# Evaluation of Illinois Energy Now Public Sector Custom, Standard, and New Construction Incentives Programs

June 2011 through May 2012

Prepared for:

Illinois Department of Commerce and Economic Opportunity

Prepared by:


ADM Associates, Inc.
3239 Ramos Circle
Sacramento, CA 95827
916.363.8383

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# Executive Summary

This report presents the results of the impact and process evaluations of the Public Sector Custom and Standard Incentives Programs (Custom and Standard Incentives Programs and New Construction (NC) Program of the (New Construction Program) that the Illinois Department of Commerce and Economic Opportunity (DCEO) offers to public sector entities. This report presents results for electric program year four and natural gas program year one (PY4/GPY1), which is defined as the period from June 2011 through May 2012.

The main features of the approach used for the evaluation of the Custom and Standard Incentives Programs and New Construction Program are as follows:

- Data for the study were collected through review of program materials, on-site inspections, end-use metering, and interviews with DCEO staff members, program partner staff members, and participating public sector entities' staff and contractors. Based on data provided by DCEO and its program implementation contractor, a sample design was developed for on-site data collection. Samples were drawn for both the custom incentive and Standard Incentives Program components that provide savings estimates for each component with ±10% precision at the 90% confidence level. Table ES-1 shows the sample sizes for different types of data collection employed for the Custom and Standard Incentives Programs. Table ES-2 shows the sample sizes for different types of data collection employed for the New Construction Program.
- On-site visits were used to collect data for savings impact calculations, to verify measure installation, and to determine measure operating parameters. Facility staff were interviewed to determine the operating hours of the installed system and to locate any additional benefits or shortcomings with the installed system. For the majority of sites, lighting equipment, HVAC equipment, or motors/VFDs were monitored in order to obtain accurate information on hours of operation. For the Custom and Standard Incentives Programs, the 99 projects for which on-site measurements and verification data were collected accounts for approximately 68% of Custom Incentives Program expected kWh savings, 35% of the Standard Incentives Program expected kWh savings, and 83% of Custom Incentives Program expected therm savings. For the New Construction Program, there were six projects for which on-site measurements and verification data were collected accounts for approximately 34% of expected kWh savings.
- Participant surveys provided the information for the net-to-gross analysis and process evaluation. For Custom and Standard Incentives Programs, a total of 292 participant decision makers were interviewed. For the New Construction Program, two participant decision makers were interviewed. Additionally, relevant DCEO staff members were interviewed to provide information for the process evaluation.

*Table ES-1 Sample Sizes for Data Collection Efforts Custom and Standard Incentives Programs*

| *Type of Data Collected* | *Sample Size* |
|---|---|
| Project On-Site Measurement and Verification | 99 |
| Participant Decision Maker Survey | 292 |
| Trade Ally Survey | 50 |

*Table ES-2 Sample Sizes for Data Collection Efforts New Construction Program*

| *Type of Data Collected* | *Sample Size* |
|---|---|
| Project On-Site Measurement and Verification | 1 |
| Participant Decision Maker Survey | 2 |

Gross savings were estimated using proven techniques, including industry standard engineering calculations and verification of computer simulations developed by program contractors to determine energy savings.

In order to estimate free ridership in the program, survey-based techniques were applied to the data collected through a survey of decision makers.

The realized energy savings of the custom and standard components of the Custom and Standard Incentives Programs and New Construction Program during the period June 2011 through May 2012 are summarized in Table ES-3, Table ES-4, and Table ES-5. During this period, Custom Incentives Program realized gross energy savings totaled 57,254,082 kWh, while Standard Incentives Program realized gross energy savings totaled 66,357,365 kWh. For the New Construction Program, gross energy savings totaled 1,737,225. The gross realization rate for the Custom Incentives Program is 96%, while the gross realization rate for the Standard Incentives Program is 118%. For the New Construction Program, the gross realization rate is 91%.

During this period, Custom Incentives Program realized net energy savings totaled 54,076,457 kWh, while Standard Incentives Program realized net energy savings totaled 64,041,574 kWh. For the New Construction Program, realized net energy savings totaled 1,655,708. The net to gross ratio for the Custom Incentives Program is 94%, while the net to gross ratio for the Standard Incentives Program is 97%. For the New Construction Program, the net to gross ratio is 95%. Total net peak kW savings for Custom Incentives Program totaled 5,831, while net peak kW savings for Standard Incentives Program totaled 9,255. For the New Construction Program, net peak kW savings totaled 179.

*Table ES-3 Summary of kWh Savings for Custom Incentives Program*

| *Utility* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Gross Realization Rate* | *Realized Net kWh Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|---|
| Ameren | 16,469,402 | 16,098,932 | 98% | 15,205,435 | 94% |
| ComEd | 43,324,146 | 41,155,149 | 95% | 38,871,022 | 94% |
| Total | 59,793,548 | 57,254,082 | 96% | 54,076,457 | 94% |

*Table ES-4 Summary of kWh Savings for Standard Incentives Program*

| *Utility* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Gross Realization Rate* | *Realized Net kWh Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|---|
| Ameren | 12,737,810 | 14,121,122 | 111% | 13,628,312 | 97% |
| ComEd | 43,414,120 | 52,236,242 | 120% | 50,413,262 | 97% |
| Total | 56,151,930 | 66,357,365 | 118% | 64,041,574 | 97% |

*Table ES-5 Summary of kWh Savings for New Construction Program*

| *Utility* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Gross Realization Rate* | *Realized Net kWh Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|---|
| Ameren | 1,510,708 | 1,380,060 | 91% | 1,315,303 | 95% |
| ComEd | 390,977 | 357,165 | 91% | 340,405 | 95% |
| Total | 1,901,685 | 1,737,225 | 91% | 1,655,708 | 95% |

The realized therm savings of the custom and standard components of the Custom and Standard Incentives Programs and New Construction Program during the period June 2011 through May 2012 are summarized in Table ES-6 Table ES-7 Table ES-8. During this period, Custom Incentives Program realized gross therm savings totaled 2,535,123 kWh, while Standard Incentives Program realized gross energy savings totaled 70,548 kWh. For the New Construction Program, gross energy savings totaled 13,854. The gross realization rate for the Custom Incentives Program is 109%, while the gross realization rate for the Standard Incentives Program is 67%. For the New Construction Program, the gross realization rate is 109%.

Total net therm savings for the Custom Incentives Program totaled 2,193,620, while net therm savings for the Standard Incentives Program totaled 60,250. For the New Construction Program, net therm savings totaled 11,907. The net to gross ratio for the Custom Incentives Program is 87%, while the net to gross ratio for the Standard Incentives Program is 85%. For the New Construction Program, the net to gross ratio is 86%.

*Table ES-6 Summary of Therm Savings for Custom Incentives Program*

| *Utility* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Gross Realization Rate* | *Realized Net Therm Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|---|
| Ameren | 680,491 | 680,935 | 100% | 589,207 | 87% |
| Nicor | 442,426 | 241,615 | 55% | 209,068 | 87% |
| North Shore | 197,063 | 72,236 | 37% | 62,505 | 87% |
| Peoples | 997,764 | 1,540,336 | 154% | 1,332,839 | 87% |
| Total | 2,317,745 | 2,535,123 | 109% | 2,193,620 | 87% |

*Table ES-7 Summary of Therm Savings for Standard Incentives Program*

| *Utility* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Gross Realization Rate* | *Realized Net Therm Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|---|
| Ameren | 23,327 | 11,206 | 48% | 9,570 | 85% |
| Nicor | 58,337 | 36,699 | 63% | 31,342 | 85% |
| North Shore | 6,377 | 5,427 | 85% | 4,635 | 85% |
| Peoples | 17,700 | 17,215 | 97% | 14,702 | 85% |
| Total | 105,741 | 70,548 | 67% | 60,250 | 85% |

*Table ES-8 Summary of Therm Savings for New Construction Program*

| *Utility* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Gross Realization Rate* | *Realized Net Therm Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|---|
| Ameren | 3,929 | 4,283 | 109% | 3,681 | 86% |
| Nicor | 8,781 | 9,571 | 109% | 8,227 | 86% |
| Total | 12,710 | 13,854 | 109% | 11,907 | 86% |

The following presents a selection of key findings from EPY4/GPY1:

- **High Program Satisfaction:** EPY4/GPY1 participants noted high levels of satisfaction with the programs. Few problems were noted regarding the implementation of the efficiency measures, the application process, the incentive amount, or the receipt of the incentive. In many of the open-ended responses, several participants stated that they were satisfied with the program and grateful for the assistance.

  Participant satisfaction is an important asset for the programs. Public sector organizations tend to collaborate and share information and other resources. Satisfied participants are more likely to encourage their colleagues to participate in the program. This word of mouth effect will be an important driver of future program activity.

- **Lack of Available Funding is an Important Barrier:** The barrier to making energy efficiency improvements most frequently mentioned by participants was a lack of financial resources. This suggests that the public sector organizations who participated during the program year were encouraged to implement efficiency improvements because the incentives offset the initial cost. The reduced cost could facilitate the completion of projects because

public sector entities by allowing projects to meet budget requirements, the allowing projects to comply with least cost purchasing rules, or by lowering project costs below thresholds that require projects to be funded with a capital request. Regarding the last point, capital requests for efficiency improvements often have to compete for funding with other higher priority projects and thereby may not receive funding because other priorities take precedence. Moreover, participants reported that the approval time for capital requests was longer than the average approval time for equipment purchases in general. The hazards of the capital approval process may negatively impact public sector entities ability to implement efficiency improvements and incentive payments may allow projects to avoid this process.

The informational resources provided through the programs may also have increased the implementation of energy efficient technologies by the public sector entities. One-fifth of survey respondents stated that lack of information on efficient technologies and practices was a barrier to implementing energy efficiency improvements. The DCEO and its partners provide prospective participants with a number of informational resources that can help fill this knowledge gap in public sector entities and encourage the adoption of efficient equipment.

- **Program Staff are Improving Program Administration:** Interviewed program staff discussed program operation and management challenges that have been identified as well as solutions to address these problems. Examples of challenges the program has faced were delays that occurred in assembling program materials at the beginning of the program year due to administrative burdens and reductions in staffing that have occurred. In response to these challenges, program staff members have made efforts to release program materials sooner and re-assigned program functions to other staff and program partners. Program staff members' adaption to identified problems and changing circumstances will continue to serve the programs well in the future.

- **Increasing Building Code Requirements may Increase Marginal Cost of Above Code Efficiency Improvements:** The 2012 International Energy Conservation Code (IECC) became effective in the State of Illinois in January 2013. The new code requires that new buildings are constructed to higher efficiency standards than what was required by the previous 2009 IECC. As more efficiency improvements are required by code, efficiency improvements beyond code requirements may be more difficult to achieve and come at a higher marginal cost. The increasing requirements for energy efficient new construction may limit program activity in the New Construction Program because efficiency improvements above new code requirements may become cost prohibitive.

While program staff members have continually made efforts to improve the organization and efficiency of the programs, several recommendations have been developed based on interview findings and overall analysis of program processes. These recommendations may provide advantage in future program years:

- **Consider Providing Additional Communication Support to Increase Participation:** Program staff may consider offering additional communication support to participating public sector entities in order to encourage additional participation. This support would include helping participants develop press releases that emphasize the financial benefits of energy efficiency improvements. This might be a particularly useful strategy for the New Construction Program which has seen less program activity. Evaluations of other public sector programs have found that this form of communication support is well received because it provides recognition of the efforts of staff members of public sector organizations, and it demonstrates to the local community that the school district or local government is using tax dollars wisely.[1]

- **Improve Documentation and Project Tracking Data:** Review of project documentation during the evaluation effort was complicated by project files containing multiple versions of documentation with different estimations of savings. Determining which documents were the final documents for the project was made more complicated by discrepancies between savings estimates in the documents and the savings in the project tracking data. The documentation should be organized such that there are documents that are clearly identified as the final documentation with saving estimations that correspond to the savings in the project tracking database. Improved transparency of documentation will reduce the administrative effort required to evaluate the program as well as the cost of the evaluation.

- **Better Documentation of Methods Used to Estimate Project Savings:** Improvement in the documentation of the savings estimation methodology will enable the identification of the reasons for discrepancies between program estimated savings and the realized savings. The methodology does not necessarily need to be documented for each project, but the formulas used and the "per unit" savings that are applied to project variables such as the number of lamps installed in different space types should be provided.

- **Target New Construction Projects Early in the Design Process:** Program staff reported that prospective participants in the New Construction Program must have their project plans completed before they can apply for incentive funds. This strategy helps to ensure that a larger share of applicant projects are completed and result in program savings. However, the downside is that once program plans are finalized, opportunities for deeper savings may have been missed. Program staff should continue to refer prospective applicants that are early in

[1] *Rose, A., Stimmel, J., Oyhenart, J., and Ahrens, A. (2008). Breaking down silos: Bridging the communications and knowledge gap between departments to implement energy efficiency in the public sector. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

the design process to their program partner, SEDAC, but should also seek to market the program in ways that reach projects early in the design process. One way to do this is by cultivating relationships with architecture and design firms that develop public sector new construction projects.

# 1. Introduction

This section presents the results of the impact and process evaluations of the Public Sector Custom and Standard Incentives Programs (Custom and Standard Incentives Program) and the Public Sector New Construction Program (New Construction Program) that Illinois Department of Commerce and Economic Opportunity (DCEO) offers to public sector entities. This report presents results for electric program year four and natural gas program year one (EPY4/GPY1), which is defined as the period from June 2011 through May 2012.

## 1.1 Description of Programs

The Custom and Standard Incentives Programs and the New Construction Program offered by DCEO were designed to help the public sector identify and implement energy saving projects. The three programs evaluated in this report are described as follows.

### 1.1.1 Custom and Standard Incentives Programs

The Custom Incentives Program generates kWh and natural gas savings through helping public sector entities identify and implement energy savings projects. During EPY4/GPY1, the program provided incentives of $0.12 per kWh saved and $1.25 per therm saved. A payback period of one to seven years is required for custom incentive projects. The program also offered an additional $0.30 per kWh saved for pilot projects involving breakthrough equipment for exterior lighting, namely LED and induction lighting. These projects may have payback periods exceeding seven years.

The Standard Incentives Program generates kWh and natural gas savings through helping public sector entities identify and implement energy savings projects. Incentives are payments for qualify equipment purchased and installed by the participant.

Incentives provided by the program cannot exceed 100% of the incremental measure cost and 75% of the total project cost. If incentives are provided from other public sources, the combined public source incentives cannot exceed 100% of the total project cost. Additionally incentive awards cannot exceed $300,000 unless multiple project locations are included.

Expected kWh savings by utility for the Custom and Standard Incentives Programs are shown in Table 1-1. There were 400 Custom Incentives Programs projects during the period June 2011 through May 2012, which were expected to provide savings of 59,793,548 kWh. Additionally, there were 1,168 Standard Incentives Program projects during the period June 2011 through May 2012, which were expected to provide savings of 56,151,930 kWh.

*Table 1-1 Expected kWh Savings for Custom and Standard Incentives Programs by Utility*

| *Utility* | *Expected kWh Savings* | |
|---|---|---|
| | *Custom Incentives Program* | *Standard Incentives Program* |
| Ameren | 16,469,402 | 12,737,810 |
| ComEd | 43,324,146 | 43,414,120 |
| Total | 59,793,548 | 56,151,930 |

Expected therm savings by utility for Custom and Standard Incentives Programs are shown in Table 1-2. There were 69 Custom Incentives Programs projects during the period June 2011 through May 2012, which were expected to provide savings of 2,317,745 therms. The Standard Incentives Programs projects during the same period were expected to provide savings of 105,741 therms.

*Table 1-2 Expected Therm Savings for Custom and Standard Incentives Programs by Utility*

| *Utility* | *Expected Therm Savings* | |
|---|---|---|
| | *Custom Incentives Program* | *Standard Incentives Program* |
| Ameren | 680,491 | 23,327 |
| Nicor | 442,426 | 58,337 |
| North Shore | 197,063 | 6,377 |
| Peoples | 997,764 | 17,700 |
| Total | 2,317,745 | 105,741 |

### 1.1.2 New Construction Program

The New Construction Program generates kWh and natural gas savings through new construction and major renovation of public sector buildings that exceed the current Illinois Energy Conservation Code for Commercial Buildings. During EPY4/GPY1, the commercial conservation code in force was the 2009 International Energy Conservation Code and applicable provisions of the American Society for Heating, Refrigerating and Air-Conditioning Engineers Standard 90.1-2007. Applicants requesting grant funds for electricity conservation measures must do so for sites serviced by Ameren Illinois or ComEd. Grant funds are available gas conservation measures for sites serviced by Ameren Illinois, Nicor, Peoples, or North Shore.

New Construction Program incentives are structured to encourage construction and major renovation projects that result in buildings that use less energy than buildings constructed to code requirements. There are two components to the incentives: a base incentive rate and a bonus rate for applicants seeking LEED Silver, Gold, or Platinum designation. The base rate incentives are $0.08 per above code kWh saved and $0.80 per above code therm saved. The bonus incentive rates are tiered to the level of above code building performance and are described below:

- $0.20 per square foot for building 10% above code;

- $0.40 per square foot for building 15% above code;
- $0.60 per square foot for building 20% above code;
- $0.80 per square foot for building 25% above code; and
- $1.00 per square foot for building 30% above code.

Total incentives cannot exceed 100% of the incremental measure cost and 75% of the project cost. If additional incentives are provided from other public sources, the total public source incentives cannot exceed 100% of the total project cost. Moreover, the total base and bonus incentive cannot exceed $2.50 per square foot and the total incentive cannot exceed $300,000.

Preapproval of projects is strongly encouraged and incentives for certain measure may not be allowed if pre-retrofit equipment is not identifiable.

Expected kWh and therm savings by program are shown in Table 1-3 and Table 1-4. There were 6 incentive projects the program during the period June 2011 through May 2012, which were expected to provide savings of 1,901,685 kWh and 12,710 therms.

*Table 1-3 Expected kWh Savings for New Construction Program by Utility*

| *Utility* | *Expected kWh Savings* |
|---|---|
| Ameren | 1,510,708 |
| ComEd | 390,977 |
| Total | 1,901,685 |

*Table 1-4 Expected Therm Savings for New Construction Program by Utility*

| *Utility* | *Expected Therm Savings* |
|---|---|
| Ameren | 3,929 |
| Nicor | 8,781 |
| Total | 12,710 |

Figure 1-1 shows the Custom Incentives Program's ex post kWh savings by the date of application submission.

