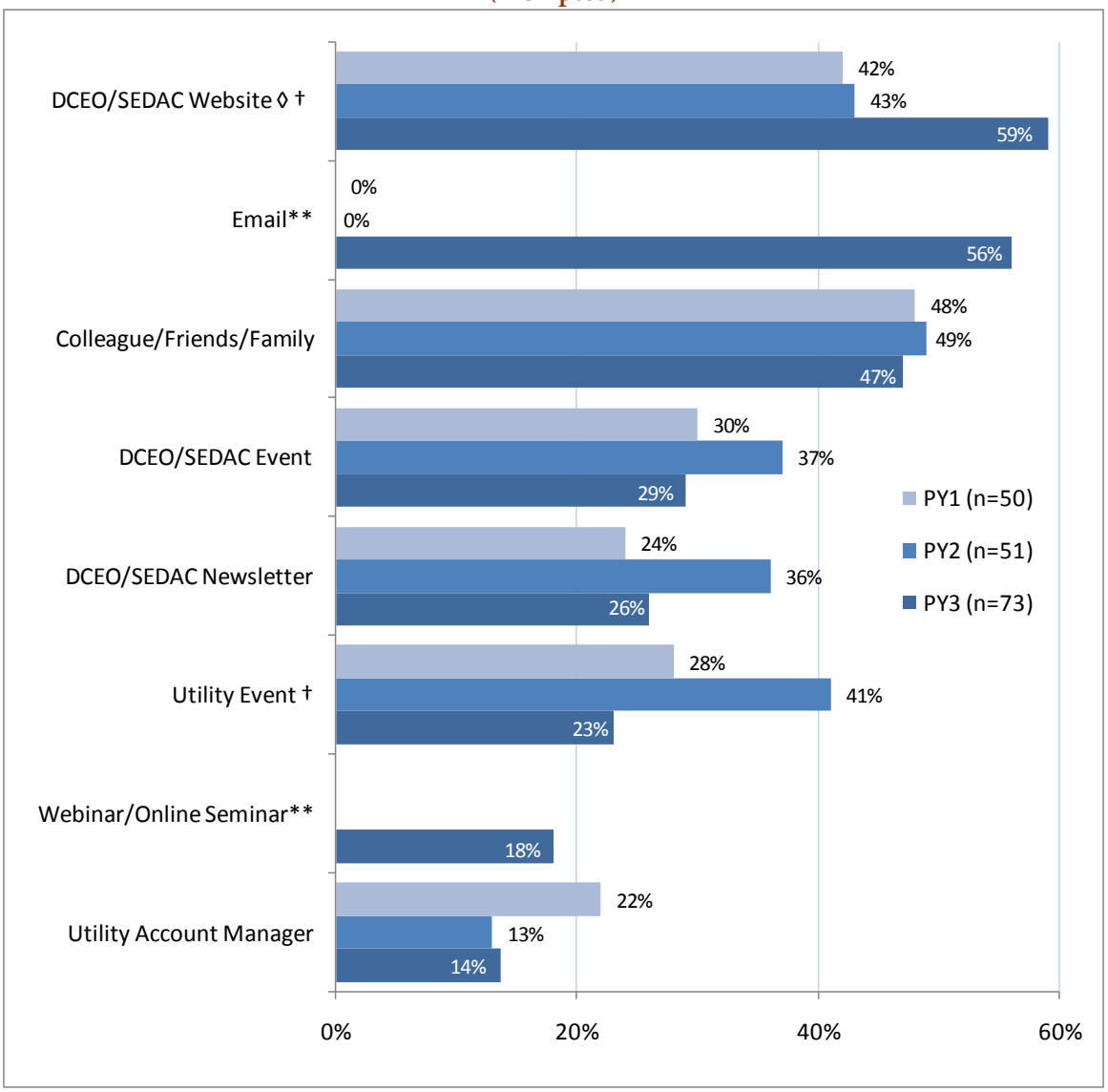
The survey also asked participants about various sources through which they might have obtained information about the program in the past. Key findings include:

- Electronic media are an important way of disseminating information about the PSEE Program. Over half of participants (59%) have visited DCEO or SEDAC's websites to learn about the program. This is a significant increase over previous years (43% in PY2 and 42% in PY1). Over half (56%) also received information about the program in an email.

- Word-of-mouth continues to be an important way of sharing information about the program. Nearly half of PY3 participants (47%) have heard about the program from colleagues, friends, or family.
- Participants in PY3 (23%) are less likely than those in PY2 (41%) to have heard about the program at an Ameren Illinois Utilities or ComEd event.

Figure 3-7 summarizes these responses.

Figure 3-7. Sources of Information about the Public Sector Electric Efficiency Program (Prompted)

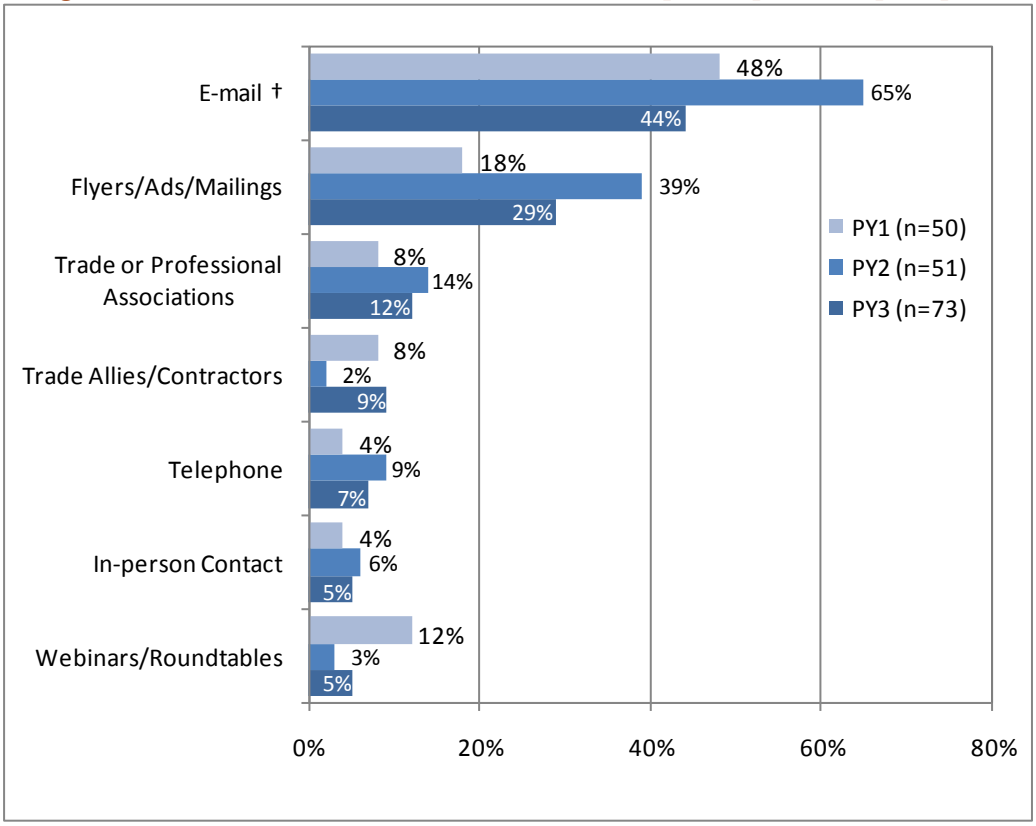


◊ Denotes a significant difference between PY3 and PY1 at the 90% confidence level.
† Denotes a significant difference between PY3 and PY2 at the 90% confidence level.
Source: PY1, PY2, and PY3 CATI Participant Surveys
***Channel not asked about in previous years.*

E-mail continues to be the best way of reaching public sector entities with information about energy efficiency programs (44%), but the share of participants who prefer this outreach channel has declined compared to PY2 (65%). Many customers also cite flyers and other mailings (29%) as a preferred method of providing information.

Figure 3-8 summarizes these findings.

Figure 3-8. Preferred Methods of Contact (Multiple Response, Unprompted)

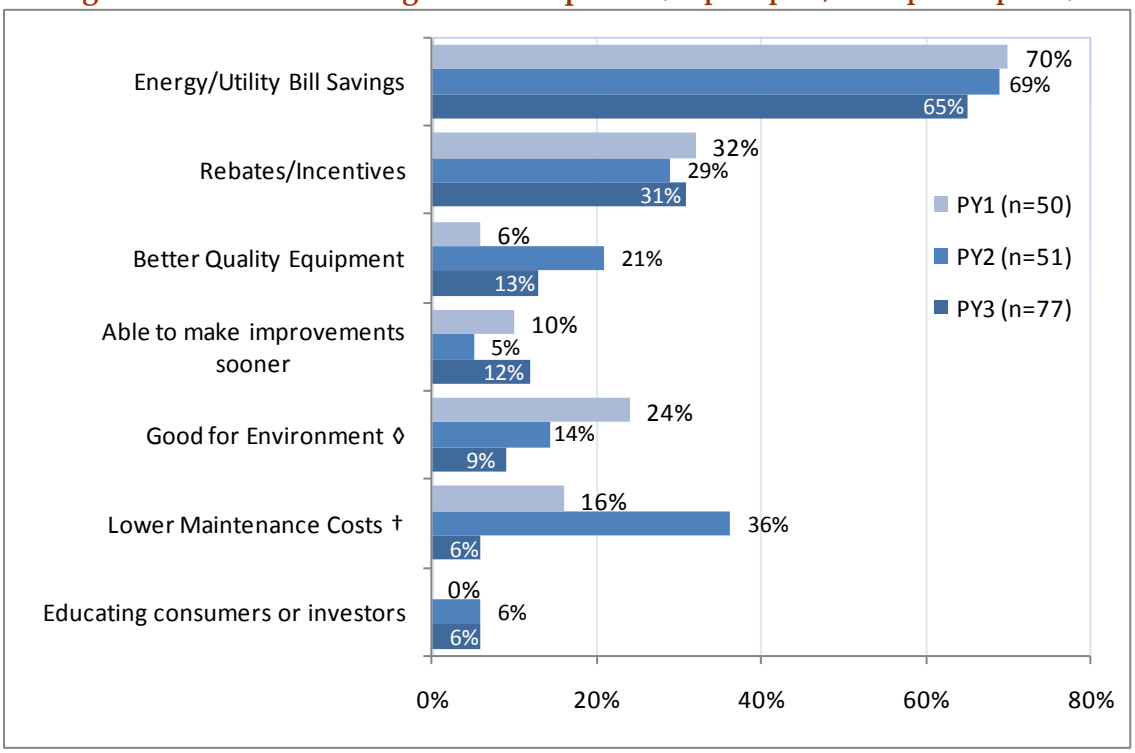


† Denotes a significant difference between PY3 and PY2 at the 90% confidence level.
Note: Response categories under 5% in PY3 have been omitted.
Source: PY1, PY2, and PY3 CATI Participant Surveys

Similar to previous years, participants consider energy and bill savings the major benefit of participating in the Standard Program (65%). Participants also commonly reference the importance of the rebates and incentives (31%), better quality equipment (13%), and the ability to make improvements sooner (12%). These benefits should be highlighted in marketing messages. Reducing maintenance costs is mentioned significantly less than in PY2 (6% vs. 36%).