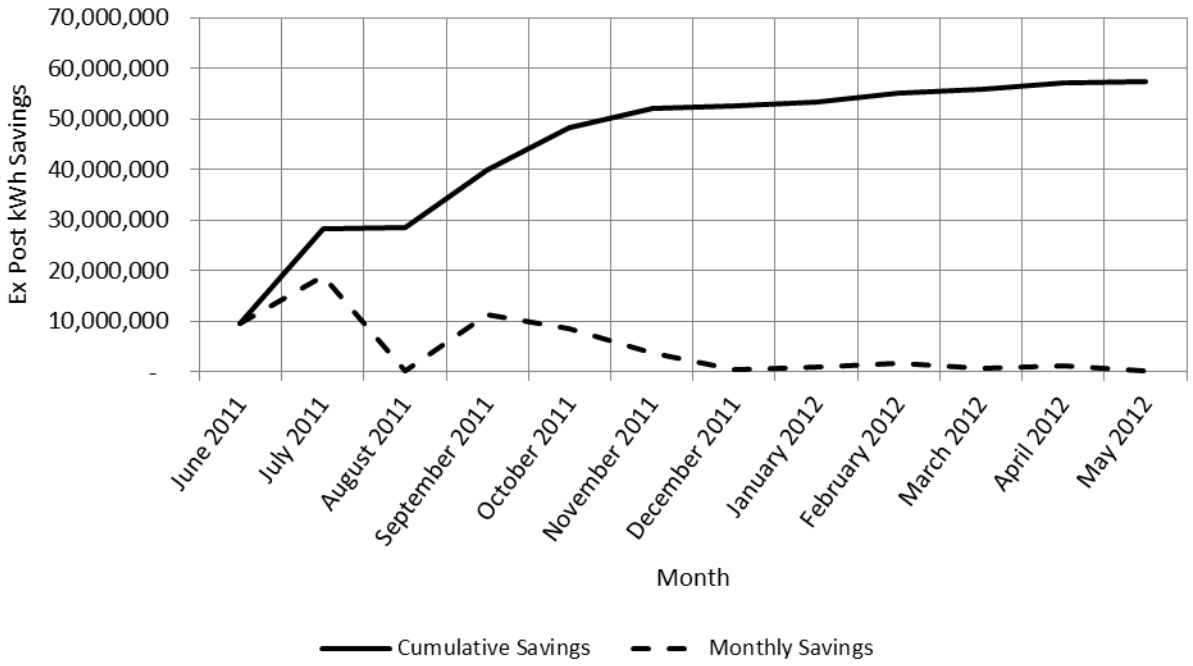


*Figure 1-1 Custom Incentives Program Cumulative Ex Post kWh Savings by Date of Application Submission*

Figure 1-2 shows the Standard Incentives Program's ex post kWh savings by the date of application submission.

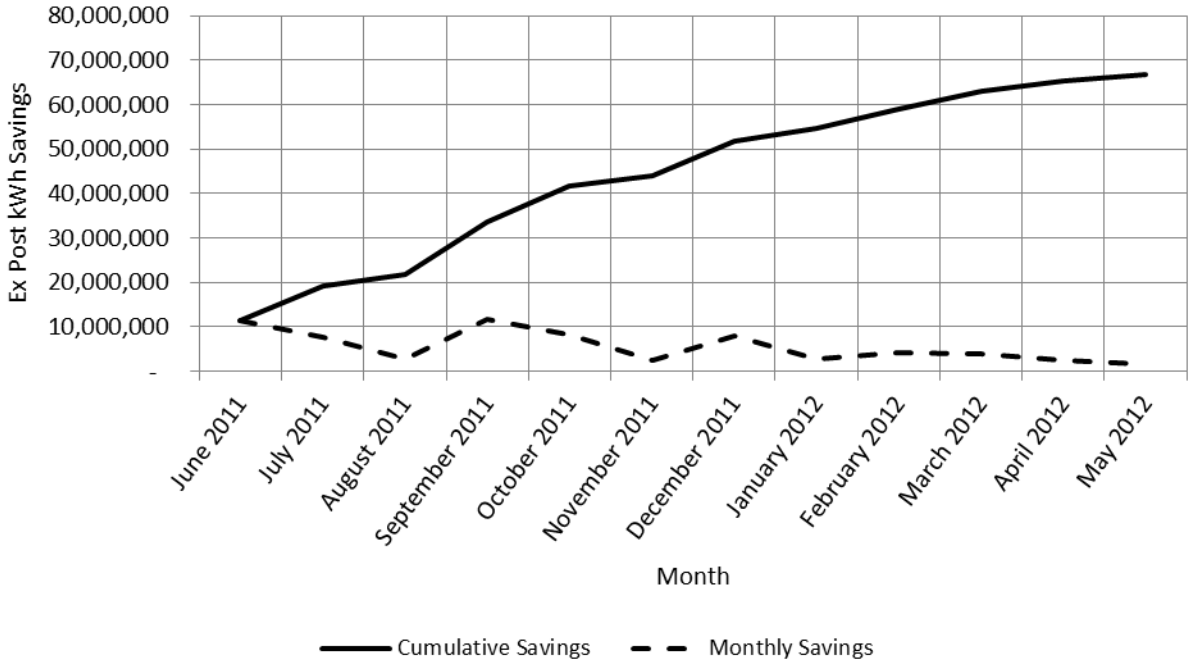


*Figure 1-2 Standard Incentives Program Cumulative Ex Post kWh Savings by Date of Application Submission*

Figure 1-3 shows the Custom Incentives Program's ex post therm savings by the date of application submission.

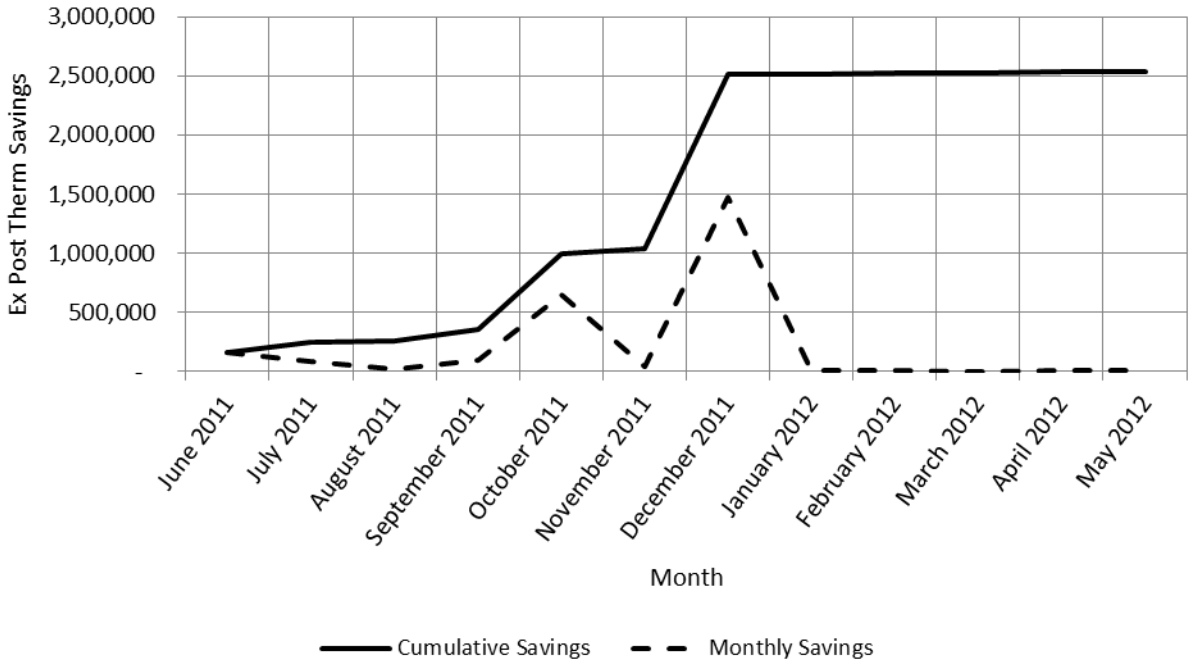


*Figure 1-3 Custom Incentives Program Cumulative Ex Post Therm Savings by Date of Application Submission*

Figure 1-4 shows the Standard Incentives Program's ex post Therm savings by the date of application submission.

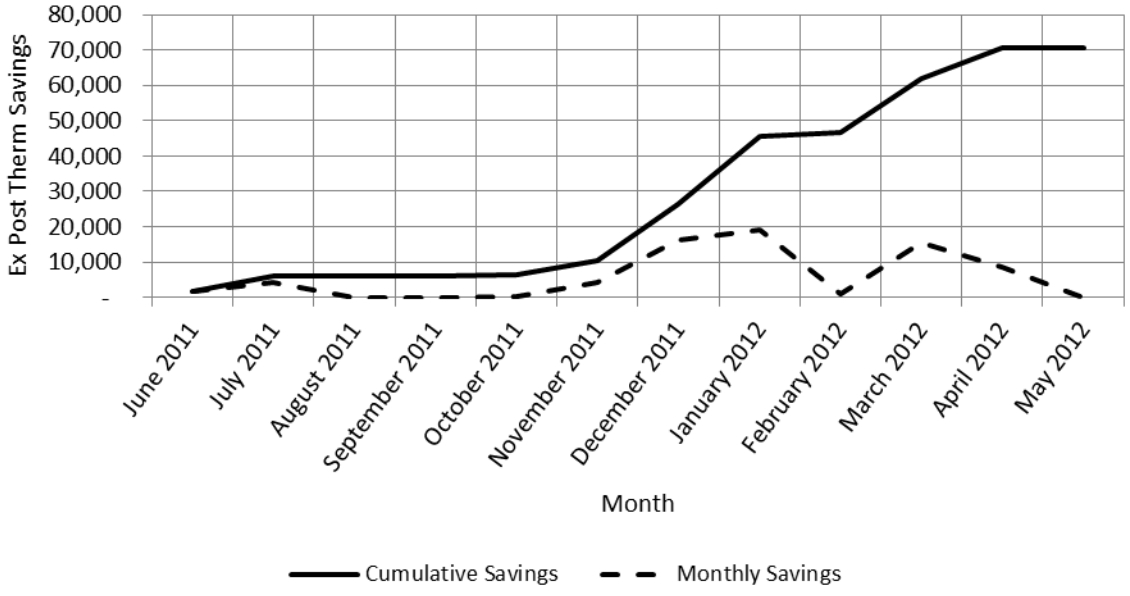


*Figure 1-4 Standard Incentives Program Cumulative Ex Post Therm Savings by Date of Application Submission*

## 1.2 Overview of Evaluation Approach

The overall objective for the impact evaluation of the Custom and Standard Incentives Programs and New Construction Program was to determine the gross and net electric and natural gas savings and peak demand (kW) reductions resulting from projects completed during the period June 2011 through May 2012.

The approach for the impact evaluation had the following main features.

- Available documentation (e.g., audit reports, savings calculation work papers, etc.) was reviewed for a sample of projects, with particular attention given to the calculation procedures and documentation for savings estimates.
- On-site data collection was conducted for a sample of projects to provide the information needed for estimating savings and demand reductions. Monitoring was also conducted at some sites to obtain more accurate information on the hours of operation for lighting, HVAC equipment, and motors/VFDs.
- Gross savings were estimated using proven techniques:
    - Analysis of lighting savings was accomplished using ADM's custom-designed lighting evaluation model with system parameters (fixture wattage, operating characteristics, etc.) based on information on operating parameters collected on-site and, if appropriate, industry standards.
    - For HVAC measures, the original analyses used to calculate the expected savings were reviewed and the operating and structural parameters of the analysis were verified. For custom measures or relatively more complex measures, simulations with the DOE-2 energy analysis model were used to develop estimates of energy use and savings from the installed measures.
- A participant survey was conducted from a sample of program participants to gather information on their decision making, their likes and dislikes of the program, and factors determining net-to-gross savings ratios for the program.

## 1.3 Organization of Report

This report on the impact and process evaluation of the Custom and Standard Incentives Programs and the New Construction Program for the period June 2011 through May 2012 is organized as follows:

- Chapter 2 presents and discusses the methods used for and the results obtained from estimating gross savings for measures installed under the Custom and Standard Incentives Programs and the New Construction Program.

- Chapter 3 presents and discusses the methods used for and results obtained from estimating net savings for the Custom and Standard Incentives Programs and the New Construction Program.
- Chapter 4 presents and discusses the methods used for and results obtained from the process evaluation of the Custom and Standard Incentives Programs and the New Construction Program.
- Chapter 5 presents evaluation conclusions and recommendations for the Custom and Standard Incentives Programs and the New Construction Program.
- Appendix A provides a copy of the questionnaire used for the survey of decision makers for participants in the Custom and Standard Incentives Programs.
- Appendix B presents the results from a survey of decision makers for participants that received incentives under the Custom and Standard Incentives Programs.
- Appendix C provides a copy of the questionnaire used for the survey of decision makers for participants in the New Construction Program.
- Appendix D presents the results from a survey of decision makers for participants that received incentives under the New Construction Program.

# 2. Estimation of Gross Savings

This chapter addresses the estimation of gross kWh and therm savings and peak kW reductions resulting from measures installed in facilities of participants that obtained custom or standard incentives under the Custom and Standard Incentives Programs, as well as participants in the New Construction Program, during the period June 2011 through May 2012. Section 2.1 describes the methodology used for estimating gross savings. Section 2.2 presents the results from the effort to estimate savings for a sample of custom and standard incentives projects, as well as a sample of new construction projects.

## 2.1 Methodology for Estimating Gross Savings

The methodology used for estimating gross savings for the Custom and Standard Incentives Programs and the New Construction Program is described in this section.

### 2.1.1 Sampling Plan

Data used to estimate the gross savings achieved through the custom and standard components of the Custom and Standard Incentives Programs were collected for samples of projects completed during the period June 2011 through May 2012. Data provided by the DCEO showed that during the period June 2011 through May 2012, there were 400 Custom Incentives Program projects, which were expected to provide savings of 59,793,548 kWh, and there were 1,168 Standard Incentives Program projects during the same period, which were expected to provide savings of 56,151,930 kWh annually. The New Construction Program was expected to provide savings of 1,901,685 kWh.

Inspection of data on kWh savings for individual projects provided by implementation contractor indicated that the distribution of savings was generally positively skewed, with a relatively small number of projects accounting for a high percentage of the estimated savings. Estimation of savings for each program component is based on a ratio estimation procedure, which allows precision/confidence requirements to be met with a smaller sample size. For the Custom Incentives Program sample, the actual precision is ±10.0% at 90% confidence, while for the Standard Incentives Program sample, the actual precision is ±10.0% at 90% confidence.

Sampling for the collection of program M&V data accounted for the M&V effort occurring in real time during program implementation. Completed projects accumulate over time as the program is implemented, and sample selection was thus spread over the entire program year. ADM used a near real-time process whereby a portion of the sample was selected periodically as projects in the program were completed. The timing of sample selection was contingent upon the timing of the completion of projects during the program year.

Table 2-1 shows the number of projects and expected kWh savings of the Custom Incentives Program sample by stratum. Table 2-2 shows the number of projects and expected kWh savings of the Standard Incentives Program sample by stratum.

*Table 2-1 Population Statistics Used for Sample Design for Custom Incentives Component kWh Savings*

| | *Stratum 1* | *Stratum 2* | *Stratum 3* | *Stratum 4* | *Totals* |
|---|---|---|---|---|---|
| Strata boundaries (kWh) | < 80,740 | 80,740 – 266,219 | 266,220 – 1,167,359 | >1,167,360 | |
| Number of projects | 324 | 39 | 24 | 13 | 400 |
| Total kWh savings | 5,806,906 | 5,041,770 | 8,935,227 | 40,009,645 | 59,792,548 |
| Average kWh Savings | 17,923 | 129,276 | 372,301 | 3,077,665 | 149,484 |
| Standard deviation of kWh savings | 18,384 | 46,409 | 64,267 | 1,850,236 | 632,549 |
| Coefficient of variation | 1.03 | 0.36 | 0.17 | 0.60 | 4.23 |
| Final design sample | 3 | 7 | 3 | 13 | 26 |

*Table 2-2 Population Statistics Used for Sample Design for Standard Incentives Program kWh Savings*

| | *Stratum 1* | *Stratum 2* | *Stratum 3* | *Stratum 4* | *Stratum 5* | *Totals* |
|---|---|---|---|---|---|---|
| Strata boundaries (kWh) | < 20070 | 20070 - 46319 | 46320 - 141579 | 141580 - 528879 | > 528880 | |
| Number of projects | 634 | 279 | 201 | 41 | 13 | 1,168 |
| Total kWh savings | 4,968,319 | 8,835,459 | 15,347,163 | 8,946,575 | 18,054,414 | 56,151,930 |
| Average kWh Savings | 7,836 | 31,668 | 76,354 | 218,209 | 1,388,801 | 48,075 |
| Standard deviation of kWh savings | 5,499 | 7,650 | 23,369 | 76,159 | 1,255,035 | 196,576 |
| Coefficient of variation | 0.70 | 0.24 | 0.31 | 0.35 | 0.90 | 4.09 |
| Final design sample | 4 | 2 | 6 | 3 | 13 | 28 |

As shown in Table 2-3, the sample projects account for approximately 68% of Custom Incentives Program's expected kWh savings, while, as shown in Table 2-4, the Standard Incentives Program's sample projects account for approximately 35% of standard incentive expected kWh savings.

*Table 2-3 Expected kWh Savings for Custom Incentives Sampled Projects by Stratum*

| *Stratum* | *Sample Expected Savings* | *Total Expected Savings* | *Percent of Ex Ante kWh Savings in Sample* |
|---|---|---|---|
| 4 | 38,842,287 | 40,009,645 | 97% |
| 3 | 1,031,292 | 8,935,227 | 12% |
| 2 | 823,416 | 5,041,770 | 16% |
| 1 | 159,455 | 5,806,906 | 3% |
| Total | 40,856,450 | 59,793,548 | 68% |

*Table 2-4 Expected kWh Savings for Standard Incentives Sampled Projects by Stratum*

| *Stratum* | *Sample Expected Savings* | *Total Expected Savings* | *Percent of Ex Ante kWh Savings in Sample* |
|---|---|---|---|
| 5 | 18,054,414 | 18,054,414 | 100% |
| 4 | 855,298 | 8,946,575 | 10% |
| 3 | 378,641 | 15,347,163 | 2% |
| 2 | 89,024 | 8,835,459 | 1% |
| 1 | 52,988 | 4,968,319 | 1% |
| Total | 19,430,365 | 56,151,930 | 35% |

Data used to estimate the gross savings achieved through the custom and standard components of the Custom and Standard Incentives Programs were collected for samples of projects completed during the period June 2011 through May 2012. Data provided by the DCEO showed that during the period June 2011 through May 2012, there were 69 Custom Incentives Program projects, which were expected to provide savings of 2,317,745 therms. There was no sample for Standard Incentives Program because an engineering desk review was implemented for all measures. The New Construction Program was expected to provide therm savings of 12,710.

Inspection of data on kWh savings for individual projects provided by implementation contractor indicated that the distribution of savings was generally positively skewed, with a relatively small number of projects accounting for a high percentage of the estimated savings. Estimation of savings for each program component is based on a ratio estimation procedure, which allows precision/confidence requirements to be met with a smaller sample size. For the Custom Incentives Program sample, the actual precision is ±11.0%.

Table 2.5 shows the number of projects and expected therm savings of the Custom Incentives Program sample by stratum.