Figure 3-9 summarizes participant responses about the benefits of program participation.

Figure 3-9. Benefits of Program Participation (Unprompted, Multiple Response)



◊ Denotes a significant difference between PY3 and PY1 at the 90% confidence level.
† Denotes a significant difference between PY3 and PY2 at the 90% confidence level.
Note: Response categories under 5% in PY3 have been omitted.
Source: PY1, PY2, and PY3 CATI Participant Surveys

3.2.6 Barriers to Participation

With increasing program goals, attracting new and repeat participants will become increasingly important in future years. As such, understanding why customers do not participate and what can be done to reduce their participation barriers is important. While this evaluation did not include research with non-participants, the evaluation did include several activities that explored barriers to participation (program staff interviews, interviews with customers who initiated the participation process but did not submit a final application, procurement process interviews, and the participant survey). Based on this research, key barriers to participation include:

- **Lack of program awareness:** In the participant surveys for all three program years, lack of program awareness was most often identified as a barrier to participation. In PY3, 55% of participants thought that this prevented other public sector entities from participating.
- **Budget constraints:** Lack of funding was identified as a barrier to the installation of energy efficient equipment, and thus participation in the PSEE Program, by participants

(30%) as well as program drop-outs and entities interviewed about the procurement process. As the contact for one entity that dropped out of the program in PY3 put it:

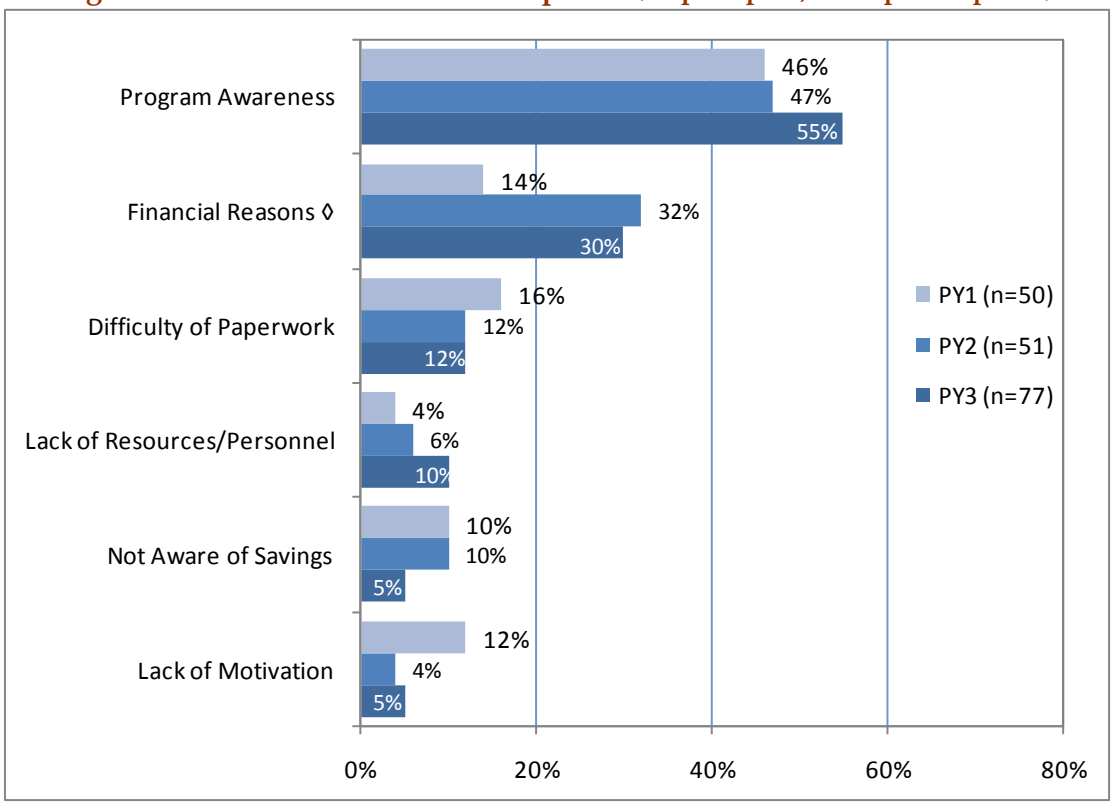
> *"As soon as funding is available I want to go ahead with [the project] because we saw such drastic decreases in our bills [after the first project we implemented] that it was well worth our effort to do it now. And I think as we go forward we're going to save even more money."*

- **Lack of human resources/technical expertise:** Lack of technical expertise, or in some cases just personnel to oversee the application process, further affects adoption of energy efficient technologies and participation in the PSEE Program. Program staff found that some of the smaller entities that came to the program through their EECBG funding simply did not have the resources to complete the application process (either personnel or physical office supplies).
- **Procurement process:** In the first program year, program staff identified the length and timing of the budget planning process as one of the major barriers to participation. Since public sector budgets are generally set far in advance, many customers did not have a chance to take advantage of the program in PY1 because the budgeting process for the year had already taken place. Research conducted for the PY3 evaluation confirm that the budgeting and procurement process is usually lengthy, often requiring multiple approvals and extensive project documentation, which can lead to delays in implementing projects and participation in programs like PSEE. Detailed findings from the procurement process research are presented in a later subsection.
- **Competing funds:** According to program staff, some projects dropped out of the program because the entity received direct stimulus grants from the federal government. These entities had started to work with DCEO but then dropped out when they learned that federal funding would cover 100% of the project cost.

Additional findings from our interviews with program drop-outs and entities interviewed about the procurement process are presented in the next two subsections.

Figure 3-10 summarizes responses to the question – "What do you think are the reasons organizations like yours do not participate in this program?" – from the PY3 participant survey, compared to PY1 and PY2.

Figure 3-10. Reasons for Non-Participation (Unprompted, Multiple Response)



◊ *Denotes a significant difference between PY3 and PY1 at the 90% confidence level.*
Note: Response categories 5% and under PY3 and "don't know" responses in PY3 are not included.
Source: PY1, PY2, and PY3 CATI Participant Surveys

3.2.7 Program Drop-outs

Understanding why applicants drop out of the program was a topic of interest to program staff in PY3. The evaluation team conducted interviews with 21 organizations that had filed a pre-approval application but did not submit a final application in PY3. Notably, 16 of these 21 organizations reported that they had already resubmitted their application for PY4 or were planning to do so. These individuals explained that their projects had been delayed due to difficulty obtaining funding and/or the timing of non-DCEO grants. According to program staff, EECBG funding could be used in either PY3 or PY4. Some applicants started the DCEO application process in PY3 but did not implement the project within the program year, causing them to "drop out."[20]

[20] It should be noted that in PY3, the program tracking database did not have the ability to reassign an applicant from PY3 into PY4. As such, the database identifies any project that started the application process in PY3 but was not completed as "cancelled."

Interestingly, some applicants dropped out of the PSEE Program *as a result* of receiving federal stimulus money. As explained above, these entities had started to work with DCEO but then dropped out when they learned that federal funding would cover 100% of the project cost. While some projects were lost this way, other recipients of direct stimulus grants expanded the scope of their original project, or implemented additional projects, to take advantage of the DCEO funding.

Of the five interviewed drop-outs who have not resubmitted their application in PY4 and do not intend to do so, two implemented their project without the DCEO incentive and three are not planning to complete the project:

- Of the two entities that implemented the project without the DCEO incentive, one did not submit the final application because of staffing changes and the resulting lack of a person responsible for finalizing the grant application. The other did not know how and where to submit the final application. However, both indicated that the availability of DCEO funding was very influential on the initial decision to implement the projects and that the projects would not have been of the same efficiency levels without the program's incentive opportunities and information. These two projects present a missed opportunity for the program, however, they do appear to be participant spillover.
- The other three drop-out applicants never completed the project and do not plan to do so in the near future. Reasons for not completing the projects include project costs, an inability to secure supplemental funding, and structural limitations that prevented equipment installation. None of these respondents had any suggestions for ways DCEO could have helped them to complete those projects as payback and upfront costs are their organizations' primary considerations when investing in energy efficiency.

Overall, applicants like these five drop-outs present an opportunity for DCEO in the future. Most cite budget shortages and overall lack of funding as the core barriers to adoption of energy efficient equipment. However, all rate their facilities as either somewhat energy efficient or not very energy efficient, and nearly all plan to make additional improvements and are likely to consider energy efficient options. In addition, two drop-outs pointed to lack of technical expertise as a barrier to energy efficiency, and all five respondents rated themselves as being only somewhat knowledgeable about energy efficiency. Following up with these applicants, informing them about PSEE opportunities, and offering additional technical assistance and support might result in additional projects in the future.

3.2.8 Public Sector Equipment Procurement Process

The equipment procurement process of public organizations is fundamentally different from that of private ones, and it can present a challenge with respect to participation in energy efficiency programs. To further examine this process, and how the PSEE Program might help potential participants overcome the challenges associated with it, the evaluation team

conducted in-depth interviews with public sector personnel involved in the equipment procurement process. We interviewed ten entities who participated in PY3. These entities represent a range of public sectors including local governments (6), K-12 schools (3), and federal government entities (1).

Project Funding

Public sector entities use a variety of funding sources to pay for equipment replacement projects. For the majority of interviewed entities, capital improvements are budgeted for as part of the facility maintenance funds or general building operating expenses, which are then rolled into overall school, county, or other budgets. In addition, some entities utilize life safety funds, bonding issue, or additional taxes for capital improvements. These funding sources are frequently supplemented with available grant opportunities, such as the PSEE Program.

Based on the interviews we conducted, there do not appear to be any caps or limitations for the costs of equipment upgrade projects.

Documentation required to reserve funding varies from general cost assumptions to detailed project specifications with ROI and payback calculations and a rationale for undertaking the project.

Budget Planning

Since capital improvements are often part of a school or county budgets, planning such improvements often goes hand-in-hand with the fiscal year planning process deadlines. All counties in Illinois have a fiscal year of December 1st through November 30th; planning for the year's budget starts in August. Fiscal years for other public sector entities vary. Notably, three of the ten interviewed entities mentioned having long-ranging capital improvement plans (three- and five-year plans) for larger equipment replacement projects. These plans outline priorities for the upcoming years; they are then further revised, specified, and incorporated into annual budgets.

A respondent from a local government entity explained that incorporating unforeseen projects into long-ranging plans is possible, yet onerous:

> *"You can submit a request [to amend long-ranging plans], which I had to do for next year's budget, but […] you have to go through the process and put everything together and justify why you want to do what you want to do."*

Timing of Project Implementation

No single time of year appears to be ideal for project implementation. For example, all K-12 school representatives name summer as the best time for all equipment upgrade projects; one local government facility prefers to implement the projects in the fall, while another one says that spring is the best time. The remaining five respondents do not have a preference or say that the timing is equipment-specific.

Project Approval Process

Project approval steps vary among interviewed entities but generally include the following three common steps:

- **Cost estimates and project specifications:** This step can be performed by an in-house staff or outside engineering professional, sometimes with contribution from internal maintenance staff, the department of public works, or other individuals or entities.
- **Bidding process and winning bid selection:** This step generally includes issuing request for bids or proposals, an internal review of bids once they are submitted, and development of recommendations on the winning bidder.
- **Project approval:** depending on the entity, this step usually includes voting by the board of trustees, board of education, county board, or city council.

Interestingly, the order of the above mentioned steps varies. Within some interviewed public sector entities, the board approves project specifications and budgets before requests for bids are issued, while within others, the board approves the project after the bids are fielded. In cases where project specs do not undergo the board or council approval prior to issuing request for bids, individuals such as city managers, department heads, internal maintenance staff, or engineers review the accuracy of the project scope and pricing. In cases where bids are not reviewed or approved by the board or council, this step is performed by engineers or central purchasing department.

Within one local government entity, board approval is required both before the bid is issued and for the final selection of the winning bidder. One federal government entity requires several levels of project approval:

> *"Well [there are] many steps. It's got to go to the director of property management. Then it goes to asset management, and then above that it goes to executive director of office properties, and then after that it's got to […] be approved by ownership."*

The duration of the project approval process among interviewed entities ranges from four to six months.

Bidding Process

All of the interviewed entities have project cost thresholds that require a formal bidding process, with $20,000 being the most frequently cited cut-off amount below which the projects can be approved internally and procured directly without a need for an official bid request or board or council approval/voting. However, most of the interviewed public sector entities issue an informal request for bids regardless of the project costs, with the goal of ensuring competitive project pricing. Furthermore, a few respondents mentioned that they inform their board of the project or project-related decisions, even when board approval is not required. This is done in order to keep all the parties informed and maintain a good working relationship.

When it comes to awarding the bids, most of the public sector entities have either a requirement or a recommendation to award the project to the lowest qualified bidder. According to one respondent, proving that quality should come before cost presents its own hurdle:

> *"We have to take the lowest responsible bidder but at times […] we can demonstrate why the low bid is not the one to go with. If we have some valid reasons for rejecting their bid – […] if we get a bad reference or we hear that they didn't complete the project on time – but you do have to validate that in writing. You can't just decide arbitrarily to not take the lowest bid; you have to have some pretty good rationale for not accepting it."*

Within one local government entity, there are ordinances in place that recommend selection of a local contractor. Most other interviewed public sector entities, however, do not have a requirement to give preference to a specific contractor type (e.g., local, women-run, etc.). A few respondents however, noted that in case of competitive bids, they give preference to local contractors. The tendency to select the lowest bidder does not present a barrier to energy efficiency, as project specifications are tightly formulated and outlined to bidding contractors at this stage in the process.

Role of Energy Efficiency

The importance of energy efficiency varies across the interviewed public sector entities. While not a formal requirement for any of the interviewed entities, three out of ten respondents said that energy efficiency is a top priority, two more said it is one of the main factors (along with cost), and one respondent said that energy efficiency is of greater importance for certain equipment options (such as motors).

Procurement Process Challenges

Procurement process challenges mentioned by respondents include difficulty obtaining funding and developing project scope. Few of the interviewed entities have difficulty securing contractors to perform the work. One respondent, however, noted that while it is fairly easy to secure contractors for more common types of projects (such as lighting or HVAC projects), finding qualified contractors for specialized projects (such as water treatment or sewer plant retrofits) can present a challenge. Another respondent found that lack of internal technical expertise, when defining project scope and specifying equipment characteristics, is a challenge. This might present an area where DCEO can provide additional assistance to its customers. A DCEO specific trade ally network, planned for PY4, might help connect public sector entities to specialized contractors. Through SEDAC, additional technical assistance and support is available to customers who lack such resources.

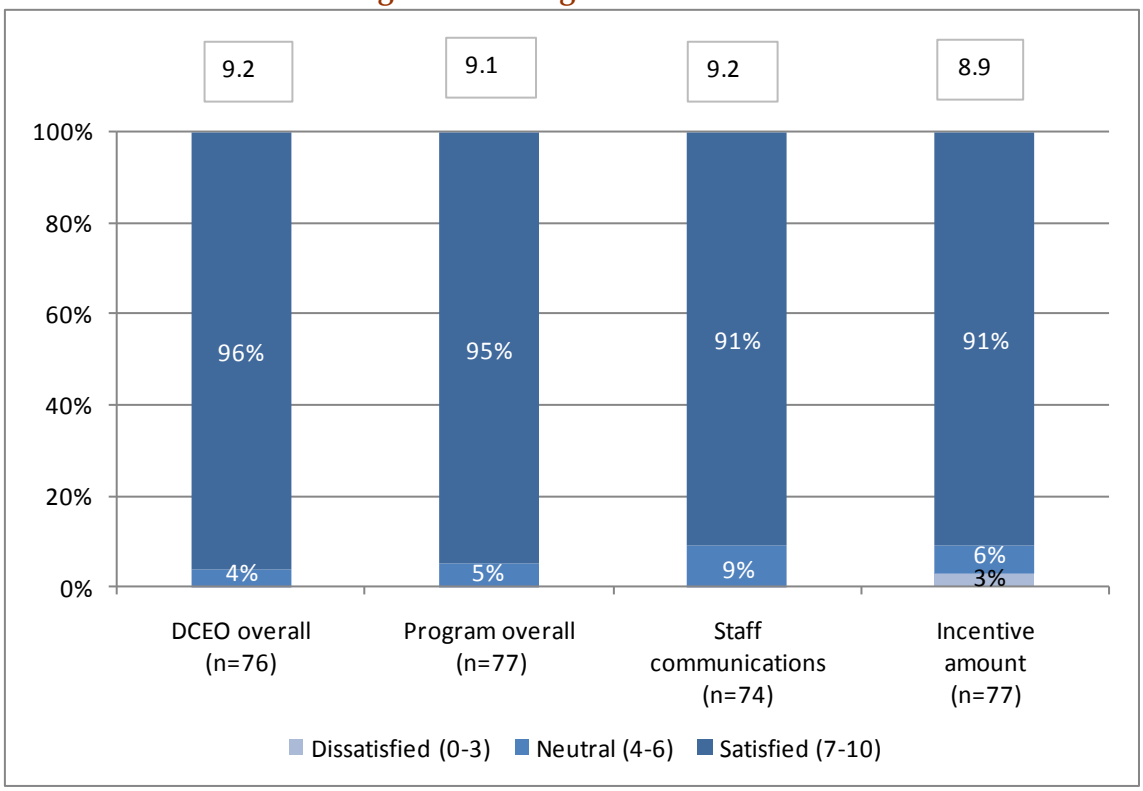
3.2.9 Participant Satisfaction

Participants are very satisfied with the Standard Program. Participants were asked to rate – on a scale of 0 to 10, where 0 means "very dissatisfied" and 10 means "very satisfied" – four aspects of the program: DCEO overall, the program overall, staff communications, and the incentive level. More than 90% of participants are satisfied with all four of these program aspects.[21] Figure 3-11 summarizes these results.

In addition, all participants interviewed about their procurement processes are very satisfied with their participation process and their interactions with DCEO.

[21] A rating of 7 to 10.

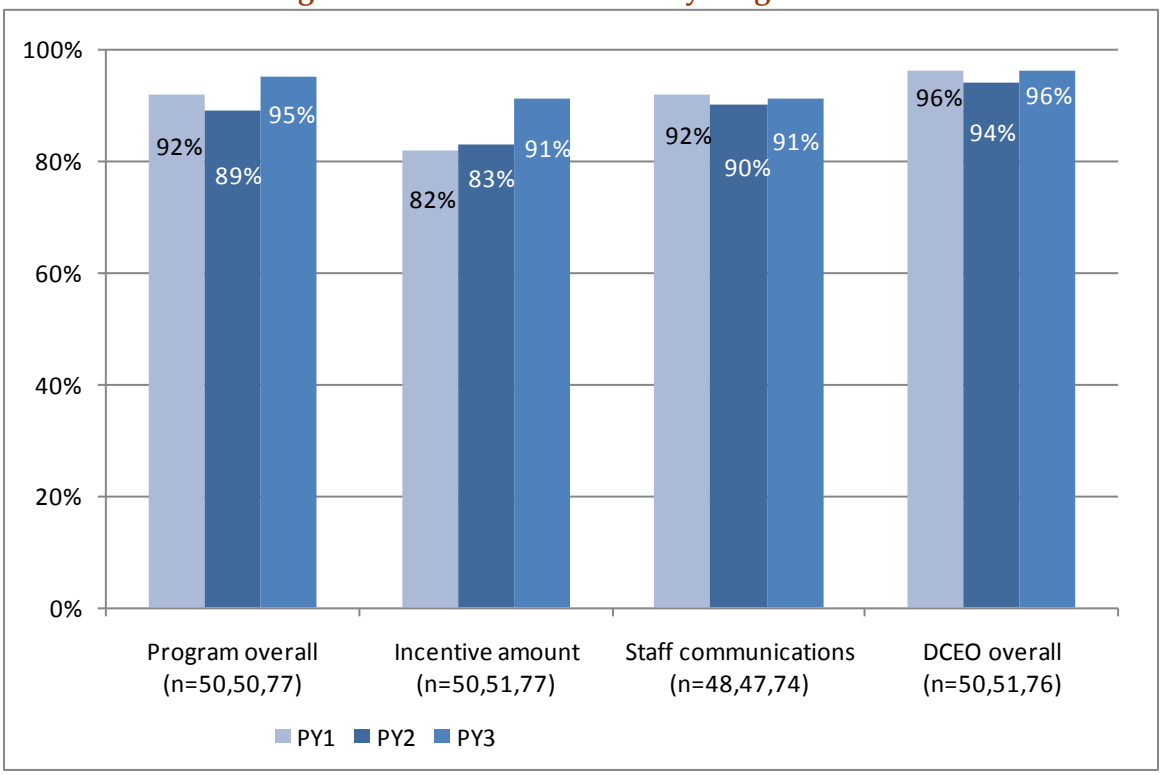
Figure 3-11. Program Satisfaction



Source: PY3 CATI Participant Survey

Satisfaction with the program and its elements in PY3 is largely unchanged from previous years. Satisfaction with the incentive amount is higher in PY3 compared to PY1 and PY2 (statistically significant difference in mean rating), reflecting the increasing incentive levels since PY1. Figure 3-12 summarizes satisfaction levels in the three program years.