*Table 2-5 Population Statistics Used for Sample Design for Custom Incentives Component Therm Savings*

| | *Stratum 1* | *Stratum 2* | *Stratum 3* | *Totals* |
|---|---|---|---|---|
| Strata boundaries (Therm) | < 30830 | 30830 - 130979 | > 130980 | |
| Number of projects | 55 | 11 | 3 | 69 |
| Total kWh savings | 485,716 | 522,085 | 1,309,944 | 2,317,745 |
| Average kWh Savings | 8,831 | 47,462 | 436,648 | 69 |
| Standard deviation of kWh savings | 8,843 | 17,434 | 313,733 | 33,591 |
| Coefficient of variation | 1.00 | 0.37 | 0.72 | 3.08 |
| Final design sample | 9 | 9 | 3 | 21 |

As shown in Table 2-6 the sample projects account for approximately 83% of Custom Incentives Program's expected kWh savings

*Table 2-6 Expected Therm Savings for Custom Incentives Sampled Projects by Stratum*

| *Stratum* | *Sample Expected Savings* | *Total Expected Savings* | *Percent of Ex Ante Therm Savings in Sample* |
|---|---|---|---|
| 3 | 1,309,944 | 1,309,944 | 100% |
| 2 | 400,189 | 522,085 | 77% |
| 1 | 211,042 | 485,716 | 43% |
| Total | 1,921,175 | 2,317,745 | 83% |

An engineering desk review of all standard incentive natural gas measures was performed. This constitutes a census, and so there is no sampling plan for this segment of program activity.

### 2.1.2 Review of Documentation

After the samples of projects were selected, DCEO provided documentation pertaining to the projects. The first step in the evaluation effort was to review this documentation and other program materials that were relevant to the evaluation effort.

For each project, the available documentation (e.g., audit reports, savings calculation work papers, etc.) for each rebated measure was reviewed, with particular attention given to the calculation procedures and documentation for savings estimates. Documentation that was reviewed for all projects selected for the sample included program forms, data bases, reports, billing system data, weather data, and any other potentially useful data. Each application was reviewed to determine whether the following types of information had been provided:

- Documentation for the equipment changed, including (1) descriptions, (2) schematics, (3) performance data, and (4) other supporting information

- Documentation for the new equipment installed, including (1) descriptions, (2) schematics, (3) performance data, and (4) other supporting information

- Information about the savings calculation methodology, including (1) what methodology was used, (2) specifications of assumptions and sources for these specifications, and (3) correctness of calculations

If there was uncertainty regarding a project, or apparently incomplete project documentation, ADM staff contacted the DCEO to seek further information to ensure the development of an appropriate project-specific M&V plan.

### 2.1.3 On-Site Data Collection Procedures

On-site visits were used to collect data that were used in calculating savings impacts. The visits to the sites of the sampled projects were used to collect primary data on the facilities participating in the program.

When projects were selected for the M&V sample, ADM provided DCEO Energy Efficiency staff with a list of projects for which ADM planned to schedule M&V activities. This notification also served as a request for any documentation relating to the projects. This list included the company name, the project ID, the site address or other premise identification, and the respective contact information for the particpant representative ADM intended to contact in order to schedule an appointment.

During an on-site visit, the field staff accomplished three major tasks:

- First, they verified the implementation status of all measures for which participants received incentives. They verified that the energy efficiency measures were indeed installed, that they were installed correctly and that they still functioned properly.

- Second, they collected the physical data needed to analyze the energy savings that have been realized from the installed improvements and measures. Data were collected using a form that was prepared specifically for the project in question after an in-house review of the project file.

- Third, they interviewed the contact personnel at a facility to obtain additional information on the installed system to complement the data collected from other sources.

At some sites, monitoring was conducted to gather more information on the operating hours of the installed measures. Monitoring was conducted at sites where it was judged that the monitored data would be useful for further refinement and higher accuracy of savings calculations. Monitoring was not considered necessary for sites where project documentation allowed for sufficiently detailed calculations.

### 2.1.4 Procedures for Estimating Savings from Measures Installed

The method ADM employs to determine gross savings impacts depends on the types of measures being analyzed. Categories of measures include the following:

- Lighting
- HVAC
- Motors
- VFDs
- Compressed-Air
- Refrigeration
- Process Improvements

ADM uses a specific set of methods to determine gross savings for projects that depend on the type of measure being analyzed. These typical methods are summarized in Table 2-7.

*Table 2-7 Typical Methods to Determine Savings for Measures*

| *Type of Measure* | *Method to Determine Savings* |
|---|---|
| Compressed Air Systems | Engineering analysis, with monitored data on load factor and schedule of operation |
| Lighting | Custom-designed lighting evaluation model, which uses data on wattages before and after installation of measures and hours-of-use data from field monitoring. |
| HVAC (including packaged units, chillers, cooling towers, controls/EMS) | eQUEST model using DOE-2 as its analytical engine for estimating HVAC loads and calibrated with site-level billing data to establish a benchmark. |
| Motors and VFDs | Measurements of power and run-time obtained through monitoring |
| Refrigeration | Simulations with EQuest engineering analysis model, with monitored data |
| Process Improvements | Engineering analysis, with monitored data on load factor and schedule of operation |

The activities specified in Table 2-7 produced two estimates of gross savings for each sample project: an expected gross savings estimate (as reported in the project documentation and program tracking system) and the verified gross savings estimates developed through the M&V procedures employed by ADM. ADM developed estimates of program component-level gross savings by applying a ratio estimation procedure in which achieved savings rates estimated for the sample projects were applied to the program component-level expected savings.

Energy savings realization rates[2] were calculated for each project for which on-site data collection and engineering analysis/building simulations were conducted. Sites with relatively high or low realization rates were further analyzed to determine the reasons for the discrepancy between expected and realized energy savings.

The following discussion describes the basic procedures used for estimating savings from various measure types.

**Plan for Analyzing Savings from Lighting Measures:** Lighting measures examined include retrofits of existing fixtures, lamps and/or ballasts with energy efficient fixtures, lamps and/or ballasts. These types of measures reduce demand, while not affecting operating hours. Any proposed lighting control strategies that might include the addition of energy conserving control technologies such as motion sensors or daylighting controls are examined. These measures typically involve a reduction in hours of operation and/or lower current passing through the fixtures.

Analyzing the savings from such lighting measures requires data for retrofitted fixtures on (1) wattages before and after retrofit and (2) hours of operation before and after the retrofit. Fixture wattages are taken from a table of standard wattages, with corrections made for non-operating fixtures. Hours of operation are determined from metered data collected after measure installation for a sample of fixtures.

To determine baseline and post-retrofit demand values for the lighting efficiency measures, ADM uses in-house data on standard wattages of lighting fixtures and ballasts to determine demand values for lighting fixtures. These data provide information on wattages for common lamp and ballast combinations.

As noted, ADM collects data with which to determine average operating hours for retrofitted fixtures by using Time-of-Use (TOU) data loggers to monitor a sample of "last points of control" for unique usage areas in the sites where lighting efficiency measures have been installed. Usage areas are defined to be those areas within a facility that are expected to have comparable average operating hours. Typical usage areas are designated in the forms used for data collection.

ADM uses per-fixture baseline demand, retrofit demand, and appropriate post-retrofit operating hours to calculate peak capacity savings and annual energy savings for sampled fixtures of each usage type.

Peak kW reduction was calculated for projects that are part of the sample for measurement and verification. In order to calculate total achieved peak kW savings , the total realized peak kW

[2] The savings realization rate for a project is calculated as the ratio of the achieved savings for the project (as measured and verified through the M&V effort) to the expected savings (as determined through the project application procedure and recorded in the tracking system for the program).

savings for the sampled projects of a stratum were factored by the ratio of *total* expected kWh savings to *sample* expected kWh savings.

Peak Period Demand Savings are calculated as the difference between peak period baseline demand and post-installation peak period demand of the affected lighting equipment, per the following formula:

$$\text{Peak Capacity Savings} = kW_{before} - kW_{after}$$

The baseline and post-installation average demands are calculated by dividing the total kWh usage during the Peak Period by the number of hours in the Peak Period.

ADM calculates annual energy savings for each sampled fixture per the following formula:

$$\text{Annual Energy Savings} = kWh_{before} - kWh_{after}$$

The values for insertion in this formula are determined through the following steps:

- Results from the monitored sample are used to calculate the average operating hours of the metered lights in each costing period for every unique building type/usage area.
- These average operating hours are then applied to the baseline and post-installation average demand for each usage area to calculate the respective energy usage and peak period demand for each usage area.
- The annual baseline energy usage is the sum of the baseline kWh for each costing period for all of the usage areas. The post-retrofit energy usage is calculated similarly. The energy savings are calculated as the difference between baseline and post-installation energy usage.
- Savings from lighting measures in conditioned spaces are factored by the region-specific, building type-specific heating cooling interaction factors in order to calculate total savings attributable to lighting measures, inclusive of impacts on HVAC operation

**Plan for Analyzing Savings from HVAC Measures:** Savings estimates for HVAC measures installed at a facility are derived by using the energy use estimates developed through DOE-2 simulations and engineering calculations. The HVAC simulations also allow calculation of the primary and secondary effects of lighting measures on energy use. Each simulation produces estimates of HVAC energy and demand usage to be expected under different assumptions about equipment and/or construction conditions. There may be cases in which DOE-2 simulation is inappropriate because data are not available to properly calibrate a simulation model, and engineering analysis provides more accurate M&V results.

For the analysis of HVAC measures, the data collected through on-site visits and monitoring are utilized. Using these data, ADM prepares estimates of the energy savings for the energy efficient equipment and measures installed in each of the participant facilities. Engineering staff

develop independent estimates of the savings through engineering calculations or through simulations with energy analysis models. By using energy simulations for the analysis, the energy use associated with the end use affected by the measure(s) being analyzed can be quantified. With these quantities in hand, it is a simple matter to determine what the energy use would have been without the measure(s).

Before making the analytical runs for each site with sampled project HVAC measures, engineering staff prepare a model calibration run. This is a base case simulation to ensure that the energy use estimates from the simulations have been reconciled against actual data on the building's energy use. This run is based on the information collected in an on-site visit pertaining to types of equipment, their efficiencies and capacities, and their operating profiles. Current operating schedules are used for this simulation, as are local (TMY) weather data covering the study period. The model calibration run is made using actual weather data for a time period corresponding to the available billing data for the site.

The goal of the model calibration effort is to have the results of the DOE-2 simulation come within approximately 10% of the patterns and magnitude of the energy use observed in the billing data history. In some cases, it may not be possible to achieve this calibration goal because of idiosyncrasies of particular facilities (e.g., multiple buildings, discontinuous occupancy patterns, etc.).

Once the analysis model has been calibrated for a particular facility, ADM performs three steps in calculating estimates of energy savings for HVAC measures installed or to be installed at the facility.

- First, an analysis of energy use at a facility under the assumption that the energy efficiency measures are not installed is performed.
- Second, energy use at the facility with all conditions the same but with the energy efficiency measures now installed is analyzed.
- Third, the results of the analyses from the preceding steps are compared to determine the energy savings attributable to the energy efficiency measure.

**Plan for Analyzing Savings from Motors:** Estimates of the energy savings from use of high efficiency motors on HVAC and non-HVAC applications are derived through an "after-only" analysis. With this method, energy use is measured only for the high efficiency motor and only after it has been installed. The data thus collected are then used in estimating what energy use would have been for the motor application *if the high efficiency motor had not been installed.* In effect, the after-only analysis is a reversal of the usual design calculation used to estimate the savings that would result from installing a high efficiency motor. That is, at the design stage, the question addressed is how would energy use change for an application if an high efficiency motor is installed, whereas the after-only analysis addresses what the level of energy use would have been had the high efficiency motor not been installed.

For the "after only" analysis, it is not possible to use a comparison of direct measurements to determine savings, since measured data are collected only for the high efficiency motor. However, savings attributable to installation of the high efficiency motor can be estimated using information on the efficiencies of the high efficiency motor and on the motor it replaced. In particular, demand and energy savings can be calculated as follows:

$$\text{Demand Savings} = kW_{peak} \times (1/Eff_{old} - 1/Eff_{new})$$

where $kW_{peak}$ = Volts x $Amps_{peak}$ x Power Factor, and $Amps_{peak}$ is the interval with the maximum recorded Amps during the monitoring period

$$\text{Energy Savings} = kW_{ave} \times (1/Eff_{old} - 1/Eff_{new}) \times \text{Hours of use}$$

where $kW_{ave}$ = Volts x $Amps_{ave}$ x Power Factor and $Amps_{ave}$ is the average measured Amps for the duration of the monitored period.

$$\text{Annual Energy Savings} = kW_{ave} \times (1/Eff_{old} - 1/Eff_{new}) \times (\text{days of operation per year/ days metered}) \times \text{Annual Adjustment Factor}$$

where $kW_{ave}$ = Volts x $Amps_{ave}$ x Power Factor for the monitoring period, $Amps_{ave}$ is the average measured Amps for the duration of the monitored period, and use factor is determined from interviews with site personnel. Annual Adjustment Factor is 1 if the monitoring period is typical for the yearly operation, less than 1 if the monitoring period is expected to be higher use than typical for the rest of the year, and more than 1 if the monitoring period is expected to be lower than typical for the rest of the year.[3]

The information on motor efficiencies needed for the calculation of savings is obtained from different sources.

Data on the efficiencies of high efficiency motors installed under the program should be available from program records.

In some cases, the efficiencies of the replaced motors may also be noted in DCEO's program records. Care must be taken using nameplate efficiency ratings of replaced motors, unless the company maintains good documentation of their equipment. If a motor has been rewound it may not operate as originally rated. However, if the efficiencies of the old motors are not directly available, the efficiency values can be imputed by using published data on average efficiency values for motors of given horsepower. If the motor replacement is for normal replacement, the baseline efficiency is established as the efficiency of a new, standard efficiency motor. However,

[3] Current year weather data were compared with the *Typical Meteorological Year* from the National Oceanic & Atmospheric Administration (NOAA)

in cases of early replacement, the efficiency of the old motor is used for the length of the remaining life. [4]

Because most motors monitored run only under full load conditions, some adjustments must be made from the "industry averages" of full load efficiencies. Motor efficiency curves of typical real motors that have the same full load efficiencies are used for determining part load efficiencies.

Like motor efficiency, the power factor varies with motor loading. Motor power factor curves of typical real motors that have the same full load power factor are used for determining part load power factor.

Another factor to consider in demand and energy savings comparisons of motor change out programs is the rotor slip. Full load RPM ratings of motors vary. For centrifugal loads such as fans and pumps, the power supplied is dependent on the speed of the driven equipment. The power is theoretically proportional to the cube of the speed, but in practice more closely approximates the square of the speed. In general high efficiency motors have slightly higher full load RPM ratings (lower slip) than standard motors. Where nameplate ratings of full load RPM are available for replaced motors, a derating factor can be applied.[5]

The data needed to carry out these plans for determining savings are collected from several sources.

- The first source of data is the information from each project's documentation. This information is expected to include aggregate energy used at a site, disaggregated energy usage data for certain targeted processes (if available), before (actual) and after (projected) data on production, scrap, and other key performance indicators, and final reports (which include process improvement recommendations, analyses, conclusions, performance targets, etc.).

- The second source of data is energy use obtained from utilities.

- The third source is information collected through on-site inspections of the facilities. ADM staff collect the data during on-site visits using a form that is comprehensive in addressing a facility's characteristics, its modes and schedules of operation, and its electrical and mechanical systems. The form also addresses various energy efficiency measures, including high efficiency lighting (both lamps and ballasts), lighting occupancy sensors, lighting dimmers and controls, air conditioning, high efficiency motors, etc.

[4] Assumptions regarding measure expected useful life were taken from the most recent Database for Energy Efficiency Resources (DEER). See http://www.deeresources.com/.

[5] As an example, take the case where a new motor has a full load RPM rating of 1770 and the old motor had a full load RPM rating of 1760. The derating factor would be:

Derating factor = $(RPM_{old})^2 / (RPM_{new})^2 = 1760^2 / 1770^2 = 0.989$

- As a fourth source of data, selected end-use equipment are monitored to develop information on operating schedules and power draws.

**Plan for Analyzing Savings from VFDs:** A variable-frequency drive (VFD) is an electronic device that controls the speed of a motor by varying the magnitude of the voltage, current, or frequency of the electric power supplied to the motor. The factors that make a motor load a suitable application for a VFD are (1) variable speed requirements and (2) high annual operating hours. The interplay of these two factors can be summarized by information on the motor's duty cycle, which essentially shows the percentage of time during the year that the motor operates at different speeds. The duty cycle should show good variability in speed requirements, with the motor operating at reduced speed a high percentage of the time.

Potential energy savings from the use of VFDs are usually most significant with variable-torque loads, which have been estimated to account for 50% to 60% of total motor energy use in the non-residential sectors. Energy saving VFDs may be found on fans, centrifugal pumps, centrifugal blowers, and other centrifugal loads, most usually where the duty cycle of the process provided a wide range of speeds of operation.

ADM's approach to determining savings from installation of VFDs involves (1) making one-time measurements of voltage, current, and power factor of the VFD/motor and (2) conducting continuous measurements of amperage over a period of time in order to obtain the data needed to develop VFD load profiles and calculate demand and energy savings. VFDs are generally used in applications where motor loading changes when motor speed changes. Consequently the true power drawn by a VFD is recorded in order to develop VFD load shapes. One-time measurements of power are made for different percent speed settings. Power and percent speed or frequency (depending on VFD display options) are recorded for as wide a range of speeds as the participant allows the process to be controlled; field staff attempt to obtain readings from 40 to 100% speed in 10 to 15% increments.

**Plan for Analyzing Savings from Compressed Air Measures:** Measures to improve the efficiency of a compressed air system include the reduction of air leaks, resizing of compressors, installing more efficient compressors, improved controls, or a complete system redesign. Savings from such measures are evaluated through engineering analysis of compressor performance curves, supported by data collected through short-term metering.

ADM field staff obtain nameplate information for the pre-retrofit equipment either from the project file or during the on-site survey. Performance curve data are obtained from manufacturers. Engineering staff then conduct an engineering analysis of the performance characteristics of the pre-retrofit equipment. During the on-site survey, field staff inspect the as-built system equipment, take pressure and load readings, and interview the system operator to identify seasonal variations in load. Potential interactions with other compressors are assessed and it is verified that the rebated compressor is being operated as intended.

When appropriate, short-term measurements are performed to reduce the uncertainty in defining the load on the as-built system. These measurements may be taken either with a multi-channel logger, which can record true power for several compressors, with current loggers, which can provide average amperage values, or with motor loggers to record operating hours. The appropriate metering equipment is selected by taking into account variability in load and the cost of conducting the monitoring.

ADM used AirMaster+ to calculate the savings due to the energy efficiency measures installed within each compressed air system. The AirMaster+ as-built and baseline compressor types were inputted into the model using data points collected during on-site verification. The as-built model was then calibrated to a typical daily schedule, derived from at least two weeks of trending data. Project energy savings were calculated by subtracting the as-built from the baseline energy consumption.