Figure 3-12. Percent Satisfied by Program Year



Source: PY1, PY2, and PY3 CATI Participant Surveys

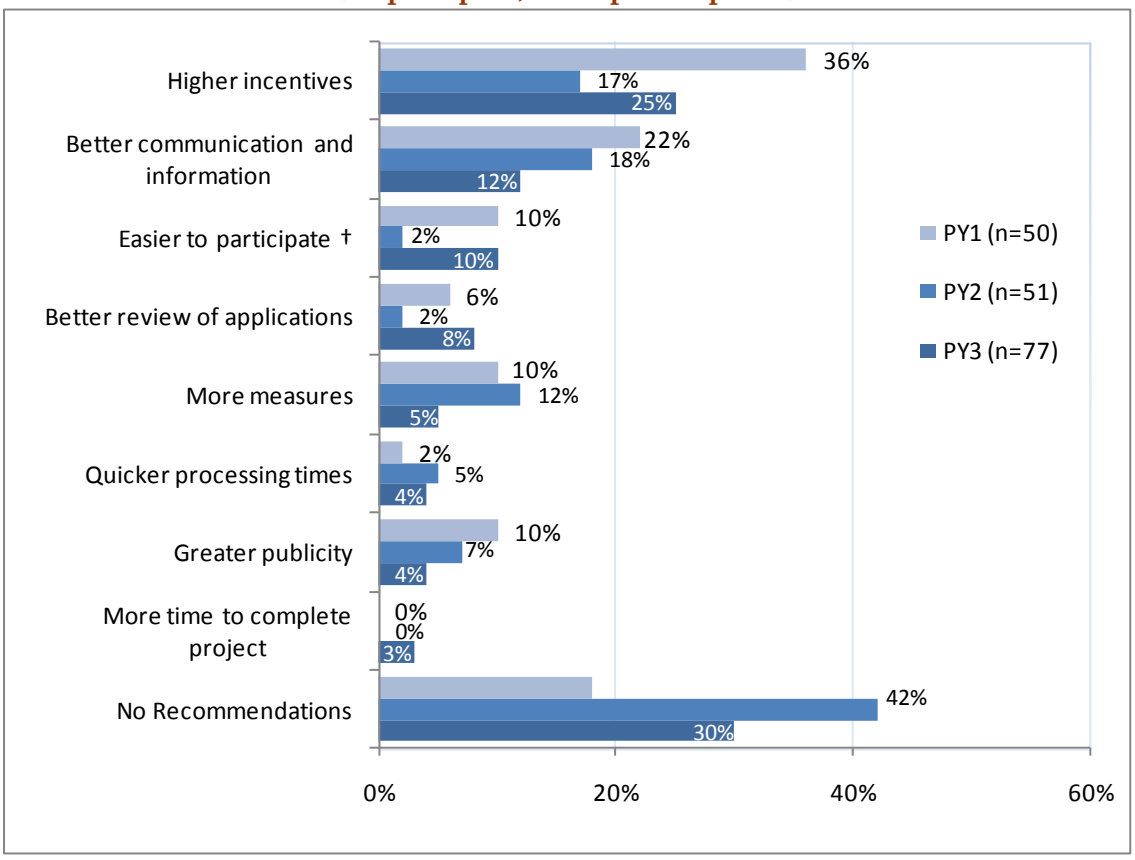
Given the high levels of satisfaction, it is not surprising that most participants plan to participate again in the future (83% say yes, 10% say maybe).

When asked what could be done to improve the program, 30% have no recommendations. Despite increased incentive levels in PY2 and PY3 and the increase in satisfaction with incentives amounts noted above, the most common recommendation is to increase incentives (25%). Other recommendations include better communication and information (12%), making it easier to participate (10%), and better review of applications.

Participants interviewed about their procurement processes suggest that the program increase marketing and outreach efforts and simplify the applications process.

Figure 3-13 summarizes recommendations provided by PY3 participants, compared to PY1 and PY2.

Figure 3-13. Recommended Program Improvements by Program Year (Unprompted, Multiple Response)



† Denotes a significant difference between PY3 and PY2 at the 90% confidence level.
Response categories under 3% in PY3 have been excluded.
Source: PY1, PY2, and PY3 CATI Participant Surveys

3.3 Cost Effectiveness Review

[To be added after impact results are finalized.]

Section 4. Conclusions and Recommendations

This section highlights the conclusions and recommendations from the PY3 evaluation of DCEO's Standard Program. The primary evaluation objectives include quantifying the gross and net energy and demand impacts resulting from the rebated measures and assessing program marketing and delivery. Below are the key conclusions and recommendations.

4.1 Key Impact Conclusions and Recommendations

In conducting the PY3 Standard program impact evaluation, the evaluation team has drawn a number of conclusions and recommendations that are presented in this section.

Overall Findings

The PY3 Standard evaluation found that verified gross energy savings were 9 percent higher than savings in DCEO's tracking system, as indicated by the realization rate (realization rate = verified gross / tracking system gross). The PY3 realization rate of 1.09 compares with an estimated value of 1.27 in PY2. The verified net-to-gross ratio (NTGR) of 0.66 estimated for PY3 compares with a value of 0.75 estimated in PY2.

The relative precision at a 90% confidence level for the Standard projects in the sample is ± 7% for the kWh realization rate. The relative precision at a 90% confidence level for the program NTG ratio is ± 7%. In PY3, on-site verification covered 88% of the energy savings in our sample.

The primary factor that raised the Standard energy realization to 1.09 was a common finding, through on-site verification and telephone interviews, of longer hours of use than assumed in the default savings. Factors that tended to lower realization rates on individual projects were adjustments to quantities installed, and adjustments to savings based on installed and baseline equipment performance relative to default assumptions. Findings of lower hours of use than default values lowered the realization rates on some projects. A large proportion of PY3 program savings was for traffic signal projects, including 36% of overall program savings with the City of Chicago, and these projects were not subject to hours of use adjustments.

Comparing PY2 and PY3, the mean NTG ratio decreased from PY2 (0.75) to PY3 (0.66). Although the PY3 results experienced a large increase in the number of smaller projects, these did not have a dramatic impact on the NTG ratio relative to PY2. The primary difference between PY2 and PY3 was that larger PY3 projects had substantially lower NTG ratios than in PY2: for stratum 1, PY3 had a NTG ratio of 0.60 versus 0.70 for PY2, and for stratum 2, PY3 had a NTG ratio of 0.60 versus 0.80 for PY2. In PY3, some large projects had quite low NTG ratios, and a substantial fraction had results in the 0.60 to 0.65 range. Non-programmatic influences identified by respondents with lower NTG scores on these projects were public safety issues and policy requirements.

The mean NTG ratio for the group of respondents who reported receiving funding from other public sources (ARRA, EECBG, ISBE, and Illinois Clean Energy Grants), weighted by ex ante kWh, was 0.67. For the group of Standard program NTG interviewees that did not mention one of the four other funding sources, the kWh weighted NTG ratio was 0.59. Although we did not generate a precision estimate for these subgroup estimates, it does not appear that receipt of other public funds was on average resulting in a NTG ratio that was lower than the mean value for the overall program.

In PY2, the evidence for spillover was limited and therefore an enhanced effort to estimate it was not included in the PY3 evaluation plan. Although the evidence for participant spillover is limited again in PY3, the DCEO Standard program has reached a size (53.6 million kWh, 449 projects) where it would be worthwhile to attempt to quantify a small percentage spillover in PY4. Therefore, the Standard evaluation team will be conducting an enhanced effort to identify potential spillover candidates and quantify spillover in PY4.

Specific Recommendations and Conclusions

- **DCEO should consider strategies to increase participation of smaller projects.** Projects in the small-size stratum, with savings under 200,000 kWh, had higher gross realization rates and net-to-gross ratios than larger projects, on average.

- **DCEO should continue strategies to increase participation of fluorescent lighting projects tied to pending Federal fluorescent lighting standards.** Open-ended interview responses indicated a concern for the future availability of T12 and standard T8 lamps and this was a motivating factor in some projects. This is an important topic to address in ongoing marketing and outreach efforts.

- **During PY4, DCEO should consider working with the evaluation team to ensure that statewide technical reference manual development provides additional building types or modifications to existing building types that would be beneficial for reporting energy savings.** Although the current set of building types work reasonably well, they were developed by ComEd for commercial businesses and not specifically designed for public building types. After three years of Standard program operation and evaluation cycles, plus work conducted by SEDAC, a substantial set of site collected data is available. The evaluation team has compiled observations from field verification and telephone survey work and can provide additional analysis.

- **During PY4, prior to closing out year-end ex ante savings estimates, DCEO should consider working with the evaluation team to review default values and ex ante savings calculation outputs to ensure that tracking system output matches values expected by the evaluators.** The evaluation team can review default lookup values coded into the tracking system and check the values against the default values

documentation, and advise DCEO on any differences. The evaluation team could also review the output of ex ante calculations as ongoing changes are made in the tracking system.

- **DCEO should consider working with the evaluation team to facilitate evaluation analysis and reporting of measure-level impact results.** The tracking system stores project data at the measure level, however, the evaluation team was not able to produce measure level impacts from tracking data extracts provided by DCEO for the PY3 evaluation. If the evaluation team could extract measure-level savings information it would facilitate savings verification analysis and allow the evaluation team to provide greater detail to reporting.

- **DCEO should consider additional quality assurance and quality control steps to verify the unit basis and quantities entered into the tracking system.** As a general qualitative finding, DCEO was quite accurate on measure quantities claimed, with a common finding being exact or within one or two percent on sampled projects. This is commendable given that some Standard projects have quantity counts that number in the hundreds and thousands. There were instances where projects had recorded the wrong units when recording savings, either recording lamps when the correct unit was an entire fixture, or recording a fixture count when the unit required was lamps. The new tracking system may allow for enhanced checking or alerts regarding individual measure entries.

- **DCEO should consider additional quality assurance and quality control steps to verify the eligibility requirements on measure types with complex requirements.** As a general qualitative finding, equipment was eligible for the measure assigned. Within our sample there was an instance of a high performance T8 lamp and ballast installation not meeting the baseline and ballast requirements, and a project with HVAC measures that did not qualify. The new tracking system may allow for enhanced checking, flags, or alerts regarding individual measure entries.

4.2 Key Process Conclusions and Recommendations

Program Participation

Finding. The Standard Program experienced strong growth in PY3. Ex ante energy savings (75%) as well as the number of projects (57%) and participants (35%) all increased substantially from PY2 levels. Local governments represented the largest share of projects, participants, and energy savings. The average project size increased somewhat (11%), largely driven by increases in the size of projects implemented by universities and local governments. However, while university and Federal government projects tend to be larger than projects implemented by other sectors, the number of university projects decreased from 20 in PY2 to eight in PY3

(although PY3 savings was higher than PY2), and the number of Federal government projects was unchanged (seven each in PY2 and PY3, but the total savings was lower in PY3).

- **Recommendation:** DCEO should consider special offerings for sectors with limited participation but high savings potential. Hard-to-engage sectors with high savings potential might benefit from specific offerings to encourage more participation. This could include limited-time offerings or a bonus incentive for projects exceeding a certain size. The increase in incentive levels for non-carve out entities (universities and State and Federal governments) in PY4 should help in increasing participation among these sectors.

Program Design and Implementation

Finding. Despite an increase in the incentive cap from $200,000 to $300,000, 26% of surveyed Standard Program participants noted that the scope of their project was limited by the incentive cap.