**Plan for Analyzing Savings from Refrigeration and Process Improvements:** Analysis of savings from refrigeration and process improvements is inherently project-specific. Because of the specificity of processes, analyzing the processes through simulations is generally not feasible. Rather, reliance is made on engineering analysis of the process affected by the improvements. Major factors in ADM's engineering analysis of process savings are operating schedules and load factors. Information on these factors is developed through short-term monitoring of the affected equipment, be it pumps, heaters, compressors, etc. The monitoring is done after the process change, and the data gathered on operating hours and load factors are used in the engineering analysis to define "before" conditions for the analysis of savings.

## 2.2 Results of Gross Savings Estimation

To estimate gross therm savings, gross kWh savings, and peak kW reductions for the custom and standard components of the program, data were collected and analyzed for samples of 26 Custom Incentives Program projects and 28 Standard Incentives Program projects. The data were analyzed using the methods described in Section 2.1 to estimate project energy savings and peak kW reductions and to determine realization rates for both program components. The results of that analysis are reported in this section.

### 2.2.1 Realized Gross kWh and Therm Savings

The gross kWh savings of the Custom Incentives Program during the period June 2011 through May 2012 are summarized by sampling stratum in Table 2-8. Overall, the achieved gross savings of 57,254,082 kWh were equal to 96% of the expected savings. The gross kWh savings of the Standard Incentives Programs during the period June 2011 through May 2012 are summarized by sampling stratum in Table 2-9. Overall, the achieved gross savings of 66,357,365 kWh were equal to 118% of the expected savings.

*Table 2-8 Expected and Gross Realized kWh Savings for Custom Incentives Program by Sample Stratum*

| *Stratum* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Gross Realization Rate* |
|---|---|---|---|
| 4 | 40,009,645 | 37,407,653 | 93% |
| 3 | 8,935,227 | 12,380,337 | 139% |
| 2 | 5,041,770 | 1,145,630 | 23% |
| 1 | 5,806,906 | 6,320,462 | 109% |
| Total | 59,793,548 | 57,254,082 | 96% |

*Table 2-9 Expected and Gross Realized kWh Savings for Standard Incentives Program by Sample Stratum*

| *Stratum* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Gross Realization Rate* |
|---|---|---|---|
| 5 | 18,054,414 | 21,372,858 | 118% |
| 4 | 8,946,575 | 8,743,254 | 98% |
| 3 | 15,347,163 | 23,375,981 | 152% |
| 2 | 8,835,459 | 7,862,444 | 89% |
| 1 | 4,968,319 | 5,002,827 | 101% |
| Total | 56,151,930 | 66,357,365 | 118% |

Table 2-10 shows the expected and realized kWh energy savings by project for the Custom Incentives Program. Table 2-11 shows the expected and realized kWh energy savings by project for the Standard Incentives Program.

*Table 2-10 Expected and Gross Realized kWh Savings for Custom Incentives Program by Project*

| *Project ID* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *kWh Gross Realization Rate* |
|---|---|---|---|
| CE-1 | 2,114,241 | 1,931,094 | 91% |
| CE-2 | 2,840,140 | 2,239,759 | 79% |
| CE-3 | 1,216,287 | 941,131 | 77% |
| CE-4 | 3,348,007 | 3,941,801 | 118% |
| CE-5 | 3,550,839 | 4,180,606 | 118% |
| CE-6 | 1,322,000 | 1,819,210 | 138% |
| CE-7 | 3,269,232 | 1,723,830 | 53% |
| CE-8 | 6,314,500 | 5,129,278 | 81% |
| CE-9 | 1,473,534 | 882,204 | 60% |
| CE-10 | 6,523,467 | 5,959,310 | 91% |
| CE-11 | 4,915,992 | 5,053,749 | 103% |
| CE-12 | 1,954,048 | 2,514,241 | 129% |
| CE-13 | 266,215 | 517,120 | 194% |
| CE-14 | 498,078 | 649,670 | 130% |
| CE-15 | 266,999 | 262,132 | 98% |

| *Project ID* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *kWh Gross Realization Rate* |
|---|---|---|---|
| CE-16 | 122,620 | 111,996 | 91% |
| CE-17 | 97,402 | (73,823) | -76% |
| CE-18 | 98,614 | (86,259) | -87% |
| CE-19 | 119,194 | 77,077 | 65% |
| CE-20 | 94,264 | 13,166 | 14% |
| CE-21 | 201,862 | 67,267 | 33% |
| CE-22 | 89,460 | 77,679 | 87% |
| CE-23 | 73,112 | 86,812 | 119% |
| CE-24 | 77,802 | 76,093 | 98% |
| CE-25 | 8,541 | 10,652 | 125% |
| All Non-Sample Projects | 18,937,098 | 19,148,287 | 101% |
| Total | 59,793,548 | 57,254,082 | 96% |

*Table 2-11 Expected and Gross Realized kWh Savings for Standard Incentives Program by Project*

| *Project ID* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Project Gross Realization Rate* |
|---|---|---|---|
| SE-1 | 677,964 | 2,188,094 | 323% |
| SE-2 | 1,339,948 | 3,554,144 | 265% |
| SE-3 | 4,002,567 | 3,876,704 | 97% |
| SE-4 | 926,256 | 814,686 | 88% |
| SE-5 | 3,511,954 | 3,387,516 | 96% |
| SE-6 | 3,092,247 | 3,407,496 | 110% |
| SE-7 | 548,104 | 693,142 | 126% |
| SE-8 | 672,466 | 649,563 | 97% |
| SE-9 | 747,665 | 512,683 | 69% |
| SE-10 | 528,881 | 544,529 | 103% |
| SE-11 | 605,506 | 461,008 | 76% |
| SE-12 | 642,346 | 655,662 | 102% |
| SE-13 | 758,510 | 627,630 | 83% |
| SE-14 | 210,064 | 196,629 | 94% |
| SE-15 | 381,626 | 409,491 | 107% |
| SE-16 | 263,607 | 229,740 | 87% |
| SE-17 | 84,299 | 58,715 | 70% |
| SE-18 | 46,317 | 41,647 | 90% |
| SE-19 | 74,249 | 42,219 | 57% |
| SE-20 | 79,977 | 376,245 | 470% |
| SE-21 | 46,394 | 10,495 | 23% |
| SE-22 | 47,404 | 47,404 | 100% |
| SE-23 | 45,311 | 53,920 | 119% |
| SE-24 | 43,712 | 25,300 | 58% |
| SE-25 | 7,768 | 7,768 | 100% |
| SE-26 | 16,565 | 14,680 | 89% |
| SE-27 | 18,155 | 13,115 | 72% |

| *Project ID* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Project Gross Realization Rate* |
|---|---|---|---|
| SE-28 | 10,500 | 17,793 | 169% |
| All Non-Sample Projects | 36,721,565 | 43,439,345 | 118% |
| Total | 56,151,930 | 66,357,365 | 118% |

The gross therm savings of the Custom Incentives Program during the period June 2011 through May 2012 are summarized by sampling stratum in Table 2-12. Overall, the achieved gross savings of 2,535,123 kWh were equal to 109% of the expected savings.

*Table 2-12 Expected and Gross Realized Therm Savings for Custom Incentives Program by Sample Stratum*

| *Stratum* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Gross Realization Rate* |
|---|---|---|---|
| 3 | 1,309,944 | 2,087,483 | 159% |
| 2 | 522,085 | 229,001 | 44% |
| 1 | 485,716 | 218,639 | 45% |
| Total | 2,317,745 | 2,535,123 | 109% |

Table 2-13 shows the expected and realized therm savings by project for the Custom Incentives Program.

*Table 2-13 Expected and Gross Realized Therm Savings for Custom Incentives Program by Project*

| *Project ID* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Project Gross Realization Rate* |
|---|---|---|---|
| CNG-1 | 26,665 | 7,579 | 28% |
| CNG-2 | 28,623 | 13,795 | 48% |
| CNG-3 | 23,218 | 17,618 | 76% |
| CNG-4 | 28,973 | 21,625 | 75% |
| CNG-5 | 27,552 | 7,032 | 26% |
| CNG-6 | 15,824 | 6,615 | 42% |
| CNG-7 | 30,143 | 9,144 | 30% |
| CNG-8 | 29,160 | 10,027 | 34% |
| CNG-9 | 884 | 1,563 | 177% |
| CNG-10 | 65,429 | 54,940 | 84% |
| CNG-11 | 35,454 | 20,341 | 57% |
| CNG-12 | 45,762 | - | 0% |
| CNG-13 | 45,758 | 45,758 | 100% |
| CNG-14 | 45,591 | 10,554 | 23% |
| CNG-15 | 35,925 | 10,310 | 29% |
| CNG-16 | 33,614 | 6,763 | 20% |
| CNG-17 | 40,956 | 14,778 | 36% |

| *Project ID* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Project Gross Realization Rate* |
|---|---|---|---|
| CNG-18 | 51,700 | 12,090 | 23% |
| CNG-19 | 421,092 | 533,775 | 127% |
| CNG-20 | 130,982 | 102,422 | 78% |
| CNG-21 | 757,870 | 1,451,286 | 191% |
| All Non-Sample Projects | 396,570 | 177,108 | 45% |
| Total | 2,317,745 | 2,535,123 | 109% |

ADM performed a desk review of each standard application with ex ante natural gas savings. The desk review entailed comparison of program applications and corresponding equipment specifications to ensure claimed measures were reported accurately. Standard natural gas savings were calculated using the methods set forth by the Illinois Statewide Technical Reference Manual. Table 2-14 summarizes the TRM measure number that was used to calculate the ex post savings for each measure category.

*Table 2-14 Appropriate TRM Measure Number*

| *Measure Category* | *Size Category* | *Efficiency* | *TRM Measure Number* |
|---|---|---|---|
| Gas Water Heater Tanked | ≥ 75 kBtuh input<br>≥ 50 gallon capacity | Energy Factor ≥ 0.65 | 4.3.1 |
| Gas Water Heater Tanked Condensing | ≥ 75 kBtuh input<br>≥ 50 gallon capacity | Energy Factor ≥ 0.80 | 4.4.5 |
| Gas Water Heater Tankless | ≥ 5 GPM output @70°F temperature rise<br>≥ 50 gallon capacity | Energy Factor ≥ 0.82 | 4.3.4 |
| GH1-Natural Gas Furnace | All | AFUE ≥ 92% | 4.4.11 |
| GH2-Natural Gas Furnace | All | AFUE ≥ 94% | 4.4.11 |
| GH3-Natural Gas Furnace | All | AFUE ≥ 96% | 4.4.11 |
| GH5-Natural Gas Boilers | < 1,000,000 Btuh Condensing | AFUE ≥ 90% | 4.4.10 |
| GH6-Natural Gas Boilers | 1,000,000 Btuh to 5,000,000 Btuh | TE ≥ 90% | 4.4.10 |
| Low Flow Faucet Aerators Natural Gas Water Heater | N/A | N/A | 4.3.2 |
| Low Flow Pre-Rinse Spray Valve Natural Gas Water Heater | N/A | N/A | 4.2.11 |

Project-specific calculations were performed for each measure using the appropriate prescribed savings algorithm. These algorithms were informed using application documentation including manufacturer specifications in cases where capacities and efficiencies were required. The results of the analysis are shown in Table 2-15.

*Table 2-15 Standard Measure-Level Natural Gas Savings*

| *Measure Category* | *Units* | *Ex-Ante Therm Savings* | *Ex-Post Therm Savings* | *Realization Rate* |
|---|---|---|---|---|
| Gas Water Heater Tanked | 42 | 14,680 | 7,338 | 38% |

| *Measure Category* | *Units* | *Ex-Ante Therm Savings* | *Ex-Post Therm Savings* | *Realization Rate* |
|---|---|---|---|---|
| Gas Water Heater Tanked Condensing | 5 | 6,096 | 1,330 | 22% |
| Gas Water Heater Tankless | 4 | 4,476 | 733 | 16% |
| GH1-Natural Gas Furnace | 340 | 993 | 409 | 41% |
| GH2-Natural Gas Furnace | 2,228 | 7,597 | 3,904 | 51% |
| GH3-Natural Gas Furnace | 1,397 | 5,435 | 2,407 | 44% |
| GH5-Natural Gas Boilers | 8,397 | 19,817 | 18,460 | 93% |
| GH6-Natural Gas Boilers | 18,310 | 44,493 | 34,681 | 78% |
| Low Flow Faucet Aerators Natural Gas Water Heater | 18 | 1,389 | 186 | 13% |
| Low Flow Pre-Rinse Spray Valve Natural Gas Water Heater | 3 | 765 | 1,100 | 144% |
| Total | | 105,741 | 70,548 | 65% |

For the "Gas Water Heater Tanked" measure, each measure had ex ante savings of 349.5 therms per installation, regardless of the building type. According to the TRM, the only variable for this savings calculation is building type, with the greatest savings associated with installation at Lodging-Hotel facilities: 228 therms.

This type of overestimation was similar for "Low Flow Faucet Aerators" which also has a deemed savings dependent upon building type. This measure was only installed in high schools, for which the TRM deems savings of 10.33 therms per aerator, while the ex ante savings were 77.15 therms per aerator.

### 2.2.2 Discussion of Gross Savings Analysis

The project realization rates were reviewed to assess whether there were factors that were causing systematic differences in the realization rates.

For the Custom Incentives Program projects, sample project realization rates and expected kWh savings are plotted in Figure 2-1. There is not a strong association between realization rates and expected kWh savings. Figure 2-2 plots the custom incentive project realized energy savings against the expected energy savings for each sample point.

Similarly, for the Standard Incentives Program projects, sample project realization rates and expected kWh savings are plotted in Figure 2-3. There is not a strong association between realization rates and expected kWh savings. Figure 2-4 plots the standard incentive project realized energy savings against the expected energy savings for each sample point.

Case-by-case examination showed that project-specific factors were more likely to cause realized kWh savings to differ from expected savings. Project-specific factors include type of measure implemented, building type, facility operating schedule, and other parameters that may affect energy efficiency measure savings.

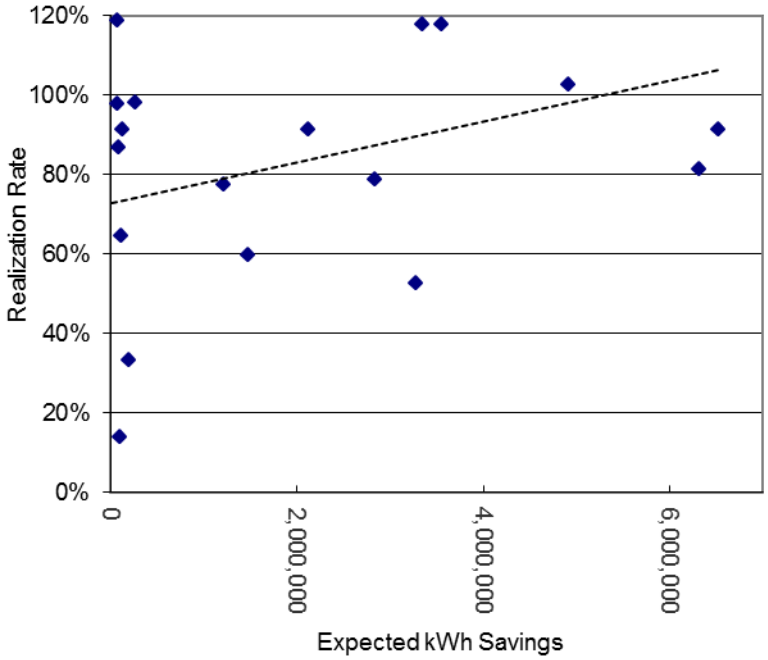


*Figure 2-1 Custom Incentives Program Sample Project Realization Rate versus Expected kWh Savings*

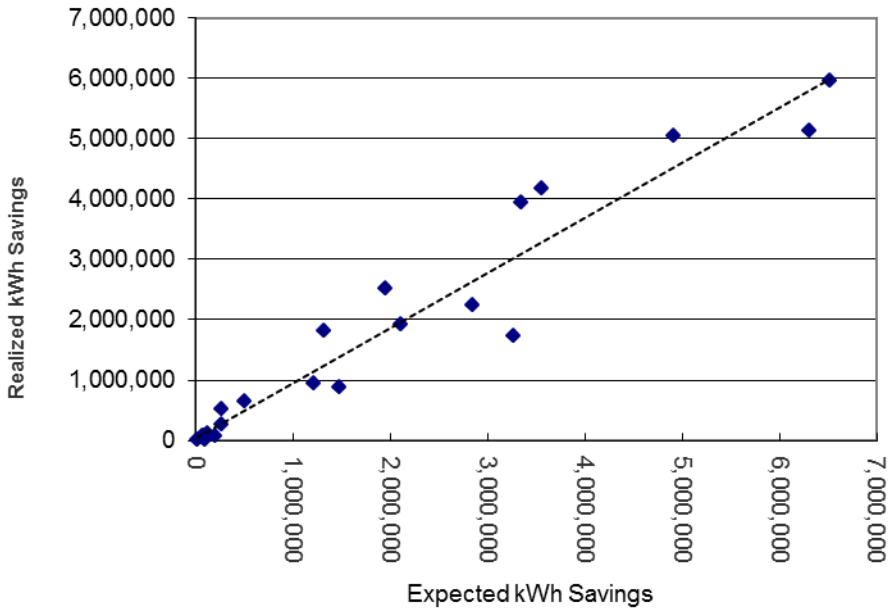


*Figure 2-2 Custom Incentives Program Sample Project Realized kWh Savings versus Expected kWh Savings*

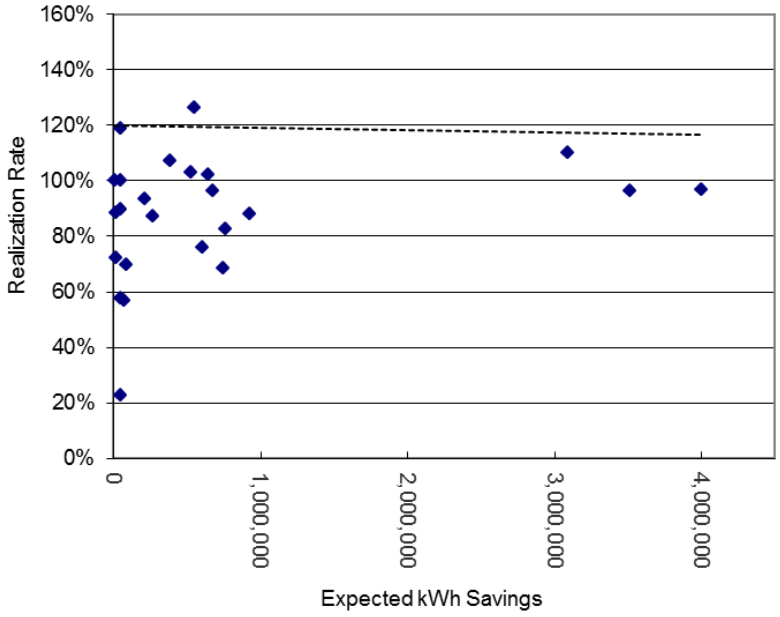


*Figure 2-3 Standard Incentives Program Sample Project Realization Rate versus Expected kWh Savings*

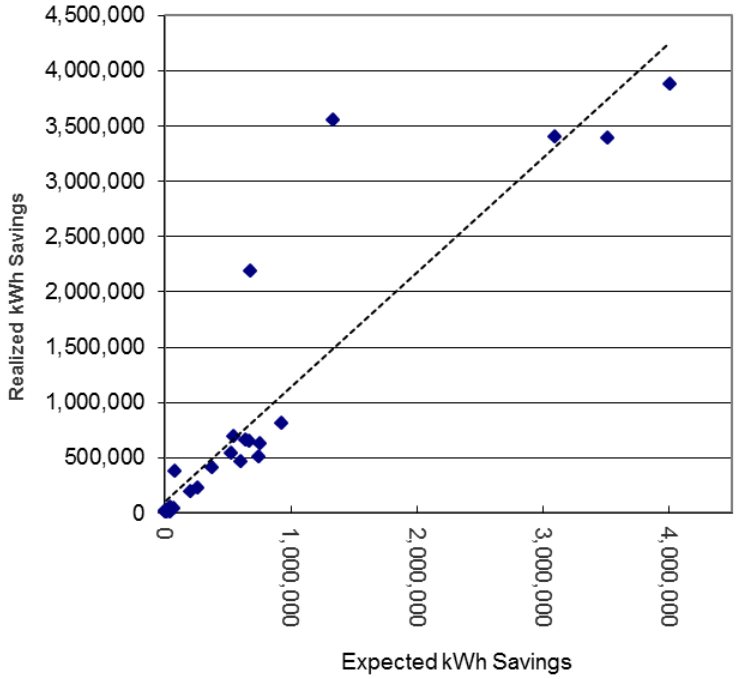


*Figure 2-4 Standard Incentives Program Sample Project Realized kWh Savings versus Expected kWh Savings*

Similarly, for the Custom Incentives Program projects, sample project realization rates and expected therm savings are plotted in Figure 2-5. There is not a strong association between realization rates and expected therm savings. Figure 2-6 plots the standard incentive project realized therm savings against the expected therm savings for each sample point.

Case-by-case examination showed that project-specific factors were more likely to cause realized kWh savings to differ from expected savings. Project-specific factors include type of measure implemented, building type, facility operating schedule, and other parameters that may affect energy efficiency measure savings.

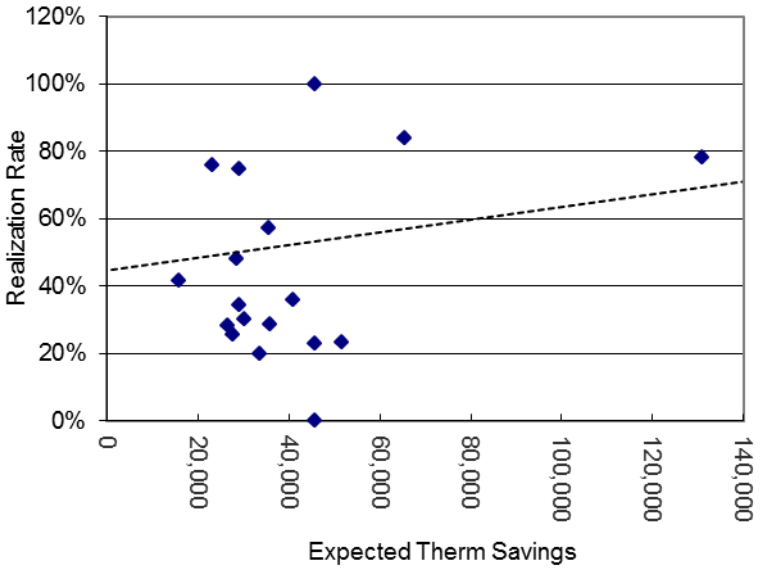


*Figure 2-5 Custom Incentives Program Sample Project Realization Rate versus Expected Therm Savings*

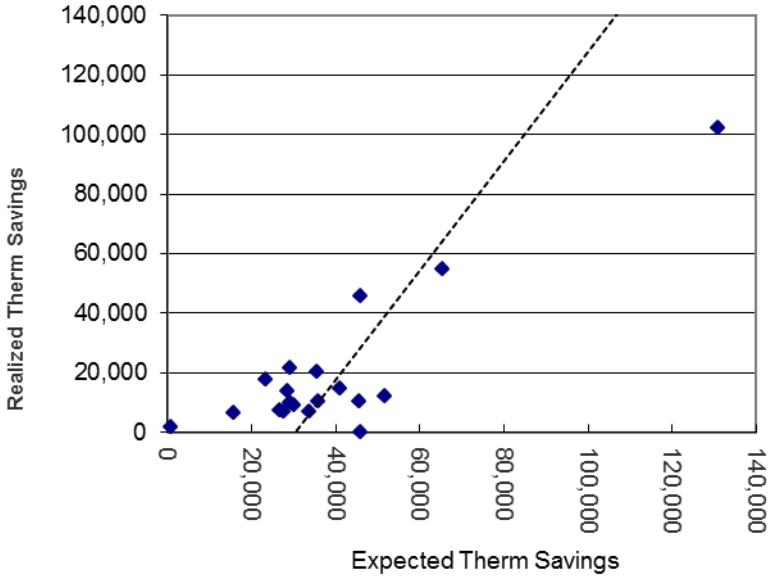


*Figure 2-6 Custom Incentives Program Sample Project Realized Therm Savings versus Expected Therm Savings*

# 3. Estimation of Net Savings

This chapter reports the results from estimating the net impacts of the Custom and Standard Incentives Programs, as well as the New Construction Program, during the period June 2011 through May 2012, where net savings represents the portion of gross savings achieved by program participants that can be attributed to the effects of the program.

## 3.1 Procedures Used To Estimate Net Savings

Net savings are defined as the portion of gross savings that can be attributed to the effects of the program. Net savings may be less than gross savings as a result of free ridership. Free riders of a program are defined as those participants that would have implemented the same energy efficiency measures and achieved the observed energy changes, even in the absence of the program.

In general, net savings can be considered to be gross savings less the impact of free ridership. That is, because the energy savings realized by free riders are not induced by the program, these savings should not be included in the estimates of the program's actual (net) impacts. Without an adjustment for free ridership, some savings that would have occurred naturally would be incorrectly attributed to the program.

ADM performed a net savings analysis to estimate the impacts of the energy efficiency measures attributable to the Custom and Standard Incentives Program and the New Construction Programs that were net of free ridership. Information collected from a sample of program participants through a participant survey was used to estimate the extent of free ridership. Appendix A provides a copy of the survey instrument, and Appendix B presents tabulated responses for each survey question.

Based on a review of this information, the preponderance of evidence regarding free ridership inclinations was used to assess the likelihood of participant free ridership and in turn estimate net savings.

Several criteria were used for determining what portion, if any, of a participant's savings for a particular project should be attributed to free ridership. The first criterion was based on the response to the question: "Would you have been financially able to install the equipment or measures without the financial incentive from the program?" If a participant answered "No" to this question, a free ridership score of 0 was assigned to the project. That is, if a participant required financial assistance from the programs to undertake a project, then that participant was not deemed a free rider.

For decision makers that indicated that they were able to undertake energy efficiency projects without financial assistance from the program, three factors were analyzed to determine what percentage of savings may be attributed to free ridership. The three factors are:

- Plans and intentions of firm to install a measure even without support from the program
- Influence that the program had on the decision to install a measure
- A firm's previous experience with a measure installed under the program

For each of these factors, rules were applied to develop binary variables indicating whether or not a participant's behavior showed free ridership. These rules made use of answers to questions on the decision maker survey questionnaire. A copy of the questionnaire is provided in Appendix A.

The first factor required determining if a participant stated that his or her intention was to install an energy efficiency measure even without the program. The answers to a combination of several questions were used with a set of rules to determine whether a participant's behavior indicates likely free ridership. Two binary variables were constructed to account for participant plans and intentions: one, based on a more restrictive set of criteria that may describe a high likelihood of free ridership, and a second, based on a less restrictive set of criteria that may describe a relatively lower likelihood of free ridership.

The first, more restrictive criteria indicating participant plans and intentions that likely signify free ridership are as follows:

- The respondent answered "yes" to the following two questions: "Did you have plans to install the measure before participating in the program?" and "Would you have gone ahead with this planned installation of the measure even if you had not participated in the programs?"
- The respondent answered "definitely would have installed" to the following question: "If the financial incentive from the programs had not been available, how likely is it that you would have installed [Equipment/Measure] anyway?"
- The respondent answered "did not affect timing of purchase and installation" to the following question: "How did the availability of information and financial incentives through the programs affect the timing of your purchase and installation of [Equipment/Measure]?"
- The respondent answered "no, the program did not affect level of efficiency that we chose for equipment" in response to the following question: "How did the availability of information and financial incentives through the programs affect the level of energy efficiency you chose for [Equipment/Measure]?

The second, less restrictive criteria indicating participant plans and intentions that likely signify free ridership are as follows:

- The respondent answered "yes" to the following two questions: "Did you have plans to install the measure before participating in the program?" and "Would you have gone ahead

with this planned installation of the measure even if you had not participated in the programs?"

- Either the respondent answered "definitely would have installed" or "probably would have installed" to the following question: "If the financial incentive from the programs had not been available, how likely is it that you would have installed [Equipment/Measure] anyway?"

- Either the respondent answered "did not affect timing of purchase and installation" to the following question: "How did the availability of information and financial incentives through the programs affect the timing of your purchase and installation of [Equipment/Measure]?" or the respondent indicated that that while program information and financial incentives did affect the timing of equipment purchase and installation, in the absence of the program they would have purchased and installed the equipment within the next two years.

- The respondent answered "no, the program did not affect level of efficiency that we chose for equipment" in response to the following question: "How did the availability of information and financial incentives through the programs affect the level of energy efficiency you chose for [Equipment/Measure]?

The second factor required determining if a participant reported that a recommendation from a C&S Program or NC Program representative or past experience with the program was influential in the decision to install a particular piece of equipment or measure.

The criterion indicating that program influence may signify a lower likelihood of free ridership is that either of the following conditions are true:

- The respondent answered "very important" to the following question: "How important was previous experience with the programs in making your decision to install [Equipment/Measure]?

- The respondent answered "yes" to the following question: "Did a representative of the programs recommend that you install [Equipment/Measure]?"

The third factor required determining if a participant in the program indicated that he or she had previously installed an energy efficiency measure similar to one that they installed under the program without an energy efficiency program incentive during the last three years. A participant indicating that he or she had installed a similar measure is considered to have a likelihood of free ridership.

The criteria indicating that previous experience may signify a higher likelihood of free ridership are as follows:

- The respondent answered "yes" to the following question: "Before participating in the programs, had you installed any equipment or measure similar to [Rebated Equipment/Measure] at your facility?"

- The respondent answered "yes, purchased energy efficient equipment but did not apply for financial incentive." to the following question: "Has your organization purchased any energy efficient equipment in the last three years for which you did not apply for a financial incentive through the programs?"

The four sets of rules just described were used to construct four different indicator variables that address free ridership behavior. For each participant, a free ridership value was assigned based on the combination of variables. With the four indicator variables, there were 11 applicable combinations for assigning free ridership scores for each respondent, depending on the combination of answers to the questions creating the indicator variables. Table 3-1 shows these values.

*Table 3-1 Free Ridership Scores for Combinations of Indicator Variable Responses*

| *Indicator Variables* | | | | *Free Ridership Score* |
|---|---|---|---|---|
| *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 1)* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 2)* | *C&S Program had influence on Decision to Install Measure?* | *Had Previous Experience with Measure?* | |
| Y | N/A | Y | Y | 100% |
| Y | N/A | N | N | 100% |
| Y | N/A | N | Y | 100% |
| Y | N/A | Y | N | 67% |
| N | Y | N | Y | 67% |
| N | N | N | Y | 33% |
| N | Y | N | N | 33% |
| N | Y | Y | N | 0% |
| N | N | N | N | 0% |
| N | N | Y | N | 0% |
| N | N | Y | Y | 0% |

## 3.2 Results of Net Savings Estimation

The procedures described in the preceding section were used to estimate free ridership rates and net-to-gross ratios for the Custom and Standard Incentives Program and the New Construction Program for the period June 2011 through May 2012.

### 3.2.1 Realized Net kWh Savings

For the Custom and Standard Incentives Program, the data used to assign free ridership scores were collected through a survey of 193 participant decision makers for projects completed during the period June 2011 through May 2012. For the New Construction Program, the data used to

assign free ridership scores were collected through a survey of two participant decision makers for projects completed during the period June 2011 through May 2012

Individual free ridership rates were estimated for the standard incentive and Custom Incentives Program components and New Construction Program.

As discussed in Section 3.1, the first criteria in determining what proportion of energy savings from a project should be assigned to free ridership was whether a participant was financially able to undertake the project without financial assistance from the C&S Program. If a decision maker respondent answered "No" to the question of "Would you have been financially able to install the equipment or measures without the financial incentive from the C&S Program?" a free ridership score of 0 was assigned to the project. That is, if a participant required financial assistance from the C&S Program to undertake a project, then that participant was judged to not be a free rider.

Under this criterion, the other free ridership scoring criteria were applied only to projects for participants who answered "Yes" to the question: "Would you have been financially able to install the equipment or measures without the financial incentive from the C&S Program?" However, respondents who answered "No" to this question would be judged to have zero free ridership even if the other free ridership criteria were applied, due to the nature of their specific survey responses.

Table 3-2 shows the percentage of survey respondents who relayed the following: They had plans and intentions to install the measures without any program incentive (under two alternative definitions as described in the preceding section), that the program influenced their decision to install the measure, or that they previously installed a similar energy efficiency measure without an energy efficiency program incentive during the last three years. Percentages reported are averages weighted by project gross realized savings.

*Table 3-2 Weighted Average Indicator Variable Values*

| *Program Component* | *Had Financial Ability* | *Had Plans and Intentions to Install Measure without C&S Program (Definition 1)* | *Had Plans and Intentions to Install Measure without C&S Program (Definition 2)* | *C&S Program had influence on Decision to Install Measure* | *Had Previous Experience with Measure* |
|---|---|---|---|---|---|
| Custom kWh | 50% | 3% | 43% | 9% | 0% |
| Custom Therm | 31% | 11% | 30% | 32% | 0% |
| Standard kWh | 29% | 3% | 15% | 49% | 0% |
| Standard Therm | 88% | 16% | 26% | 80% | 0% |

Table 3-3 shows percentages of total realized gross Custom Incentives Program kWh savings that are associated with different combinations of free ridership indicator variable values. Forty-seven percent of the savings is associated with respondents who indicated that they were financially unable to implement the project in the absence of the program incentive.

*Table 3-3 Estimated Free ridership for kWh Savings from Custom Incentive Projects*

| *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 1)* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 2)* | *C&S Program had influence on Decision to Install Measure?* | *Had Previous Experience with Measure?* | *Percentage of Total Realized Gross kWh Savings* | *Free Ridership Score* |
|---|---|---|---|---|---|
| N | N | N | N | 35.4% | 0.0% |
| N | Y | N | N | 12.0% | 33.3% |
| Y | Y | N | N | 2.8% | 100.0% |
| N | Y | Y | N | 0.0% | 0.0% |
| Y | Y | Y | N | 0.0% | 66.7% |
| N | N | Y | N | 0.0% | 0.0% |
| Required program incentive to implement measures. | | | | 49.5% | 0.0% |
| Total | | | | 100.0% | 6.8% |

Table 3-4 shows percentages of total realized gross Standard Incentives Program kWh savings that are associated with different combinations of free ridership indicator variable values. Twenty-six percent of the savings is associated with respondents who indicated that they were financially unable to implement the project in the absence of the program incentive.

*Table 3-4 Estimated Free ridership for kWh Savings from Standard Incentive Projects*

| *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 1)* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 2)* | *C&S Program had influence on Decision to Install Measure?* | *Had Previous Experience with Measure?* | *Percentage of Total Realized Gross kWh Savings* | *Free Ridership Score* |
|---|---|---|---|---|---|
| N | N | Y | N | 12.5% | 0.0% |
| N | N | N | N | 8.2% | 0.0% |
| N | Y | Y | N | 3.7% | 0.0% |
| Y | Y | Y | N | 0.5% | 66.7% |
| N | Y | N | N | 1.8% | 33.3% |
| Y | Y | N | N | 2.2% | 100.0% |
| Required program incentive to implement measures. | | | | 71.1% | 0.0% |
| Total | | | | 100.0% | 3.1% |

Table 3-5 shows percentages of total realized gross Custom Incentives Program therm savings that are associated with different combinations of free ridership indicator variable values. Nineteen percent of the savings is associated with respondents who indicated that they were financially unable to implement the project in the absence of the program incentive.

*Table 3-5 Estimated Free ridership for Therm Savings from Custom Incentives Program Projects*

| *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 1)* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 2)* | *C&S Program had influence on Decision to Install Measure?* | *Had Previous Experience with Measure?* | *Percentage of Total Realized Gross Therm Savings* | *Free Ridership Score* |
|---|---|---|---|---|---|
| N | Y | N | N | 19.1% | 33.3% |
| Y | Y | Y | N | 10.6% | 66.7% |
| N | N | Y | N | 0.3% | 0.0% |
| Required program incentive to implement measures. | | | | 70.0% | 0.0% |
| Total | | | | 100.0% | 13.5% |

Table 3-6 shows percentages of total realized gross Standard Incentives Program therm savings that are associated with different combinations of free ridership indicator variable values. Fifty percent of the savings is associated with respondents who indicated that they were financially unable to implement the project in the absence of the program incentive.

*Table 3-6 Estimated Free ridership for Therm Savings from Standard Incentives Program Projects*

| *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 1)* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 2)* | *C&S Program had influence on Decision to Install Measure?* | *Had Previous Experience with Measure?* | *Percentage of Total Realized Gross Therm Savings* | *Free Ridership Score* |
|---|---|---|---|---|---|
| N | N | Y | N | 46.9% | 0.0% |
| N | N | N | N | 2.6% | 0.0% |
| Y | Y | Y | N | 14.3% | 66.7% |
| Y | Y | N | N | 1.3% | 100.0% |
| Required program incentive to implement measures. | | | | 24.3% | 0.0% |
| Total | | | | 89.5% | 10.9% |

The realized energy savings of the Custom and Standard Incentives Programs during the period June 2011 through May 2012 are summarized by utility in Table 3-7, Table 3-8, and Table 3-9. During this period, realized net kWh savings for the Custom Incentives Program totaled 54,076,457, while realized net kWh savings for the Standard Incentives Program totaled 64,041,574; for the New Construction Program, realized net kWh savings totaled 1,655,708. The net to gross ratio for the Custom Incentives Program component is 94%, while the net to gross ratio for the Standard Incentives Program component is 97%; for the New Construction Program, the net to gross ratio is 95%.