- **Recommendation:** DCEO should consider allowing more flexibility in removing or increasing the incentive cap. This may help in bringing in larger Standard projects and meeting increasing savings goals. We note that larger projects did tend to have higher free-ridership scores.

Finding. The development of a program tracking database was a key activity in PY3. The new database system was intended to reduce administrative burden and allow multiple staff to enter data into the database at the same time. While the new database has helped with tracking projects, program staff point out that entering all project related data into the system is more time consuming than the previous system (because more information is captured) and that many report automation capabilities that would be useful in conducting their work were not yet available in PY3.

- **Recommendation:** Continue the development of database functionalities to make it a more useful program management tool. While the database has allowed staff to be more efficient in a number of ways, it is not yet developed and used to its fullest potential as a management tool. The program should continue to make database improvements and provide ongoing user training to program staff and any partners who might use it in the future. DCEO has noted that they have recently provided training to SEDAC, the Energy Resources Center and several other partners on use of the DCEO database. Partners that administer programs on their behalf or conduct site visits are using the DCEO database in PY4.

Finding. The program's lighting special – where incentives for certain lighting measures were increased by 20-50% – was popular among program participants, with 29% of Standard Program projects taking advantage of this offering. Lighting special participants are more

satisfied than others with the incentive amount, but also with DCEO overall, the program overall, and communication with DCEO staff. However, more than half of those who were aware of the increased incentive (52%) say they would have been likely to install exactly the same equipment with the regular incentive.[22] Given these responses, it is unclear how effective the bonus incentive was in attracting new projects.

- **DCEO should consider multiple implications when designing any future special promotions.** While special promotions have been well subscribed in both PY2 and PY3, care should be taken with the assumption that increased incentive amounts actually increase participation, and do not simply shift project implementation into the bonus period. Focusing promotions on sectors with limited participation or measures with limited uptake might be one way to increase participation, leverage untapped opportunities, and reduce the possibility of free ridership.

Program Partnerships

Finding. In PY3, DCEO has continued to leverage partnerships with organizations such as the Illinois Association of Regional Councils and the Illinois State Board of Education. These partnerships have been successful in increasing participation by local governments and K-12 schools. Cooperation included shared marketing and outreach efforts and channeling participants into each others' programs.

- **Recommendation.** DCEO should be aware that participation by projects that also receive significant funding from other public sources has the potential to result in higher free-ridership in the DCEO program. Although the savings weighted-average free-ridership on co-funded projects in PY3 was not higher than the mean value for the overall program, co-funding has the potential to increase DCEO free-ridership scores if participants assign relatively more influence to the other co-funding sources.

Trade Allies

Finding. In PY3, DCEO continued to make use of the utilities' and SEDAC's existing trade ally networks, but made an attempt at developing its own network of contractors through an Application Assistance Providers pilot effort under the Building Industry and Training Education Program (BITE). Program staff did not find this pilot effort to be a productive use of program resources. In PY4, DCEO plans to build a trade ally network similar to that of the utilities, where trade allies are enticed to participate by being eligible for incentives themselves. Participant survey results confirm the importance of trade allies in channeling participants into

[22] "Likely" is defined as a score of 7 to 10 on a scale from 0 to 10, where 0 is "not at all likely" and 10 is "extremely likely."

the program, assisting them with the design of their projects, and supporting them through the application process.

- **Recommendation.** Development of a program-specific trade ally network is well-warranted. Based on our procurement process interviews, trade allies are often involved at the project specifications stage and then again at the implementation stage. While trade allies have influence over the energy efficiency of equipment at the former stage, they rarely do at the latter stage since project details have already been determined. It is therefore important that DCEO's network include trade allies capable of helping at the project design stage, so that they have an opportunity to promote energy efficiency and participation in the PSEE program to public sector entities. DCEO reports that activity on this recommendation is underway, with the Energy Resources Center and SEDAC developing a trade ally program for DCEO.

Finding. Lack of technical expertise is a key challenge in the equipment procurement process. Drop-outs also point to lack of technical expertise as a barrier to energy efficiency and rated themselves as being only somewhat knowledgeable about energy efficiency.

- **Recommendation.** DCEO should consider providing additional resources to help potential applicants connect with technical expertise. While SEDAC already provides technical assistance, a program-specific trade ally network should help connect applicants with qualified technical support. Outreach materials should emphasize these resources.

Finding. Lighting special participants are significantly more likely to have heard about the PSEE program through a contractor or trade ally compared to participants who did not participate in the promotion. This suggests that this special offering might have induced trade allies to more actively market the program.

- **Recommendation.** In future promotions the program should continue to leverage trade ally involvement as a key channel to inform participants.

Marketing and Outreach

Finding. In PY3, the PSEE Program was re-branded as *Illinois Energy Now* (IEN). DCEO conducted marketing and outreach efforts through various means, including electronic media as well as in-person events and presentations. Electronic media have been successful in disseminating information about the program: 56% of participants have received an e-mail with information about the program, 26% have heard about the program in the DCEO/SEDAC e-newsletter, 59% have seen program information on the DCEO or SEDAC website, and 18% have attended an on-line seminar/webinar. E-mail continues to be the best way of reaching public sector entities with information about energy efficiency programs (44%). Print materials also appear to be an important channel for reaching participants. The largest share of participants

learned of the program through print materials (publications, flyers, and newsletters), and the second most preferred method of receiving information is through flyers and other mailings.

Finding. Budget constraints are a key barrier to the installation of energy efficient equipment and participation in the program. The program developed some marketing materials in PY2, but no new collateral was developed in PY3. Currently few materials highlight how energy efficient equipment can help budgets in the long run, and there are no materials specific to the various public sectors.

- **Recommendation.** While the increased PY4 incentive level will help reduce financial barriers for non-carve out sectors, the upfront cost of energy efficient equipment is likely to remain a barrier to participation for many public sector entities. However, this barrier might be reduced if prospective participants had more collateral that demonstrates the savings that can be expected from the installation of energy efficient equipment. The program should consider developing short sector-specific case studies or fact sheets that provide examples of potential savings. This might be a useful tool for facility managers when seeking approval for energy efficiency upgrades.

Program Drop-outs

Finding. Our interviews with contacts for projects that have been identified as cancelled in the program tracking database showed that 16 of 21 projects had not been cancelled but simply postponed. In PY3, the program tracking database did not have the ability to reassign an applicant from PY3 into PY4. As such, the database identifies any project that started the application process in PY3 but did not complete it as "cancelled."

- **Recommendation.** Incorporate a procedure for assigning or modifying a "Program Year" field into the database so that projects can be seamlessly moved from one program year to the next.

Finding. Two of the five interviewed program drop-outs completed their projects outside of the program. These entities did not submit a final application because they were unclear on how and where to do so.

- **Recommendation.** DCEO should continue requesting periodic status updates from applicants. Requesting status updates throughout the year will allow program staff to remain connected with applicants and potentially help them by suggesting resources or clarifying points of confusion. DCEO reports that using the email addresses in the database, they did two mass mailings in 2011, in February and April, to all grantees that had not completed their projects to determine their status and remind them of deadlines.

Finding. Nearly all interviewed program drop-outs plan to make additional improvements to their facilities and say they are likely to consider energy efficient options.

- **Recommendation. DCEO should consider enacting a follow up process with program drop-outs in the future if the number drop outs increases.** At this time, there are very few drop-outs that do not re-apply the following year. If drop-outs increase, following up with these applicants and informing them about PSEE opportunities might result in additional project applications.

Participant Satisfaction

Finding. Participants are very satisfied with the Standard Program: More than 90% of participants are satisfied with DCEO overall, the program overall, staff communications, and the incentive level. Satisfaction with the incentive amount is higher in PY3 compared to PY1, reflecting the increasing incentive levels since program inception.

NAVIGANT

Section 5. Appendices

5.1 *Data Collection Instruments*

5.1.1 Participant Telephone Survey

DCEO PY3 PSEE
Participant Survey 20

5.1.2 Trade Ally and Contractor Free-ridership Survey Module

DCEO Standard PY3
Trade Ally Freeriders

5.1.3 Procurement Process Telephone Survey

DCEO PY3 PSEE
Equipment Procureme

5.1.4 Program Drop-out Telephone Survey

DCEO PY3 PSEE
Dropout Guide 20110

5.2 *Utility Specific Impacts*

Utility-specific energy impacts are provided below. The energy realization rate and net-to-gross ratio were developed based on a statewide sampling methodology and are applied to the ex ante savings reported for participants served by ComEd and those served by Ameren Illinois.

Table 5-1. Utility Specific Evaluation-Adjusted Net kWh Impacts for the PY3 Standard Program

Utility	Ex Ante Gross kWh	Ex Post Gross kWh	kWh RR	Ex Post Net kWh	NTGR (ex post gross)
Ameren	12,932,568	14,064,435	1.09	9,219,790	0.66
ComEd	40,702,174	44,264,454	1.09	29,017,090	0.66
Total	53,634,742	58,328,889	1.09	38,236,880	0.66

Source: Analysis of tracking savings from DCEO tracking system, September 7, 2011. The values displayed for RR and NTGR are rounded.

5.3 *Methodologies and Sampling*

5.3.1 Impact Evaluation Methods

Gross Program Savings

The objective of this element of the impact evaluation is to verify the veracity and accuracy of the PY3 ex ante gross savings estimates in the Standard program tracking system. The savings reported in DCEO's tracking system were evaluated using the following steps:

1. Engineering review at the measure-level for a sample of 52 project files, with the following subcomponents:
    a. Engineering review and analysis of measure savings based on project documentation, default assumptions, and tracking data.
    b. Review and application (if appropriate) of participant telephone survey impact data (reported hours of use) to projects in the engineering review sample.
    c. On-site verification audits at 25 project sites selected from the sample of 52 projects. Performance measurements included spot measurements and run-time hour data logging for selected measures. On-site data collection was conducted in the July through September period.
    d. Calculation of a verified gross savings value (kWh) for each project within the sample, based on measure-level engineering analysis.
2. Carry out a quality control review of the ex post impact estimates and the associated draft site reports and implement any necessary revisions.

A verified gross realization rate (which is the ratio of the ex post gross savings-to-reported tracking savings) was then estimated for the sample, by sampling stratum, and applied to the population of reported tracking savings, using sampling-based approaches. The result is an ex post estimate of gross savings for the Standard program.

Engineering Review of Project Files

For each selected project, an in-depth application review is performed to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. For each measure in the sampled project, engineers estimated ex post gross savings based on their review of documentation, consideration of CATI interview responses, and engineering analysis.

To support this review, DCEO provided project documentation that included some or all of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports (when available), post inspection reports (when conducted), calculation spreadsheets, and important email and memoranda. Where projects covered by the participant telephone survey overlapped with the

engineering review sample, relevant impact data from the telephone interview (reported hours of use) was applied to projects.

On-Site Data Collection

On-site surveys were completed for a subset of 25 of the 52 customer applications sampled. For most projects on-site sources include interviews that are completed at the time of the on-site, visual inspection of the systems and equipment, EMS data downloads, spot measurements, and short-term monitoring (e.g., less than four weeks).

An analysis plan is developed for each project selected for on-site data collection. Each plan explains the general gross impact approach used (including monitoring plans), provides an analysis of the current inputs (based on the application and other available sources at that time), and identifies sources that will be used to verify data or obtain newly identified inputs for the ex post gross impact approach.

The engineer assigned to each project first calls to set up an appointment with the customer. During the on-site audit, data identified in the analysis plan is collected, including monitoring records (such as instantaneous spot watt measurements for relevant equipment, measured temperatures, data from equipment logs and EMS/SCADA system downloads), equipment nameplate data, system operation sequences and operating schedules, and, of course, a careful description of site conditions that might contribute to baseline selection.

All engineers who conduct audits are trained and experienced in completing inspections for related types of projects. Each carries properly calibrated equipment required to conduct the planned activities. They check in with the site contact upon arrival at the building, and check out with that same site contact, or a designated alternate, on departure. The on-site audit consists of a combination of interviewing and taking measurements. During the interview, the engineer meets with a building representative who is knowledgeable about the facility's equipment and operation, and asks a series of questions regarding operating schedules, location of equipment, and equipment operating practices. Following this interview, the engineer makes a series of detailed observations and measurements of the building and equipment. All information is recorded and checked for completeness before leaving the site.

Conduct Site-Specific Impact Calculations and Prepare Site Reports

After all of the field data is collected, including any monitoring data, annual energy and demand impacts are developed based on the on-site data, monitoring data, application information, and, in some cases, billing or interval data. Each program engineering analysis is based on calibrated engineering models that make use of hard copy application review and on-site gathered information surrounding the equipment installed through the program (and the operation of those systems).

Energy and demand savings calculations are accomplished using methods that include short-term monitoring-based assessments, simulation modeling (e.g., DOE-2), bin models, application of ASHRAE methods and algorithms, analysis of pre- and post-installation billing and interval data, and other specialized algorithms and models.

For this study, peak hours are defined as non-holiday weekdays between 1:00 PM and 5:00 PM Central Prevailing Time (CPT) from June 1 to August 31. This is in accordance with the PJM manual 18, *Energy Efficiency and Verification*, of March 1, 2010.

Peak demand savings for both baseline and post retrofit conditions are the average demand kW savings for the 1 pm to 5 pm weekday time period. If this energy savings measure is determined to have weather dependency then the peak kW savings are based on the zonal weighted temperature humidity index (WTHI) standard posted by PJM. The zonal WTHI is the mean of the zonal WTHI values on the days in which PJM peak load occurred in the past ten years. This mean WTHI value is 80.4. Demand savings is the difference in kW between the baseline and post retrofit conditions.

After completion of the engineering analysis, a site-specific draft impact evaluation report is prepared that summarizes the M&V plan, the data collected at the site, and all of the calculations and parameters used to estimate savings. Each draft site report underwent senior engineer review and comment, providing feedback to each assigned engineer for revisions or other improvements. Each assigned engineer then revised the draft reports as necessary to produce the final site reports.

Net Program Savings

After gross program impacts have been assessed, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio that quantifies the percentage of the gross program impacts that can be reliably attributed to the program.

For PY3, the net program impacts were quantified from the estimated level of free-ridership. Quantifying free-ridership requires estimating what would have happened in the absence of the program. A customer self-report method, based on data gathered during participant telephone interviews, was used to estimate the free-ridership for this evaluation. The existence of participant spillover was qualitatively examined by identifying spillover candidates through questions asked in the participant telephone interviews. If response data provides sufficient detail to quantify participant spillover, those impacts are estimated.

Once free-ridership and participant spillover has been estimated the Net-to-Gross (NTG) ratio is calculated as follows:

NTG Ratio = 1 – Free-ridership Rate + Participant Spillover

Basic Rigor Free-Ridership Assessment

Free ridership was assessed using a customer self-report approach following a framework that was developed for evaluating net savings of California's 2006-2008 nonresidential energy efficiency programs. This method calculates free-ridership using data collected during participant telephone interviews concerning the following three items:

- A **Timing and Selection** score that reflected the influence of the most important of various program and program-related elements in the customer's decision to select the specific program measure at this time.
- A **Program Influence** score that captured the perceived importance of the program (whether rebate, recommendation, or other program intervention) relative to non-program factors in the decision to implement the specific measure that was eventually adopted or installed. This score is cut in half if they learned about the program after they decided to implement the measures *and* funds were committed before learning about the program (if funds were not committed, the program received full credit).
- A **No-Program** score that captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available. This score accounts for deferred free ridership by incorporating the likelihood that the customer would have installed program-qualifying measures at a later date if the program had not been available.

Each of these scores represents the highest response or the average of several responses given to one or more questions about the decision to install a program measure. The rationale for using the maximum value is to capture the most important element in the participant's decision making. This approach and scoring algorithm is identical to that used by the Ameren Illinois evaluators with the exact same questions.

Standard Rigor Free-Ridership Assessment

For larger projects in the sample[23] an effort is made during the customer telephone interview to more completely examine project influence sources in order to allow for any analyst-determined adjustments to customer self-reported score calculations using the Basic approach outlined above. Additional survey batteries examine other project decision-making influences including the vendor, age, availability of ARRA funds, and condition of existing equipment, government policy for efficiency improvements and so on. Any adjustments made on this basis are carefully documented and the rationale for any adjustments is provided, to ensure their transparency.

[23] Larger projects are the largest projects in the sample that combined to comprise approximately forty percent of program energy savings in the July 13, 2011 extract population from which the CATI sample was developed.

In a Standard Rigor Free-Ridership Assessment, program influence through vendor recommendations is incorporated into the Timing and Selection score, if a vendor interview has been triggered. The purpose of this additional component is to assess the influence of the program on vendors for programs that are vendor-driven, where the sponsor has specific outreach and assistance efforts targeting vendors.

Triggering of a vendor interview occurs when the interviewee responds as follows:

> The respondent identifies that a contractor, SEDAC representative, engineer, architect, manufacturer, distributor, or supplier:
>
> - was the most influential in identifying and recommending that the respondent install the project completed through the Public Sector Energy Efficiency Program, or
> - informed the respondent about the availability of an incentive through the DCEO Program
>
> AND, the respondent rates the importance with a score of 8 or higher for
>
> - Recommendation from an equipment vendor or contractor that helped with the choice of the equipment
> - A recommendation from a design or consulting engineer

When triggered, vendors were interviewed regarding their involvement in the project and the influence of the program in their recommendations to the participant. The NTG interview questions for vendors are provided below, and are the basis for estimating a Vendor Score, calculated as follows:

> The Vendor Score is the maximum (on a scale of 0 to 10) of the following factors:
>
> 1. [Score= response, on scale of 0 to 10] On a scale of 0 to 10 where 0 is NOT AT ALL IMPORTANT and 10 is EXTREMELY IMPORTANT, how important was the PROGRAM, including incentives as well as program services and information, in influencing your decision to recommend that <%CUSTOMER> install the energy efficiency MEASURE at this time?
> 2. [Score= 10 minus the response, on a scale from 0 to 10] And using a 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the PROGRAM, including incentives as well as program services and information, had not been available, what is the likelihood that you would have recommended this specific MEASURE to <%CUSTOMER>?

The algorithm above provides a Vendor Score on a scale of 0 to 10, where 10 is associated is with no free-ridership due to program influence on the vendor. The Vendor Score is then factored into the Timing and Selection Score.

The calculation of free-ridership for the Standard program is a multi-step process. The survey covers a battery of questions used to assess net-to-gross ratio for a specific end-use and site.

Responses are used to calculate a Timing and Selection score, a Program Influence score and a No-Program score for each project covered through the survey. These three scores can take values of 0 to 10 where a lower score indicates a higher level of free-ridership. The calculation then averages those three scores to come up with a project-level free-ridership level.

If the customer has additional projects at other sites covering the same end-use, the survey asks whether the responses also apply to the other projects. If that is the case, the additional projects are given the same score.

Spillover

For the PY3 Standard program evaluation, a battery of questions was asked to qualitatively assess spillover. Below are paraphrased versions of the spillover questions that were asked:

1. Since your participation in the DCEO program, did you implement any ADDITIONAL energy efficiency measures at this facility that did NOT receive incentives through any utility or government program?
2. What specifically were the measures that you implemented?
3. Why are you not expecting an incentive for these measures?
4. Why did you not install this measure through the DCEO Program?
5. Please describe the SIZE, TYPE, and OTHER ATTRIBUTES of these measures.
6. Please describe the EFFICIENCY of these measures.
7. Please describe the QUANTITY installed of these measures.
8. Were these measures specifically recommended by a program related audit, report or program technical specialist?
9. How significant was your experience in the DCEO Program in your decision to implement this Measure, using a scale of 0 to 10, where 0 is not at all significant and 10 is extremely significant?
10. Why do you give the DCEO program this influence rating?
11. If you had not participated in the DCEO program, how likely is it that your organization would still have implemented this measure, using a 0 to 10, scale where 0 means you definitely WOULD NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure?

Responses to these questions allow us to assess whether spillover may be occurring and the type of equipment involved, but do not offer enough detail to quantify the spillover.

NTG Scoring

The net-to-gross scoring approach is summarized in Table 5-2.

Table 5-2. Net-to-Gross Scoring Algorithm for the PY3 Standard Program

Scoring Element	Calculation
Timing and Selection score. Maximum score (on a scale of 0 to 10 where 0 equals not at all influential and 10 equals very influential) among the self-reported influence level the program had for: A. Availability of the program incentive B. Recommendation from a DCEO staff person C. Information from program marketing materials D. Endorsement or recommendation by utility account manager E. Other factors (recorded verbatim) F. Information provided through technical assistance received from DCEO or SEDAC staff G. Vendor Score (if triggered) Potential adjustments for non-program influences	Basic Rigor: Maximum of A, B, C, D, and E Standard Rigor: Maximum of A, B, C, D, E, F, and G, with potential adjustments for non-program influences
Program Influence score. "If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <ENDUSE>, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?"	Points awarded to the program (divided by 10). Divide by 2 if customer learned about program AFTER deciding to implement measure that was installed *and* funds were committed before learning about the program
No-Program score. "Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely," if the program had not been available, what is the likelihood that you would have installed exactly the same equipment?" The NTG algorithm computes the Likelihood Score as 10 minus the respondent's answer (e.g., likelihood score will be 0 if extremely likely to install exactly the same equipment if the program had not been available). Adjustments to the "Likelihood score" are made for timing: "Without the program, when do you think you would have installed this equipment?" Free-ridership diminishes as timing of the installation without the program moves further into the future.	Interpolate between Likelihood Score and 10 to obtain the No-Program score, where If "At the same time" or within 6 months then the No Program score equals the Likelihood Score, and if 48 months later then the No Program Score equals 10 (no free-ridership)
Project-level Free-ridership (ranges from 0.00 to 1.00)	1 – Sum of scores (Timing & Selection, Program Influence, No-Program)/30
Apply score to other end-uses within the same project?	If yes, assign free-ridership score to other end-uses of the same project
Apply score to other projects of the same end-use?	If yes, assign free-ridership score to same end-use of other projects
PY3 Project level Net-to-Gross Ratio (ranges from 0.00 to 1.00)	1 – Project level Free-ridership

5.4 *Other Appendices*

5.4.1 PY3 Tracking System and Default Values Check

The attached spreadsheet provides a verification check of default values identified in the tracking system lookup tables.