*Table 3-7 Summary of kWh Savings from Custom Incentive Projects*

| *Custom Program Component* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Realized Net kWh Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|
| Ameren | 16,469,402 | 16,098,932 | 15,205,435 | 94% |
| ComEd | 43,324,146 | 41,155,149 | 38,871,022 | 94% |
| Total | 59,793,548 | 57,254,082 | 54,076,457 | 94% |

*Table 3-8 Summary of kWh Savings from Standard Incentive Projects*

| *Standard Program Component* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Realized Net kWh Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|
| Ameren | 12,737,810 | 14,121,122 | 13,628,312 | 97% |
| ComEd | 43,414,120 | 52,236,242 | 50,413,262 | 97% |
| Total | 56,151,930 | 66,357,365 | 64,041,574 | 97% |

*Table 3-9 Summary of kWh Savings from New Construction Projects*

| *Standard Program Component* | *Expected kWh Savings* | *Realized Gross kWh Savings* | *Realized Net kWh Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|
| Ameren | 1,510,708 | 1,380,060 | 1,315,303 | 95% |
| ComEd | 390,977 | 357,165 | 340,405 | 95% |
| Total | 1,901,685 | 1,737,225 | 1,655,708 | 95% |

The realized therm savings of the Custom and Standard Incentives Programs during the period June 2011 through May 2012 are summarized by utility in Table 3-10, Table 3-11, and Table 3-12. During this period, realized net therm savings for the Custom Incentives Program totaled 2,193,620, while realized net therm savings for the Standard Incentives Program totaled 60,250; for the New Construction Program, realized net kWh savings totaled 11,907. The net to gross ratio for the Custom Incentives Program component is 87%, while the net to gross ratio for the Standard Incentives Program component is 85%; for the New Construction Program, the net to gross ratio is 86%.

*Table 3-10 Summary of Therm Savings from Custom Incentive Projects*

| *Custom Program Component* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Realized Net Therm Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|
| Ameren | 680,491 | 680,935 | 589,207 | 87% |
| Nicor | 442,426 | 241,615 | 209,068 | 87% |
| North Shore | 197,063 | 72,236 | 62,505 | 87% |
| Peoples | 997,764 | 1,540,336 | 1,332,839 | 87% |
| Total | 2,317,745 | 2,535,123 | 2,193,620 | 87% |

*Table 3-11 Summary of Therm Savings from Standard Incentive Projects*

| *Standard Program Component* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Realized Net Therm Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|
| Ameren | 23,327 | 11,206 | 9,570 | 85% |
| Nicor | 58,337 | 36,699 | 31,342 | 85% |
| North Shore | 6,377 | 5,427 | 4,635 | 85% |
| Peoples | 17,700 | 17,215 | 14,702 | 85% |
| Total | 105,741 | 70,548 | 60,250 | 85% |

*Table 3-12 Summary of Therm Savings from New Construction Projects*

| *Standard Program Component* | *Expected Therm Savings* | *Realized Gross Therm Savings* | *Realized Net Therm Savings* | *Net to Gross Ratio* |
|---|---|---|---|---|
| Ameren | 3,929 | 4,283 | 3,681 | 86% |
| Nicor | 8,781 | 9,571 | 8,227 | 86% |
| Total | 12,710 | 13,854 | 11,907 | 86% |

### 3.2.2 Realized Net Peak kW Savings

The realized net peak kW reductions of the custom and standard components of the C&S Program and NC Program during the period June 2011 through May 2012 are summarized by program component in Table 3-13, Table 3-14, and Table 3-15. The achieved net peak demand savings for the Custom Incentives Program are 5,895kW, while the achieved net peak demand savings for the Standard Incentives Program component are 9,384 kW. For the New Construction Program, the achieved net peak demand savings are 181 kW.

*Table 3-13 Summary of Peak kW Savings from Custom Incentive Projects*

| *Custom Program Component* | *Realized Net Peak kW Savings* |
|---|---|
| Ameren | 1,640 |
| ComEd | 4,191 |
| Total | 5,831 |

*Table 3-14 Summary of Peak kW Savings from Standard Incentive Projects*

| *Standard Program Component* | *Realized Net Peak kW Savings* |
|---|---|
| Ameren | 1,970 |
| ComEd | 7,286 |
| Total | 9,255 |

*Table 3-15 Summary of Peak kW Savings from New Construction Project*

| *Program Component* | *Realized Net kW Savings* |
|---|---|
| Ameren | 142 |
| ComEd | 37 |
| Total | 179 |

### 3.2.3 Potential Spillover or Free Drivership Effects

Answers to the following two question two questions on the survey of decision makers were used in analyzing whether there were potential "free driver" effects associated with non-rebated purchases by C&S Program participants:

- Before you knew about DCEO's energy efficiency incentive programs, had you purchased and installed any energy efficient equipment at this facility?
- Has your experience with the C&S Program led you to buy any energy efficient equipment for which you did not apply for a rebate?
- If a participant answered "no" to the first question, and "yes" to the second question, the participant was considered to show a degree of potential free drivership.

Table 3-16 shows the percentage of custom incentive realized gross energy savings that is associated with different combinations of free drivership indicator variable values for the Custom Incentives Program. Table 3-17 shows the percentage of standard incentive realized gross energy savings that is associated with different combinations of free drivership indicator variable values for the Standard Incentives Program.

Respondents who represented about 24.0% of total custom incentive realized gross energy savings and 13.3% of total standard incentive realized gross energy savings gave answers that were indicative of spillover effects (i.e., the no-yes combination).

*Table 3-16 Summary of Potential Free Drivership from Custom Incentives Projects*

| *Purchased and installed energy efficient equipment prior to knowledge of program* | *Program experience led to purchase of unrebated energy efficient equipment* | *Percentage of Total Realized Gross kWh Savings* |
|---|---|---|
| N | N | 60.6% |
| N | Y | 24.0% |
| Y | N | 12.4% |
| Y | Y | 3.0% |
| Total | | 100.0% |

*Table 3-17 Summary of Potential Free Drivership from Standard Incentives Projects*

| *Purchased and installed energy efficient equipment prior to knowledge of program* | *Program experience led to purchase of unrebated energy efficient equipment* | *Percentage of Total Realized Gross kWh Savings* |
|---|---|---|
| N | N | 38.7% |
| N | Y | 13.3% |
| Y | N | 17.7% |
| Y | Y | 30.3% |
| Total | | 100.0% |

Table 3-18 shows the percentage of realized gross therm savings that is associated with different combinations of free drivership indicator variable values for the Custom Incentives Program. Table 3-19 shows the percentage of realized gross therm savings that is associated with different combinations of free drivership indicator variable values for the Standard Incentives Program.

Respondents who represented about 0.0% of total custom incentive realized gross energy savings and 58.2% of total standard incentive realized gross energy savings gave answers that were indicative of spillover effects (i.e., the no-yes combination).

*Table 3-18 Summary of Potential Free Drivership from Custom Incentives Projects*

| *Purchased and installed energy efficient equipment prior to knowledge of program* | *Program experience led to purchase of unrebated energy efficient equipment* | *Percentage of Total Realized Gross Therm Savings* |
|---|---|---|
| N | N | 26.2% |
| N | Y | 0.0% |
| Y | N | 73.6% |
| Y | Y | 0.3% |
| Total | | 100.0% |

*Table 3-19 Summary of Potential Free Drivership from Standard Incentives Project*

| *Purchased and installed energy efficient equipment prior to knowledge of program* | *Program experience led to purchase of unrebated energy efficient equipment* | *Percentage of Total Realized Gross Therm Savings* |
|---|---|---|
| N | N | 22.9% |
| N | Y | 58.2% |
| Y | N | 14.6% |
| Y | Y | 4.4% |
| Total | | 100.0% |

### 3.2.4 Sensitivity Analysis

The methodology used to assess net savings (i.e., the portion of gross savings that can be attributed to the effects of the program) assigns a probability of free ridership to projects based on decision maker survey responses. To assign a probability of free ridership, a set of rules is applied to decision maker survey responses based on how the decision maker responds to the questions.

A key component of assessing free ridership with these rules is determining the financial ability of the participant to afford the project without the financial support provided by the program. This focus on financial considerations is consistent with the significant finding from a survey of U.S. cities conducted in 2011 for The United States Conference of Mayors that "Far more than any other limitations, cities identify financial constraints as the most significant challenge to implementing energy efficiency improvements and to developing clean energy supplies." [6]

For the free-ridership analysis, decision makers who indicated that they were not financially able to install the equipment without the assistance provided by the program were considered to have zero probability of free ridership. The assumption being that if a decision maker indicates their organization could not have afforded the project implemented through the program without the financial assistance provided by the program, then the project would not have occurred in the absence of the program.

Concerns have been raised about using financial ability as a screen that can result in the assessment of a decision maker as having a zero probability of free ridership. This concern is largely due to the fact that a participant's financial ability is determined by a single question, as opposed to a multi-factor assessment, which could potentially attribute a large amount of savings to the effects of the program when they should be attributed to free ridership.

To assess this concern, a sensitivity analysis was performed to investigate the robustness of the net savings results to an alternative specification of free ridership that omitted the financial ability screen. Removing the financial ability screen changed the assessed probability of free ridership for four of the 164 survey respondents. Of the four respondents, each realized electric savings through the programs, and none completed projects that resulted in natural gas savings.

As shown in Table 3-20, each of the four respondents met the less restrictive criteria for having had prior plans and intentions to complete the projects, but did not meet the criteria indicating that the program had an influence on their decision to install the measure or that they had previous experience with the measure. Consequently, if the financial screen is not applied, the assessed level of free ridership increases by 33% for each of these respondents.

[6] The United States Conference of Mayors, *Clean Energy Solutions for America's Cities*, June 2011, p. 7.

*Table 3-20 Estimated Free Ridership with and without the Financial Ability Screen*

| *Participant* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 1)* | *Had Plans and Intentions to Install Measure without the C&S Program? (Definition 2)* | *C&S Program had influence on Decision to Install Measure?* | *Had Previous Experience with Measure?* | *Free Ridership (w/ financial ability screen)* | *Free Ridership (w/o financial ability screen)* |
|---|---|---|---|---|---|---|
| 1 | N | Y | N | N | 0% | 33% |
| 2 | N | Y | N | N | 0% | 33% |
| 3 | N | Y | N | N | 0% | 33% |
| 4 | N | Y | N | N | 0% | 33% |

Table 3-21 displays the impact on net electric savings for the Custom, Standard, and New Construction Programs. Across all programs, net savings are decreased by 5.6 percentage points if the financial screen is not applied.

*Table 3-21 Net kWh Savings with and without the Financial Ability Screen*

| *Program* | *Gross* | *Net kWh Savings (w/ financial screen)* | *NTGR (w/ financial screen)* | *Net kWh Savings (without financial filter)* | *NTGR (w/o financial screen)* | *ΔNet kWh Savings* | *ΔNTGR* |
|---|---|---|---|---|---|---|---|
| Custom | 57,254,082 | 54,076,457 | 94% | 48,627,557 | 85% | (5,448,900) | -9.5% |
| Standard | 66,357,365 | 64,041,574 | 97% | 62,624,846 | 94% | (1,416,728) | -2.1% |
| New Construction | 1,737,225 | 1,655,708 | 95% | 1,543,766 | 89% | (111,943) | -6.4% |
| Total | 125,348,671 | 119,773,739 | 96% | 112,796,168 | 90% | (6,977,571) | -5.6% |

Overall, the impact of the financial ability screen on the assessed net savings is not negligible but is relatively small. This means that whether the financial ability screen is used or not to assess free ridership, the net savings are not significantly affected.

However, not using the financial ability screen results in the loss of an important indicator of free ridership. Whether or not an organization has the budget resources to invest in energy efficiency is a key determinant of whether or not the organization would make these improvements on their own. Moreover, the assessment of whether or not the organization could afford a project is likely relatively straight forward and one that is easier for decision makers to make than, for example, an assessment of the importance of the program in consideration of all other factors that may have influenced the decision.

Regarding the four aforementioned cases, not using the financial ability screen would likely misclassify a portion of these savings as attributable to free ridership. While the four decision makers indicated that they did not have the financial ability to implement these projects, they did indicate that they had prior plans. However, two of these respondents indicated that their plans were more general and did not identify the specific equipment implemented. Furthermore, none of the four participants had previous experience with similar measures. These responses suggest that while these participants had plans, they may have been relatively naïve in terms of what equipment would be installed and what savings would have been realized from that equipment. Additionally, all of the participants indicated that they evaluate energy efficiency improvements using financial metrics, namely the initial cost, the simple payback, the life-cycle cost, and the internal rate of return. The use of these financial metrics emphasizes the importance of financial considerations for these participants, which in turn, emphasizes the importance of the financial screen for assessing free ridership.

### 3.2.5 Comparison of EPY4/GPY1 Net Savings with EPY3 Net Savings

The assessed net savings for the Custom and Standard Program activity during EPY4/GPY1 differed markedly from the net savings found for the EPY3 program activity as shown in Table 3-22. The difference between estimated net savings is likely mainly a reflection of different methodological approaches for assessing free ridership, rather than a substantial change in actual program free ridership between EPY3 and EPY4/GPY1. The methodological changes were associated with a change in evaluation contractors between EPY3 and EPY4/GPY1.

*Table 3-22 Comparison of Net-to-gross Ratios for EPY3 and EPY4/GPY1*

| | *EPY3 Net-to-gross Ratio* | *EPY4/GPY1 Net-to-gross Ratio* | |
|---|---|---|---|
| *Program* | *kWh Savings* | *Therm Savings* | *kWh Savings* |
| Custom | .74 | .86 | .95 |
| Standard | .66 | .87 | .98 |

As the new evaluation contractor, ADM Associates employed a methodological approach for assessing EPY4/GPY1 free ridership that was different from the approach used by the previous evaluation contractor – Navigant Consulting – to assess EPY3 free ridership. Both approaches employed self-report methodologies and both approaches endeavored to assess the portion of gross energy savings that are not attributable to the programs. However, the means by which the two methods assessed free ridership differ in several ways.

To investigate these differences, ADM performed a comparative analysis of the two free ridership assessment approaches. To enable direct comparison of each approach, ADM administered a survey instrument that combined the batteries of questions associated with each assessment methodology to a subset of 20 PY5 program participants. The results of this analysis indicated that it is highly likely that the differences in assessed free ridership between EPY3 and EPY4/GPY1 are primarily attributable to differences in the assessment methodology rather than changes in actual free ridership from one year to the next.

#### 3.2.5.1. Comparison of EPY3 and EPY4/GPY1 Methodologies for Assessing Free Ridership

The EPY3 and EPY4/GPY1 methods differ both in the conceptual approaches used to assess free ridership and in the methodologies regarding how these conceptual approaches are put into practice.

*Conceptual Differences in Factors Related to Free Ridership*

The EPY3 and the EPY4/GPY1 assessment methods both define free ridership as the portion of energy savings that would have occurred in the absence of the program; however, the methods differ in the conceptual approaches used to assess free ridership, as shown in Table 3-23.

*Table 3-23 Summary of EPY3 and EPY4/GPY1 Methodologies for Assessing Free Ridership*

| | *EPY3* | | *EPY4/GPY1* | |
|---|---|---|---|---|
| *Free Ridership Assessment Factor* | *Description of Assessment Factor* | *Answer Method* | *Description of Assessment Factor* | *Answer Method* |
| Financial Ability | - | - | Based on the response to the question: "Would you have been financially able to install the equipment or measures without the financial incentive from the program?" If a participant answered "No" to this question, a free ridership score of 0 was assigned to the project. That is, if a participant required financial assistance from the programs to undertake a project, then that participant was not deemed a free rider. | Verbal descriptions with discrete options |
| Program Influence | Based on the respondents' rating of the influence of the program on the decision to implement the project. This factor is scored based on respondent assignment of points on a 0-100 scale regarding the level of influence the program had on the decision. The factor score is equal to the respondent point assignment value divided by 10. Adjustments are made based on project timing | Numeric: 0-100 scale | Based on if a participant reported that a recommendation from a C&S Program or NC Program representative or past experience with the program was influential in the decision to install a particular piece of equipment or measure. | Verbal descriptions with discrete options |
| Program Components | Based on the respondent rating of the influence each program component (e.g., availability of incentives, technical assistance, etc.) had on the participant's decision to implement the project. The highest score given to a single program component determines the score for this factor. | Numeric: 0-10 scale | | |
| No-Program | Based on respondents' assessments of the likelihood that they would have installed exactly the same equipment in the absence of the program. This factor is scored such that 0 to 10 points are assigned to the likelihood of the project being completed without the program. Adjustments are made based on when the participant would have completed the project had they not participated in the program. | Numeric: 0-10; Verbal descriptions with discrete options | Based on if a participant stated that his or her intention was to install an energy efficiency measure even without the program. The answers to a combination of several questions were used with a set of rules to determine whether a participant's behavior indicates likely free ridership. Two binary variables were constructed to account for participant plans and intentions: one, based on a more restrictive set of criteria that may describe a high likelihood of free ridership, and a second, based on a less restrictive set of criteria that may describe a relatively lower likelihood of free ridership. | Verbal descriptions with discrete options |
| Had Prior Plans & Intentions | - | - | | |
| Previous Experience | - | - | Based on if a participant in the program indicated that he or she had previously installed an energy efficiency measure similar to one that they installed under the program without an energy efficiency program incentive during the last three years. A participant indicating that he or she had installed a similar measure is considered to have a likelihood of free ridership. | Verbal descriptions with discrete options |

According to the EPY3 assessment method, determining the probability the project would have been completed in the absence of the program, is based on an assessment of three factors:

- *Program Influence*. The program influence score is based on the respondents' rating of the influence of the program on the decision to implement the project. This factor is scored based on respondent assignment of points on a 0-100 scale regarding the level of influence the program had on the decision. The factor score is equal to the respondent point assignment value divided by 10. Adjustments are made based on project timing.

- *Program Components.* The program components score is based on the respondent rating of the influence each program component (e.g., availability of incentives, technical assistance, etc.) had on the participant's decision to implement the project. The highest score given to a single program component determines the score for this factor.

- *No-program.* The no-program score is based on respondents' assessments of the likelihood that they would have installed exactly the same equipment in the absence of the program. This factor is scored such that 0 to 10 points are assigned to the likelihood of the project being completed without the program. Adjustments are made based on when the participant would have completed the project had they not participated in the program.

The assessment of the three factors therefore results in the creation of a set of three scores developed using 0-10 scales, where a lower score indicates a higher level of assessed free ridership.

According to the EPY3 assessment method, the free ridership score of each project is determined by assigning a maximum score of 1, where a score of 1 indicates an assessment of zero free ridership. The three factor scores are summed to derive a composite score. The composite score is divided by 30 in order to scale it to a range of 0 to 1 so that the score represents the ratio of assessed net to gross savings. This approach gives equal weight to each of the three factors in determining level of free ridership.