DCEO Savings per Measure Default Che

5.5 *Smart Energy Design Assistance Program Review*

5.5.1 Evaluation Objectives

To DCEO Standard evaluation team was given the task of conducting a preliminary assessment of the energy savings attributable to technical assistance provided to public and private sector clients through the Smart Energy Design Assistance Program that are not being reported by Ameren Illinois, ComEd, or DCEO for Energy Efficiency Portfolio Standard (EEPS) participation. The objectives of this task consisted of the following:

- Reviewing the SEDAP program and the technical basis for claimed savings
- Reviewing tracking data to assess reasonableness and functionality for evaluation
- Developing an estimate of an ex ante energy savings claim for the SEDAP effort
- As a pilot effort, estimate energy savings claimable by SEDAP for PY3 based on a "desk review" of tracking data
- Assessing the SEDAP program approach and data to identify gross and net verification approaches that can be deployed in future program years

The outcome of this effort is intended to support evaluation planning for a rigorous assessment of gross and net savings, if warranted.

5.5.2 Program Overview

The Smart Energy Design Assistance Center (SEDAC), implemented by the University of Illinois Building Research Council in partnership with the 360 Energy Group, provides outreach, training, and design assistance to Illinois businesses and public entities in energy efficiency. SEDAC was originally developed in 2005 by the State of Illinois, Department of Commerce and Economic Opportunity (DCEO). In response to growing energy costs and in support of Illinois businesses, DCEO developed the Small Business Smart Energy Program (SB$E), now called the Smart Energy Design Assistance Program (SEDAP).

In June 2008, under the Illinois Energy Efficiency Portfolio Standard (EEPS), the SEDAC program sponsorship expanded to include Ameren Illinois Utilities and ComEd and began offering program services to public sector buildings including municipal, state, federal, and educational facilities. As of June 30, 2011, the Illinois Smart Energy Design Assistance Program has provided information and support to 2,377 Illinois clients.

At no charge to the participants, the Smart Energy Design Assistance Program can provide energy efficiency advice or an in-depth building energy assessment to most Illinois business

and public entities with buildings greater than 20,000 square feet. Services are offered in four levels:

LEVEL 1: Quick Advice, No Application Required – Immediate advice offered over the telephone or by email, regarding the Smart Energy Design Assistance Program, energy efficiency technical questions, or to assess the need for program services. No eligibility requirements.

LEVEL 2: Energy Assessment – Application Required – Recommendations specific to the applicant's building. Some criteria apply, including potential for energy savings and the availability of needed building information. Priority is given to applicants who are ready to implement energy recommendations. Services include:

- The building energy assessment includes a list of recommended energy cost reduction measures (ECRMs) for the applicant's building.
- The assessment may cover the whole building or may address a specific need. Savings potential may or may not be quantified. Energy assessments for an existing facility may include a site visit, which are arranged after bills and plans are received and analyzed.

LEVEL 3: Design Assistance — In addition to the Level 2 analysis, the project leader does deeper analysis to assess complex buildings more fully, typically including a life cycle cost analysis to identify energy cost reduction measures (ECRMS) and potential savings.

- Assessment will include results and analyses using an energy simulation model.
- A cost-benefit analysis for upgrades will be performed to prioritize the ECRMs.

LEVEL 4: Implementation Assistance – Follow-up advice to program participants to assist with implementation of recommended energy cost reduction measures, such as advice on specific technical questions, help finding alternative financing assistance, and bid process support.

The source of energy savings estimates for the SEDAP program originates with the implementation of measures identified in the technical services provided at Level 2 and Level 3 assistance. SEDAC does not attempt to identify energy savings from delivery of Level 1 services, and Level 4 services provide support for savings identified at Level 2 and Level 3.

5.5.3 Evaluation Methods

This section describes the analytic methods and data collection activities implemented as part of the assessment of savings claimed as a result of SEDAP services. Key evaluation activities were:

- The evaluation team conducted one telephone call with SEDAC staff responsible for SEDAP oversight, implementation, and data tracking. This call took place in August of 2011 and covered program delivery, the typical measures recommended, the technical

basis for savings estimates, quality control procedures, the follow-up approach used to identify implemented savings, data tracking, and other issues related to verification of measures.

- Reviewed a sample Level 3 Feasibility Report for Energy Evaluation and Recommendations from a SEDAC site visit conducted in May 2010 of a public library, resulting in a report was sent out in August 2010.[24] The report and analysis focused on energy saving opportunities and life cycle cost estimates for various energy cost reduction measures (ECRMs). The report presented recommendations for energy saving investments resulting from the analysis, along with the methods and assumptions used.

- Reviewed program activity tracking data from SEDAC that identified estimated savings at the project-level for recommended measures and customer-reported implemented measures, plus key dates, implementation status, and participant information.[25]

- Reviewed the SEDAP Implementation Success Report from June 30, 2011.[26]

- Analyzed data to generate an ex ante estimate of the gross impact of SEDAP services for PY3.

- Outlined a verification approach and related issues.

5.5.4 Impact Evaluation Findings

Evaluation findings are summarized below.

Technical Basis for Claimed Savings Review

To review the technical basis for claimed savings, we discussed analysis methods with SEDAC, reviewed tracking data and the latest Implementation Success Report, and reviewed an example of a Level 3 audit report. The purpose of this task was to assess whether the claimed savings have a reasonable technical basis and can be verified.

The public library receiving the analysis report was built in 2004 and was approximately 100,000 square feet. The library analysis report totaled 39 pages and was the output of a comprehensive audit covering gas and electric energy saving opportunities. The report provided documentation on analysis approach, facility description including energy consuming electrical and mechanical systems, an analysis of energy consumption and bills, billed versus

[24] Data provided by email communication from Donald Fournier, September, 2011.
[25] Data provided by email communication from Donald Fournier, September, 2011.
[26] Data provided by email communication from Donald Fournier, September, 2011.

modeled energy consumption, and measure-level analysis and discussion of each energy savings recommendation. The report identified funding opportunities, including in this case the DCEO PSEE program.

Energy analysis for this project was conducted by SEDAC using Trane Trace simulation software. Model results were calibrated with energy bills. The audit report had sufficient detail that it would be possible to generate ex ante savings estimates for DCEO Standard lighting and vending machine control measures using program default values. Baseline reconstruction on more complex custom and retrocommissioning measures creates a greater challenge. Baseline conditions are described in some detail, but some measures involve findings of adjustments to control settings that can be readily fixed without a record of baseline or post-retrofit conditions, other than in the audit report. Trane Trace has capabilities to produce input parameter reports, which could be used in verification if the modeling files are still available. To verify savings for a specific project, we would request the audit report, modeling software parameter reports, and other project files.

We conclude that the energy savings estimates are reasonable for ex ante claims. If drawn as part of a sample, the audit report plus additional information should provide sufficient detail to develop an M&V plan for verification. The electric equipment retrofit recommendations that are typical of the DCEO Standard or utility prescriptive rebate programs, such as one-for-one lighting equipment replacements, should be readily verifiable because baseline descriptions, quantities, and operating strategies are provided in the client report. Impacts for custom and retrocommissioning type measures could have verified gross realization rates above or below 1.00, but SEDAC uses hourly simulation software or Excel models to generate savings estimates using site specific inputs, so there is a reasonable basis for ex ante estimates. Baseline reconstruction for custom and retrocommissioning measures may be challenging, but the analysis captures data to calibrate a baseline simulation against energy bills, so we would expect to identify key baseline parameters in most cases.

Tracking System Data Review

The tracking data provided by SEDAC was reviewed for reasonableness and functionality for use in verifying impact claims.

The tracking data provided covered the PY1 through PY3 period of EEPS programs. The earliest delivery date of a completed report was March 6, 2008, and two other reports were delivered before June 2008. Although those dates are prior to the start of PY1 on June 1, 2008, there is a lag between receipt of a SEDAP report and measure implementation, so installed measures would be occurring after the start of PY1. SEDAC continues to track implementation of measures based on structured protocol of regular follow-up through communication with clients that may continue for three years, if the client indicates ongoing interest and progress.

This time lag between audit and implementation creates a challenge for verification. Although some clients receive their reports and implement measures within an EEPS program year, most SEDAP implementation occurs over multiple program years. Measures implemented in PY3 may have been identified in PY1, PY2, or PY3. Further, measures implemented in PY3 at a project site may be incremental to measures implemented in previous program years. Due to time lag, sampling would need to consider the status of clients with reports delivered back to PY1. Clients who stay active in implementing measures would stay in the sample frame, even those evaluated in a previous year.

The tracking data provided by SEDAC included the following elements relevant to verification:

- Project-level status data includes project ID code, company name, utility, whether public or private, date report sent, report status, implementation status, and EEPS incentive received (true/false) by program year.
- Measure-level status data includes individual ECRMs identified for each project, noting measure name, implementation status of the measure, modeling approach, end-use designation, and notes from the SEDAC project lead on status (some with follow-up dates).
- Project-level impact data includes project-level status data, plus building square feet, overall implementation status, project total estimated savings (gas and electric) for recommended measures, project total estimated savings for implemented measures, project cost and dollar savings, client contact name and telephone number, SEDAC project lead, construction and client type, and notes.

Although projects record measure-level implementation status, it is generally not possible to identify exactly when a measure was implemented. There is no requirement made of the client to implement measures, and no incentive through SEDAP to implement or report measures. SEDAC does encourage measure reporting, and follow-up is conducted on a regular basis by SEDAC project leads, typically every 3 to 9 months. Measures can move from "reviewing" to "implemented" during that the follow-up window, so assigning an implemented measure to a program year is only approximate. Dates are sometimes provided.

Although SEDAC attempts to identify whether a client has taken advantage of EEPS incentive programs, this should be verified for each measure prior to conducting evaluation verification of SEDAP savings. The tracking database and audit reports would provide enough information to identify a customer, the premise, and measure descriptions, and this could be checked against DCEO, Ameren, or ComEd participation records.

The SEDAP approach to identifying implemented measures creates a challenge for verifying savings for any specific EEPS program year, because the tracking data is not does define a program year population of implemented measures with certainty.

To avoid double counting of savings, it would be necessary to include measures that were implemented but did not receive an incentive ***and*** ensure that measures implemented are no longer eligible for an EEPS incentive.

If the contact information is up-to-date, the tracking data would be sufficient to conduct a telephone survey of SEDAP participants regarding their experiences with the program, and confirm basic measure level information. Net-to-gross questions could also be asked, however, there could be up to three years between report delivery and the telephone interview.