Because the EPY3 methodology assesses both the probability of project completion due to the effects of the program (i.e., the program components and program influence factors), as well as the probability of project completion not due to program influence (i.e., the no-program factor), a high degree of consistency between these calculated factor scores would be intuitive. The no-program score is calculated so that a higher value is assigned to a project that has a reported lower likelihood of being completed in the absence of the program. The other two factor scores represent measures of the effects of the program. Respondent consistency would imply that all three scores are highly correlated (i.e. the same or similar values for each). However, as shown in Table 3-24, presented below in the section presenting the results of the comparison study, there are several scores for which there is marked inconsistency across the three factors.

In some cases, the values of the program component and the program influence scores differ by more than eight of the ten possible points. This difference in scores indicates that that respondents are providing answers that indicate that, per the EPY3 assessment framework, parts of the program were very important to the decision to complete the project, while simultaneously indicating that the program not influential overall. Additionally, the program influence score and the no-program score differed by as much as nine points. Thus, these responses counter-intuitively imply that the neither program factors, nor non-program factors, influenced the project. Some of these inconsistencies may have arisen as a result of the survey methodology employed as discussed below in 3.2.5.2

The EPY4/GPY1 methodology assesses free ridership by assigning a probability that the project would have been completed in the absence of the program based on a variety of decision making factors. These factors are:

- *Financial Ability*. Respondents' ability to afford the project without the financial assistance provided;
- *Program Influence*. Influence of the program on the decision to implement the project.
- *Had Prior Plans & Intentions*. Respondents' prior plans and intentions to implement the project; and
- *Previous Experience*. Respondents past experience with measures similar to those implemented through the program.

The assessed probability of project completion in the absence of the program is determined by a set of rules applied to survey responses.

A key component of the EPY4/GPY1 methodology is the use of a project affordability screen that can reduce assessed free ridership to zero. Specifically, respondents were asked whether or not they would have been financially able to complete the project without the financial incentive provided by the program. Participants who state that they were not able to afford the project without the incentive are determined to have zero probability of being a free rider.[7] This focus on financial considerations is consistent with the significant finding from a survey of U.S. cities conducted in 2011 for The United States Conference of Mayors that "Far more than any other limitations, cities identify financial constraints as the most significant challenge to implementing energy efficiency improvements and to developing clean energy supplies."[8] While the EPY3 methodology does explicitly consider the influence of the incentive on the decision, it does not explicitly consider whether or not the decision maker's organization could have independently afforded to complete the project.

[7] As described in Section 3.2.4, a sensitivity analysis was performed and it was determined that the use of the screen had a relatively small effect on assessed net savings.

[8] The United States Conference of Mayors, *Clean Energy Solutions for America's Cities*, June 2011, p. 7.

Another key distinction of the EPY4/GPY1 methodology is that it gives consideration to the decision maker's prior plans and intentions as a factor indicating probability of free ridership. This factor assesses whether or not the respondent had prior plans to complete a similar project during a similar time period. A participant's project is scored as having a free ridership probability of 1 if his or her responses meet a restrictive set of criteria for having such prior plans and intentions. If the participant's responses meet a less restrictive set of criteria regarding such prior plans and intentions, the project's probability of free ridership is scored as .33.

In contrast, the EPY3 methodology does not explicitly ask decision makers about prior plans. Instead, respondents rate the influence of other factors that may have affected their plans, e.g., the age of the current equipment and whether or not they would have completed the project with without the program. The EPY3 methodology incorporates the timing of when the respondent learned of the program as, while the EPY4/GPY1 methodology determines when the decision was made to implement the project.

Both the EPY3 and EPY4/GPY1 methodologies give explicit consideration to the influence the program had on the decision to complete the projects. However, the two methods treat this factor differently in deriving an estimate of free ridership. According to the EPY3 methodology, a participant's rating of the influence of the program can increase the level of assessed free ridership if the participant gives more weight to factors other than the program. On the other hand, the EPY4/GPY1 methodology reduces the assessed probability that the decision maker is a free rider if his or her responses suggest that the program influenced the project despite having prior plans to complete it. In other words, a premise of the EPY3 methodology is that if non-program factors were influential to the decision making related to the project, these factors effectively reduce the influence the program had on the project. The approach used in the EPY4/GPY1 methodology allows for the importance of other factors, without necessarily diminishing the program's incremental importance in the decision making process.

Lastly, the EPY4/GPY1 methodology includes an assessment of participants' experience with similar measures as a factor in determining the probability that the participant is a free rider. That is, the methodology is premised on the assumption that decision makers who indicated that they had previously implemented a similar measure in the recent past are more likely to be a free rider than those who have not. Accordingly, the level of free ridership is increased for participants who indicate that they have prior experience with a similar measure. The EPY3 methodology incorporates previous experience as one alternative factor in the assessment of the influence of program components, rather than treating it as a separate indicator variable with specific free ridership logic.

*Differences in the Application of Free Ridership Assessment*

Aside from conceptual differences, there are also a number of differences in how the two approaches are put into practice. These differences are highly likely to affect the level of assessed free ridership.

For example, the EPY3 methodology employs rating scales that use numeric response options (i.e., asking a respondent to provide a rating on a 0-100 scale or a 0-10 scale). However, this is problematic because the choice of numeric scales is not an inconsequential decision.[9] The choice of numeric scales can influence a response to a question that is independent of the question itself.[10] That is, depending on what numbers are used in the scale, the average response may be lower or higher than it would be if a different set of numbers were used for the scales.

In short, a potential problem is that the use of numeric responses may unintentionally bias responses in ways that may be avoided if verbal descriptors are used instead. Furthermore, research has found that the use of verbal descriptors tends to result in more consistent responses than numeric scales anchored by verbal descriptors as endpoints of the scale.[11] The previously noted inconsistency found across the EPY3 free ridership factors may, in part, be explained by the use of numeric scales. It is for these reasons that the EPY4/GPY1 methodology employs rating scales that utilize verbal descriptions as opposed to rating scales that use numeric responses.

Of particular concern is the scale used in the EPY3 methodology that uses a 0-100 scale used to score the program influence factor. Specifically, the EPY3 methodology asks participants to respond to this question:

> *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?*

Research on the use of 0-100 scales has found that respondents do not use all of the possible scale values.[12] Rather, the majority of respondents use only a few of the possible numeric responses (e.g. 15, 85, and multiples of 10). The use of a limited number of values may be due to certain numbers standing out as being more prototypical to respondents and these numbers serving as cognitive reference points for respondents attempting to answer a question. For example, respondents could simplify the 0-100 scale by limiting their responses to the following options: 10, 15, 20, 40, 50, 85, and 100. In this case the responses will be biased downward because respondents simplify the scale such that there are more response options at the lower end of the scale. Thus, when respondents round their response to fit into one of the de facto response options, the net effect is biasing responses downward. Moreover, this hypothetical case may be the norm because research suggests that respondents tend to have mental

[9] Tourangeau, R., & Rips, L. J. K. Rasinski (2000). *The psychology of survey response*.

[10] Schwarz, N. (1999). Self-reports: how the questions shape the answers. *American Psychologist*, 54, 93-105.

[11] Krosnick, J. A., & Berent, M. K. (1993). Comparisons of party identification and policy preferences: The impact of survey question format. *American Journal of Political Science*, 3, 941-964.

[12] Tourangeau, R., & Rips, L. J. K. Rasinski (2000). *The psychology of survey response*.

representations of 0-100 point scales that include more points at the lower end of the scale than at the higher end of the scale.[13]

Another concern regarding the program influence question used in the EPY3 methodology is that it takes the respondents' rating of the relative importance of the program as an indication of the absolute importance of the program in the administration of some of the follow-up consistency (check) questions. For example, a participant who assigns 20 out of 100 points to the influence of the program but who earlier rated various elements of the program as very important is prompted with this question:

> *You just gave <RESPONSE> points to the importance of the program. I would interpret that to mean that the program was not very important to your decision to install this equipment. Earlier, when I asked about the importance of individual elements of the program I recorded some answers that would imply that they were very important to you. Just to make sure I understand, would you explain why the program was not very important in your decision to install this equipment?*

The follow-up question assumes that because such a participant assigned a low level of importance to the program compared to other factors, the overall influence of the program was unimportant. Thus, the respondent is prompted with a question that makes this assumption and asks the respondent to explain why they just said the program was unimportant. In fact, while the program may have had lower importance in comparison to other factors such as the payback on the investment or the recommendation from a vendor, it may still have been the decisive factor such that the respondent does not consider the two responses to be contradictory. Rather than allow for this possibility, through the implicit assertion that the absolute importance of the program was low, the follow-up question seemingly compels the respondent to change his or her previous assessment that aspects of the program were influential to the project decision making.

A final concern with the EPY3 approach is that it fails to appropriately hone in on the energy efficiency component of the project, thereby producing upwardly-biased estimates of free ridership. For instance, it is uncertain why decision maker attribution of importance to "age or condition of old equipment" should increase the estimate of free ridership as is done with the program influence factor. For instance, for a normal replacement project, it is intuitive that the condition of the pre-existing equipment would be critical to the decision to replace the equipment, but not necessarily to the decision to implement energy efficient equipment.

[13] Ibid.

#### 3.2.5.2. Results of Study Comparing EPY3 and EPY4/GPY1 Methodologies for Assessing Free Ridership

As noted previously, ADM administered questions associated with both methodological approaches, aside from the consistency checks used in the EPY3 method, to a subset of 20 decision makers who received custom or standard incentives during EPY5/GPY2. Although this limited sample is not considered to be representative of all of the program participants, it may be illustrative as a case study of how the EPY3 methodology, by virtue of the methodology itself, may produce upwardly-biased estimates of free ridership.

For the 20 decision makers who responded to the survey, the average net-to-gross ratio using the EPY3 methodology was 69% compared to 93% using the EPY4/GPY1 methodology, as shown in Table 3-24. For 18 of the twenty cases, the EPY4/GPY1 methodology produced lower estimates of free ridership than the EPY3 methodology. Assessed free ridership was identical in one case, and in another case, the EPY4/GPY1 methodology resulted in a higher estimate of free ridership than the EPY3 methodology.

*Table 3-24 Free Ridership as Assessed using EPY3 and EPY4/GPY1 Methodologies*

| | PY 3 Methodology | | | | PY4 Methodology | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Respondent* | *Program Components score.* | *Program Influence score.* | *No-Program score.* | *Net-to-Gross* | *Had Financial Ability* | *Had Plans I* | *Had Plans II* | *Program Influence* | *Had Previous Experience* | *Net-to-Gross* |
| 1 | 10 | 8.0 | 2 | 67% | Y | N | N | Y | N | 100% |
| 2 | 10 | 7.5 | 10 | 92% | N | N | N | N | N | 100% |
| 3 | 10 | 1.0 | 10 | 70% | Y | N | N | N | N | 100% |
| 4 | 9 | 2.5 | 2 | 45% | Y | N | Y | N | N | 67% |
| 5 | 10 | 5.0 | 10 | 83% | Y | N | N | Y | N | 100% |
| 6 | 8 | 2.0 | 4 | 47% | Y | N | N | Y | Y | 100% |
| 7 | 6 | 1.5 | 4 | 38% | Y | N | N | N | N | 100% |
| 8 | 9 | 2.5 | 4 | 52% | Y | N | Y | N | Y | 33% |
| 9 | 10 | 7.5 | 10 | 92% | N | N | N | Y | N | 100% |
| 10 | 10 | 2.5 | 4 | 55% | Y | N | Y | N | N | 67% |
| 11 | 10 | 6.0 | 4 | 67% | N | N | N | N | N | 100% |
| 12 | 10 | 5.0 | 10 | 83% | Y | N | N | Y | N | 100% |
| 13 | 10 | 1.3 | 10 | 71% | Y | N | N | N | N | 100% |
| 14 | 10 | 7.5 | 4 | 72% | N | N | N | N | N | 100% |
| 15 | 10 | 3.0 | 6 | 63% | N | N | N | N | N | 100% |
| 16 | 8 | 4.0 | 10 | 73% | N | N | N | N | N | 100% |
| 17 | 9 | 9.0 | 8 | 87% | N | N | N | Y | N | 100% |
| 18 | 10 | 9.9 | 10 | 100% | N | N | N | N | N | 100% |
| 19 | 7 | 4.0 | 2 | 43% | Y | N | Y | Y | N | 100% |
| 20 | 10 | 9.0 | 8 | 90% | N | N | N | Y | N | 100% |
| Average | | | | 69% | | | | | | 93% |

The 31% free ridership rate as assessed using the EPY3 methodology is distributed across the three factors as follows:

- Program Influence Score – 17%;
- No-Program Score – 11%; and
- Program Components Score – 2%.

ADM reviewed the responses associated with particularly low estimates of net savings to determine if the low estimates were consistent with the overall survey response narrative. The summary of the review of these cases is presented below.

- A responding decision maker for a lighting project received a net-to-gross ratio of 38% using the EPY3 methodology, largely due to a low program influence score and a low no-program score. Although the decision maker stated that they had prior plans for the project and that they would have completed the project without the program, the respondent stated that they installed more equipment as a result of the program and that the efficiency of installed equipment was higher than what would have been installed without the program.

- A responding decision maker for a lighting project received a net-to-gross ratio of 43% with the EPY3 methodology, largely due to the low program influence score and a low no-program score. Although this participant had prior plans to complete the project, the decision maker stated that the previous experience with the DCEO programs was very important to their decision to install the equipment and that the organization installed more equipment than they would have without the program. Moreover, some factors related to the program were given high ratings of importance; specifically, the project payback, which is affected by the program incentive, as well as information from program or DCEO marketing materials.

- A responding decision maker for a lighting project was scored as having a net-to-gross ratio of 47% with the EPY3 methodology, largely due to the low program influence score and a low no-program score. This decision maker gave high ratings of importance to the incentive, the technical assistance from DCEO or SEDAC, the recommendation of a program staff person, and the program materials. The respondent stated that the organization installed more equipment and more efficient equipment because of the program. Although the decision maker only assigned 40 points to the program influence, in a comment made in response to an open-ended question, he or she stated that "Even though our [organization type] is financially secure, the grant process and the availability of the grant money allowed me to show a higher return on investment, which helped sell the project and the process to my board of education. It was critical to the success of the project and move[d] our energy efficiency projects ahead."

- A responding decision maker for a motor project was scored as having a net-to-gross ratio of 63% with the EPY3 methodology, largely due to the low program influence

score. The respondent gave 30 points to the influence of the program, and stated that the organization would have installed the equipment in two to three years without the program. The respondent also indicated that they would not have been financially able to install the equipment without the incentive, and that they installed more equipment with higher efficiency level than they otherwise would have without the program. He or she also gave a high rating of importance of the incentive to the decision.

- A responding decision maker for a project involving the installation of three furnaces received a net-to-gross score of 67% using the EPY3 methodology, largely due to the no-program score. Although the respondent stated that they would have installed the furnaces without the program, the respondent stated that the program affected the efficiency of the equipment selected. The respondent also indicated that a recommendation from a DCEO staff member and program materials were very important to the decision.

- A responding decision maker for a lighting project received a net-to-gross score of 67% using the EPY3 methodology, largely due to the program influence score and the no program score. Although the respondent gave 60 points to the importance of the program to the decision, he or she also stated that they could not have afforded the project without the incentive and that they probably would not have installed the equipment without it. The decision maker also stated that without the program, they would have completed the project in one to two years. The respondent stated that because of the program, they installed a higher quantity of equipment and at a higher efficiency level.

These responses illustrate that in these cases, the EPY3 methodology results in an overly conservative estimate of net savings that in many ways contradicts the overall respondent narrative of the development of the projects implemented through the DCEO programs.

# 4. Process Evaluation

This chapter presents the results of the process evaluation of the Public Sector Custom and Standard Incentives Programs (Custom and Standard Incentives Programs) and the Public Sector New Construction Program (New Construction Program) during electric program year four and natural gas program year one (EPY4/GPY1). EPY4/GPY1 is the period from June 2011 to May 2012. The process evaluation focuses on the effectiveness of program policies and organization, as well as the program delivery framework. The purpose of the process evaluation is to assess the design and recent results of the programs in order to determine how effectively they are achieving their intended outcomes. This evaluation is based upon analysis of program structure, interviews with program staff, surveys of program participants, and program tracking data.

The chapter begins with a discussion of conclusions from the evaluation and an examination of certain issues that are important to the future success of the program. This chapter also presents strategic planning and process recommendations, and highlights key findings from the surveys and interviews of participants and program staff. The information in this chapter provides insight into participant decision making behaviors, and identifies any key issues that may be addressed in future program years.

## 4.1 Evaluation Objectives

The purpose of the process evaluation is to examine program operations and results throughout the program operating year, and to identify potential program improvements that may prospectively increase program efficiency or effectiveness in terms of participation and satisfaction levels. This process evaluation was designed to document the operations and delivery of the Standard Incentives Program, Custom Incentives Program, and the New Construction Program during PY4/GPY1.

Key research questions to be addressed by this evaluation of EPY4/GPY1 activity include:

> *Are the programs effectively reaching potential participants and meeting their efficiency needs?*
>
> *Was the delivery of the programs effective and successful?*
>
> *Did the programs reduce barriers to increased energy efficiency project implementation?*

During the evaluation, data and information from numerous sources are analyzed to achieve the stated research objectives. Insight into the participant experience with the programs is developed from an online and telephone survey of program participants. The program operations perspective is developed through in-depth interviews with program staff members.

## 4.2 Summary of Primary Data Collection

Participant surveys are the primary data source for many components of this process evaluation and serve as the foundation for understanding the participant perspective. The participant surveys provide feedback and insight regarding participant experiences with the Standard Incentives Program, Custom Incentives Program, and the New Construction Program. Respondents report on their satisfaction with the program, detail their motivations and the factors affecting their decision making process, and provide recommendations related to improving the program.

## 4.3 Summary of Conclusions and Recommendations

The interviews and surveys that were conducted with EPY4/GPY1 participants in the Custom and Standard Incentives Programs, and participants in the New Construction Program suggest that the programs were effective in their delivery and operations.

The following presents a selection of key conclusions from EPY4/GPY1:

- **High Program Satisfaction:** EPY4/GPY1 participants noted high levels of satisfaction with the programs. Few problems were noted regarding the implementation of the efficiency measures, the application process, the incentive amount, or the receipt of the incentive. In many of the open-ended responses, several participants stated that they were satisfied with the program and grateful for the assistance.

  Participant satisfaction is an important asset for the programs. Public sector organizations tend to collaborate and share information and other resources. Satisfied participants are more likely to encourage their colleagues to participate in the program. This word of mouth effect will be an important driver of future program activity.