Estimate of Ex Ante Savings for SEDAP Technical Services

The tracking data provided by SEDAC was reviewed to estimate ex ante energy savings for electric efficiency measures implemented through SEDAP. Results are shown for two scenarios:

- A "Same Year" scenario that tracks measures implemented in the same year the client report was delivered (PY3), as shown in Table 5-3.
- A "Cumulative" scenario that attempts to estimate implemented savings as of June 30, 2011 from client reports delivered during the PY1 through PY3, as shown in Table 5-4.

The estimated savings show the implementation status of recommended measures in seven tracked categories. Three categories, "implemented," "starting implementation," and "no implementation" are categories where the client has made a decision and communicated that to SEDAC. The remaining four status categories indicate either that the client is engaged in planning or review of recommendations or has not communicated their intentions to SEDAC. The estimated savings is shown in two categories – the project-level savings recommended in the audit report, and the estimated savings of measures that clients reported were implemented.

As shown in Table 5-3, reports were delivered to 190 clients of SEDAP during the year that approximately coincides with EEPS PY3 (we included reports delivered through June 30, 2011 to be consistent with SEDAC reported data). From the reports delivered, 40 clients reported to SEDAC that they had implemented one or more measures (13 clients) or had started implementing measures (27 clients). These 40 clients had a total of 11.56 million kWh of energy saving measures recommended to them, and had implemented or started implementing 4.77 million kWh of energy savings. The "same-year" estimated savings of 4.77 million kWh is 11 percent of total savings identified in reports delivered in PY3.

Comparing Table 5-3 with Table 5-4, one can see the large lag that occurs between report delivery and measure implementation. The "cumulative" implemented savings of Table 5-4 is 26.28 million kWh, from the period covering reports delivered in PY1 through June 30, 2011. During that period, the cumulative recommended savings was 145.98 million kWh.

Table 5-3. PY3 SEDAP Estimated Savings from EEPS Clients (Same-Year Implementation)

Implementation Status of Reports Issued in PY3			Project-Level Estimated Savings - Recommended in Report				Measure-level Estimated Savings With Decision to Implement in PY3			
Ending 6/30/11	Client Count	% Clients	kWh	% kWh	kW	% kW	kWh	% of Rec.	kW	% of Rec.
Implemented*	13	7%	3,091,265	7%	546	7%	2,199,165	71%	425	78%
Starting implementation	27	14%	8,467,838	20%	1,606	22%	2,573,769	30%	362	23%
Planning to implement	33	17%	5,175,216	12%	1,025	14%				
Reviewing recommendations	101	53%	24,630,770	59%	4,066	55%				
No implementation	6	3%	279,109	1%	44	1%				
No Information - Unreachable	2	1%	132,948	0%	61	1%				
Unknown Status	8	4%	-	0%	-	0%				
TOTAL	190	100%	41,777,146	100%	7,348	100%	4,772,934	11%	787	11%

Source: Navigant analysis of SEDAP tracking data.

Table 5-4. PY3 SEDAP Estimated Savings from EEPS Clients (Cumulative PY1-PY3 Implementation)

Implementation Status of Reports Issued PY1-PY3			Project-Level Estimated Savings – Recommended in Report				Measure-level Estimated Savings With Decision to Implement as of 6/30/11			
Ending 6/30/11	Client Count	%	kWh	% kWh	kW	% kW	kWh	% of Rec.	kW	% of Rec.
Implemented*	131	25%	40,130,314	27%	5,312	19%	20,775,088	52%	3,542	67%
Starting implementation	73	14%	25,247,111	17%	4,601	16%	5,500,203	22%	996	22%
Planning to implement	80	15%	26,393,644	18%	4,019	14%				
Reviewing recommendations	164	31%	47,587,807	33%	6,818	24%				
No implementation	26	5%	2,065,121	1%	690	2%				
No Information - Unreachable	17	3%	4,369,150	3%	6,725	24%				
Unknown Status	30	6%	184,747	0%	67	0%				
TOTAL	521	100%	145,977,894	100%	28,232	100%	26,275,291	18%	4,538	16%

Source: Navigant analysis of SEDAP tracking data.

The implemented measure savings includes projects that have received an EEPS incentive, as well as those that have not. The tracking data indicated that 37 clients had taken advantage of an EEPS incentive program in either PY1 (6 instances), PY2 (8 instances) or PY3 (26 instances) including three that had participated in multiple years. Although it would have been possible to filter out measures the SEDAC had identified as receiving EEPS incentives, we included all measures in the tables because it provides a more complete picture of the scale of the SEDAP effort statewide. Separating EEPS rebated from non-rebated measures is a critical step in verifying the savings claim for SEDAP, therefore, we believe the population for verification should include both measure categories.

SEDAP Impact Verification Estimate

In PY3, a pilot effort within the Standard program evaluation was made to quantify energy savings implemented as a result of technical services provided by the Smart Energy Design Assistance Center (SEDAC) through the Smart Energy Design Assistance Program (SEDAP). The evaluation assessment was conducted to identify savings resulting from SEDAC services that have not been claimed through incentive programs operated by DCEO, ComEd, or Ameren Illinois.

Based on desk-review of SEDAC tracking data, our evaluation assessment concluded SEDAP is generating energy savings that are not being claimed by other programs. The measures recommended through SEDAP include equipment retrofits and operational improvements. The measures we believe are not being claimed by other programs include equipment retrofits that are not eligible for prescriptive or custom rebates, and operational improvements. The implementation of savings is estimated by SEDAC staff from regular follow-up with service recipients who identify progress on implementing audit report recommendations. The tracking records suggest that SEDAC staff is effective at steering technical service recipients to ComEd, Ameren Illinois, and DCEO programs for incentives on eligible measures.

Our evaluation review consisted of reviewing SEDAC measure-level tracking data for each of the 39 projects with PY3 service recipients who reported completing or starting measure implementation.[27] Where recipients had reported completing the measure implementation process, we could identify measures assignable as unclaimed SEDAP savings from measures that had been submitted for EEPs incentives. Only a small portion of savings potentially assignable to SEDAP fell into this category. The bulk of potential SEDAP claimable savings implemented by service recipients could not be separated and verified at the measure level from savings potentially claimed by an EEPs incentive program because action on recommendations were partially implemented and still ongoing. Verification would require project documentation review and site-specific data collection by the evaluation team once the

[27] For this estimate, we use the population of projects with reports delivered June 1, 2010 through May 31, 2011.

SEDAP participant had concluded work on the audit recommendations. Table 5-5 provides a summary of our assessment of SEDAC tracking data.

Table 5-5. Verified and Potential Energy Savings Claimable through SEDAP Services

Evaluation Assessment Category	Project Count	Implemented Savings, kWh			Measure not yet implemented, assignment to EEPs or SEDAP to be determined, kWh
		EEPs, "desk verified"	SEDAP, "desk verified"	EEPs or SEDAP, to be verified	
PY3 Implementation completed, EEPs savings claimed	7	1,375,147		-	-
PY3 Implementation completed on measures claimable by SEDAP, with some measures not yet implemented	10	-	146,813	-	905,554
PY3 Implementation completed on measures claimable by EEPs, with some measures not yet implemented	3	113,852	-	-	1,001,609
PY3 Implementation in-progress	19	444,448	-	2,692,674	4,918,409
SEDAP PY3 services provided, implementation not begun	140				30,178,640
Subtotal, All SEDAP PY3 services	**179**	**1,933,447**	**146,813**	**2,692,674**	**37,004,212**
Subtotal, All SEDAP PY1 and PY2 services	**342**			**21,502,357**	**82,698,391**
Total, All SEDAP services, PY1 through PY3	**521**	**1,933,447**	**146,813**	**24,195,031**	**119,702,603**

Source: Evaluation analysis of tracking data provided by SEDAC.

The 146,813 kWh of desk review verified savings from SEDAP in PY3 shown in Table 5-5 consists only of savings resulting from technical services provided during PY3. A second block of PY3 implemented energy savings totaling 1,375,147 kWh was identified by SEDAC as

measures that had participated in an EEPs incentive program. The third and largest category PY3 implemented energy savings totaling 2,692,674 kWh involved projects where the contact had indicated implementation was in-progress. Although some measures had been implemented, we could not verify from the data how much of the savings to assign to SEDAP versus measures that could be counted toward EEPs. On some projects, additional detail from SEDAC to provide implemented savings on a measure level would allow us to categorize measures as either SEDAP claimable or EEPs even if work was still ongoing at the facility. In other cases, we would need to wait until EEPs eligible work at the facility had been completed in order to make a determination due to the complexity of the project and potential for measure interactions.

Our review of SEDAP tracking data indicated that approximately 21,502 MWh of energy savings measures from SEDAP services provided during PY1 and PY2 were reported implemented by the end of PY3. It was not possible to quantify SEDAP claimable savings for PY3 from services provided in PY1 and PY2 from the data. It may be possible to quantify implemented savings from prior year's technical services through site-specific data collection.

5.5.5 Key Conclusions and Recommendations

Evaluation team review of SEDAP services and tracking data supports a finding that there is a reasonable basis for asserting that SEDAP technical assistance results in implementation of electric energy saving measures. Some of the measures identified are implemented with incentives from an EEPS program and would be tracked and counted through those programs, while SEDAP clients also indicate implementation of measures that have not received an EEPS incentive, and are therefore not tracked by ComEd, Ameren Illinois, or DCEO.

An attempt was made to verify SEDAP claimable savings through desk review of tracking system data, summarized in Table 5-5. Based on our desk review of SEDAC tracking data, measure savings claimable for SEDAP are similar to those implemented through the retrocommissioning program offered by DCEO. To estimate the size of potential net savings from SEDAC services, we recommend the gross energy realization rate (0.795) and net-to-gross ratio (0.98) from the PY3 Retrocommissioning evaluation be applied to evaluation verified savings. Applying these ratios to the 146,813 kWh of evaluation verified gross ex ante savings for SEDAP yields 114,382 kWh of verified net savings that could be claimed for SEDAP in PY3. With additional measure-level savings data from SEDAC and site verification by evaluators on a sample of the 2,692,674 kWh recommended and implemented in PY3 plus PY3 implementation from prior years' services, the evaluation verified savings for SEDAP in PY3 could be much higher.

Our review did not include sampling and site-level data collection that would allow us to verify all savings reported as implemented by SEDAP service recipients, however, there is sufficient project and measure-level data from SEDAC that such an effort could be pursued. The savings

impact shown in Table 5-3 and Table 5-4 provide an estimate of the population of projects from which a verification sample could be drawn. To determine an ex ante basis for savings attributable to the SEDAP program not already counted in an EEPS incentive program, it would be necessary to review each project in the population of projects with implemented measures, and verify with ComEd, Ameren Illinois, and DCEO whether they had participated, and if so, with which measures. One would then need to subtract out measures that had received an EEPS incentive (or were still eligible to receive an incentive) to end up with an estimate of ex ante gross savings implemented as a result of SEDAP without EEPS incentives. The ex ante gross estimate could then be verified for gross and net impacts. The gross impacts could be verified through sampling and conducting evaluation site visits, and the net-to-gross ratio could be estimated through telephone interviews.