- **Lack of Available Funding is an Important Barrier:** The barrier to making energy efficiency improvements most frequently mentioned by participants was a lack of financial resources. This suggests that the public sector organizations who participated during the program year were encouraged to implement efficiency improvements because the incentives offset the initial cost. The reduced cost could facilitate the completion of projects because public sector entities by allowing projects to meet budget requirements, the allowing projects to comply with least cost purchasing rules, or by lowering project costs below thresholds that require projects to be funded with a capital request. Regarding the last point, capital requests for efficiency improvements often have to compete for funding with other higher priority projects and thereby may not receive funding because other priorities take precedence. Moreover, participants reported that the approval time for capital requests was longer than the average approval time for equipment purchases in general. The hazards of the capital approval process may negatively impact public sector entities ability to implement efficiency improvements and incentive payments may allow projects to avoid this process.

The informational resources provided through the programs may also have increased the implementation of energy efficient technologies by the public sector entities. One-fifth of survey respondents stated that lack of information on efficient technologies and practices was a barrier to implementing energy efficiency improvements. The DCEO and its partners provide prospective participants with a number of informational resources that can help fill this knowledge gap in public sector entities and encourage the adoption of efficient equipment.

- **Program Staff are Improving Program Administration:** Interviewed program staff discussed program operation and management challenges that have been identified as well as solutions to address these problems. Examples of challenges the program has faced were delays that occurred in assembling program materials at the beginning of the program year due to administrative burdens and reductions in staffing that have occurred. In response to these challenges, program staff members have made efforts to release program materials sooner and re-assigned program functions to other staff and program partners. Program staff members' adaption to identified problems and changing circumstances will continue to serve the programs well in the future.

- **Increasing Building Code Requirements may Increase Marginal Cost of Above Code Efficiency Improvements:** The 2012 International Energy Conservation Code (IECC) became effective in the State of Illinois in January 2013. The new code requires that new buildings are constructed to higher efficiency standards than what was required by the previous 2009 IECC. As more efficiency improvements are required by code, efficiency improvements beyond code requirements may be more difficult to achieve and come at a higher marginal cost. The increasing requirements for energy efficient new construction may limit program activity in the New Construction Program because efficiency improvements above new code requirements may become cost prohibitive.

While interviews with program staff suggest that the program organization and efficiency have continually improved during the period the programs have operated, several recommendations have been developed based on interview findings, survey results, and overall analysis of program processes. These recommendations may provide strategic advantage in future program years:

- **Consider Providing Additional Communication Support to Increase Participation:** Program staff may consider offering additional communication support to participating public sector entities in order to encourage additional participation. This support would include helping participants develop press releases that emphasize the financial benefits of energy efficiency improvements. This might be a particularly useful strategy for the New Construction Program which has seen less program activity. Evaluations of other public sector programs have found that this form of communication support is well received because it provides recognition of the efforts of staff members of public sector organizations,

and it demonstrates to the local community that the school district or local government is using tax dollars wisely.[14]

- **Improve Documentation and Project Tracking Data:** Review of project documentation during the evaluation effort was complicated by project files containing multiple versions of documentation with different estimations of savings. Determining which documents were the final documents for the project was made more complicated by discrepancies between savings estimates in the documents and the savings in the project tracking data. The documentation should be organized such that there are documents that are clearly identified as the final documentation with saving estimations that correspond to the savings in the project tracking database. Improved transparency of documentation will reduce the administrative effort required to evaluate the program as well as the cost of the evaluation.

- **Better Documentation of Methods Used to Estimate Project Savings:** Improvement in the documentation of the savings estimation methodology will enable the identification of the reasons for discrepancies between program estimated savings and the realized savings. The methodology does not necessarily need to be documented for each project, but the formulas used and the "per unit" savings that are applied to project variables such as the number of lamps installed in different space types should be provided.

- **Target New Construction Projects Early in the Design Process:** Program staff reported that prospective participants in the New Construction Program must have their project plans completed before they can apply for incentive funds. This strategy helps to ensure that a larger share of applicant projects are completed and result in program savings. However, the downside is that once program plans are finalized, opportunities for deeper savings may have been missed. Program staff should continue to refer prospective applicants that are early in the design process to their program partner, SEDAC, but should also seek to market the program in ways that reach projects early in the design process. One way to do this is by cultivating relationships with architecture and design firms that develop public sector new construction projects.

## 4.4 Public Sector Custom and Standard Programs Participant Profile

Table 4-1 presents the number of applications received during the program year and the median expected savings. During PY4/GPY1, there were 245 Custom Incentives Program applications with median expected savings of 33,983 kWh and 9,428 Therms. There were also 642 Standard Incentives Program applications for completed projects during the program year. The median expected savings for Standard Incentives Program projects were 38,621 kWh and 1,944 Therms.

[14] *Rose, A., Stimmel, J., Oyhenart, J., and Ahrens, A. (2008). Breaking down silos: Bridging the communications and knowledge gap between departments to implement energy efficiency in the public sector. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

*Table 4-1 Median Expected Savings by Program*

| *Program* | *Number of Applications* | *Median Expected kWh Savings* | *Average Expected Therm Savings* |
|---|---|---|---|
| Custom Incentives Program | 245 | 33,983 | 9,428 |
| Standard Incentives Program | 642 | 38,621 | 1,944 |

Table 4-2 displays the range of incentives received for project applications and the median incentive amount. The median Custom Incentives Program electric incentive was $6,974 and the median natural gas incentive was $11,232. For the Standard Incentives Program the median electric incentive was $9,794 and the median natural gas incentive was $1,560.

*Table 4-2 Incentive Characteristics by Program*

| *Program* | *Electric Incentive Range* | *Natural Gas Incentive Range* | *Median Electric Incentive* | *Median Natural Gas Incentive* |
|---|---|---|---|---|
| Custom Incentives Program | $30 - $1,378,732 | $232 - $580,000 | $6,974 | $11,232 |
| Standard Incentives Program | $30 - $962,967 | $96 - $26,250 | $9,794 | $1,560 |

Figure 4-1 and Figure 4-2 display the share of applications by facility type for the Custom Incentives Program and Standard Incentives Program respectively. As shown in Figure 4-1, the majority of custom applications were for local government facilities (63%) and K-12 school facilities (25%). This was also the case for the Standard Incentives Program. For the Standard Incentives Program, 52% of applications were for local government facilities and 40% were for K-12 schools.

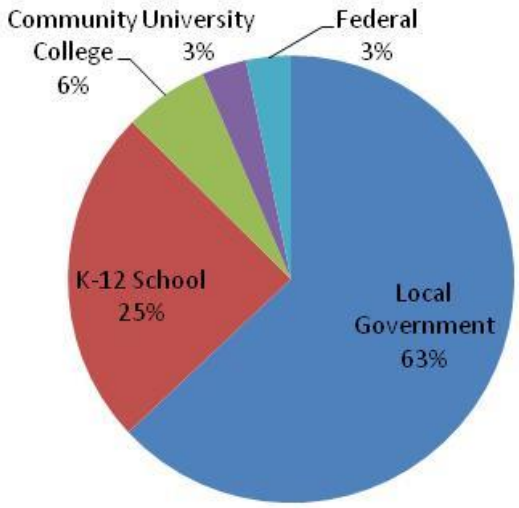


*Figure 4-1 Custom Incentives Program Applications by Facility Type*

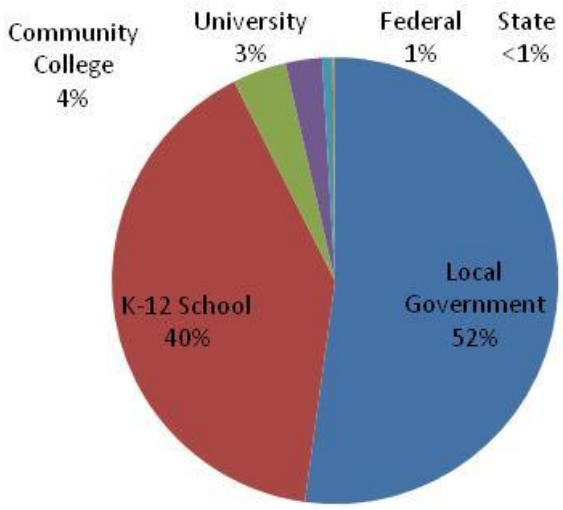


*Figure 4-2 Standard Incentives Program Applications by Facility Type*

The DCEO allows for local government and non-profit entities with direct relationships with municipalities to combine custom and standard incentive projects to simplify the application process and capture projects that would not be worthwhile as standalone projects. Of the applications for the Custom and Standard Incentives Programs previously discussed, 59 were municipal aggregation applications. As shown in Table 4-1 and Table 4-3, the median expected kWh savings for these applications was 44,281. The median expected therm savings were 4,560.

*Table 4-3 Median Expected Savings for Municipal Aggregation Applications*

| *Number of Applications* | *Median Expected kWh Savings* | *Median Expected Therm Savings* |
|---|---|---|
| 59 | 44,281 | 4,560 |

Table 4-4 displays the incentive range and median incentives for municipal aggregation projects. The median electric incentive was $9,819 and the median natural gas incentive was $7,136.

*Table 4-4 Incentive Characteristics for Municipal Aggregation Applications*

| *Electric Incentive Range* | *Natural Gas Incentive Range* | *Median Electric Incentive* | *Median Natural Gas Incentive* |
|---|---|---|---|
| $360 - $2,248,699 | $1,350 - $299,869 | $9,819 | $7,136 |

## 4.5 Public Sector Custom and Standard Incentives Programs Participant Outcomes

An online survey was conducted to collect data about participant decision-making, preferences, and opinions of the Custom and Standard Incentives Program. The programs offered incentives to public sector entities for a variety of measures, including lighting, compressed air, HVAC, refrigeration, and motor measures. In total, 193 participants who implemented a project under the program responded to the survey.

Information in this section is intended to characterize participant decision making behaviors and identify notable trends within participant responses. Some of the comments and issues raised by participants are anecdotal in nature and may reflect individual participant opinions. The Conclusions and Recommendations section of the Process Evaluation chapter provides an overall distillation of key findings from the process evaluation activities that were performed for the Custom and Standard Programs.

It is important to note that, while the survey results discussed below are used as inputs for the calculation of estimated free ridership, participant responses to individual survey items do not, in isolation from additional factors, infer specific levels of free ridership. Chapter 3 details the methodology used to estimate free ridership based on survey response data, while this chapter provides a qualitative discussion of participant responses.

### 4.5.1 How Participants Learn About the Program

Table 4-5 displays the participant responses regarding how they learned about the program. The percentages shown are percentages of survey respondents. Participants heard of the program in a wide variety of ways. The most frequently mentioned sources for learning about the program were equipment vendors or building contractors (34%), architects, engineers, or energy consultants (32%), the DCEO website (27%), or a conference, workshop, or seminar (27%). Twenty-three percent of respondents reported learning of the program from the Smart Energy Design Assistance Center (SEDAC), a DCEO partner in implementing and promoting its efficiency program. Relatively fewer participants reported hearing about the program from a DCEO representative (12%) or a program representative (15%). Twenty-six percent of survey respondents reported that they heard of the program from friends or colleagues, which suggests that word-of-mouth is playing an important role in increasing program awareness.

*Table 4-5 How Participant Decision Makers Learned about the Program*

| | *Response* | *Percent of Responses* (n=164)* |
|---|---|---|
| How did you learn of the Public Sector Energy Efficiency Program? | Equipment vendors or building contractors | 34% |
| | Architect, engineer, or energy consultant | 32% |
| | The DCEO website | 27% |
| | Attended a conference, workshop or seminar | 27% |
| | Friends or colleagues | 26% |
| | Past experience with the program | 24% |
| | Smart Energy Design Assistance Center (SEDAC) | 23% |
| | Received an information brochure on the Public Sector Energy Efficiency Program | 20% |
| | A utility representative | 18% |
| | Approached directly by a representative of the Public Sector Energy Efficiency Program | 15% |
| | A DCEO representative mentioned it | 12% |
| | An energy service company | 9% |
| | The Energy Resource Center (ERC) | 4% |
| | Other | 11% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

As shown in Table 4-6, more than half (55%) of respondents learned about the program before they began to plan their efficiency project, and 28% learned of the program during the project planning stage. Only two percent of respondents reported hearing about the program after the energy efficiency project had already been planned. Participants' awareness of the program during the early phases of project development suggests that there was opportunity for the incentives and information available through the program to influence the efficiency of equipment, scope of the project and timing of the project.

*Table 4-6 When Participant Decision Makers Learned about the Program*

| | *Response* | *Percent of Responses (n=163)* |
|---|---|---|
| When did you learn of the Public Sector Energy Efficiency Program? | Before planning for replacing the equipment began | 55% |
| | During your planning to replace the equipment | 28% |
| | Once equipment had been specified but not yet installed | 2% |
| | After equipment was installed | 2% |
| | Some other time | - |
| | Don't know | 12% |

### 4.5.2 Factors Affecting Public Sector Entity Participation

Participants were asked about the influence of the Public Sector Energy Efficiency Program on their decision to implement the energy efficiency equipment. Participants who installed multiple types of equipment were asked about the influence of the program separately for the different types of equipment they installed. Consequently, the number of responses to these questions exceeds the number of participants.

Participants reported that they had plans to implement 49% of the projects prior to participating in the program and that of these projects, 57% would have been completed even if they had not participated in the program. Although these respondents suggested that they would have completed the projects had they not participated in the program, the program may have still influenced the scope, timing, and level efficiency of the equipment chosen. Consequently, these responses do not, in isolation, designate a specific level of free ridership. Responses to individual survey items may be used to characterize certain aspects of a decision maker's program perspective or implementation behavior, but it is necessary to analyze the full set of a respondent's survey responses in order to estimate an accurate and reliable net-to-gross percentage. In addition to gauging participants' preexisting plans and intentions, it is important to consider how the program affected factors such as the timing and overall efficiency level of the project, Chapter 3 outlines the full net-to-gross estimation methodology that is applied to survey results for this evaluation.

Respondents who indicated that they had plans to implement a project were asked for how long they had their plans. As shown in Table 4-7, more than half of these participants stated that they had their plans for more than one year, suggesting that while they had prior plans to complete the projects, the availability of incentives may have allowed them to implement these plans. Moreover, participants reported that for 60% of the prior-planned projects they had not specified which energy efficiency measures would be included, which indicates that the information and incentives available through the program may have influenced the efficiency of the equipment.

*Table 4-7 Length of Time for Which Respondents Had Plans to Implement Energy Efficiency Measures*

| | *Response* | *Percent of Responses (n=89)** |
|---|---|---|
| For about how long have you had plans to implement these measures prior to finding out about the program? | Less than 6 months | 19% |
| | 6-12 months | 27% |
| | 1-2 years | 33% |
| | 3-5 years | 15% |
| | More than 5 years | 3% |
| | Don't know | 3% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

In order to gather further information about what motivated decision-makers to participate in the program, participants were asked whether the implemented project was recommended to them by a representative of the program or the DCEO, or by their partner SEDAC. Respondents indicated that for 28% of the projects implemented, a program or other DCEO representative had recommended the measures. Furthermore, respondents indicated that for 37% of the projects implemented, they probably or definitely would not have implemented the equipment had it not been recommended. Similarly, respondents indicated that for 22% of the projects implemented, a representative of DCEO's partner SEDAC had recommended the measures be installed, and for 29% of these projects, the measures would not have been implemented had they not been recommended. These findings emphasize the importance of non-monetary program influences on participant decision making. While the incentives may be a key factor in influencing participants to implement energy efficient equipment, informational resources are also important.

In cases where decision makers reported that they had prior plans for the projects, the Public Sector Energy Efficiency Program may have influenced various factors related to the measure installation. These factors include the timing of the installation, discussed above, as well as the quantity of units installed, and the energy efficiency of the installed equipment. Table 4-8 cross-tabulates the respondents who indicated that these factors were significantly affected by the program with whether the participant had plans to install equipment before participating. For the projects associated with prior planning, 43% stated that the quantity of installed units increased because of the program. Additionally, respondents indicated that the level of the energy efficiency of the equipment was increased for 25% of the projects and 56% of the projects were implemented earlier than they otherwise would have been. These findings indicate that even when participants were already planning to replace equipment, a large percentage of them would have installed fewer units, less energy efficient equipment, or installed the equipment later if they had not participated in the program.

*Table 4-8 Reported Program Influences on Installation Factors by Whether There Were Plans to Install Equipment*

| *Program Influence on Projects* | *Number of Responses** | *Had plans to install measure before participating* |
|---|---|---|
| Yes, program increased quantity of installed equipment | 38 | 43% |
| Yes, program increased efficiency of installed equipment | 22 | 25% |
| Yes, purchased and installed equipment/measure earlier than otherwise would have | 50 | 56% |

**Each decision maker may have provided more than one answer for these questions. Questions may have been repeated for each measure type implemented.*

### 4.5.3 Energy Efficiency Attitudes and Decision Making

Respondents were given a list of factors, shown in Table 4-9, and asked how important each of the factors is to their decision making about energy efficiency projects. A high percentage of respondents rated incentive or grant payments from DCEO as "very important" (86%), followed by past experience with energy efficient equipment (71%) and advice or recommendations from DCEO (62%). These results suggest that DCEO's financial and advisory involvement with these decision makers has been very influential in encouraging participants to participate.

*Table 4-9 Factors Influencing the Decision to Participate*

| *Energy Efficiency Decision Making Factor* | *Very Important* | *Somewhat Important* | *Only Slightly Important* | *Not Important at All* | *Don't Know* | *n* |
|---|---|---|---|---|---|---|
| Incentive or grant payments from DCEO | 86% | 12% | 2% | - | - | 163 |
| Past experience with energy efficient equipment | 71% | 28% | 1% | - | 1% | 164 |
| Advice and recommendations from DCEO | 62% | 28% | 7% | 1% | 2% | 164 |

Participant survey respondents were asked what kinds of energy efficiency policies and activities their organizations have in place. Their responses are shown in Table 4-10. Forty percent of the respondents stated that they have a staff member who is responsible for energy efficiency decisions and 32% percent of respondents indicated they have organizational policies that take energy efficiency into account. Thirteen percent of respondents have an energy management plan. Nearly one-third of respondents (31%) stated that they do not have polices or procedures for energy efficiency improvements.

*Table 4-10 Participant Energy Efficiency Policies and Activities*

| | *Response* | *(n=164)* |
|---|---|---|
| Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? | A staff member responsible for energy and energy efficiency | 40% |
| | Policies that incorporate energy efficiency in operations and procurement | 32% |
| | Do not have policies or procedures for energy efficiency improvements | 31% |
| | Active training of staff | 25% |
| | An energy management plan | 13% |
| | Other | 10% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

Respondents who indicated that they had an energy management plan were asked whether these plans included specific goals. All but one of the respondents who indicated that they had an energy management plan stated that the plan included goals. These respondents were asked to describe their goals. Nearly half of these participants stated that their plan was focused on reducing energy consumption or costs. Some of these participants indicated that these goals were numeric with reduction targets ranging from five percent to twenty percent. Some examples of these comments include:

*Save 20% energy by 2020.*

*To reduce energy by 15% by 2015.*

*To reduce energy consumption by 5% by 2015.*

Other respondents indicated that the goal of their energy management plan was focused on replacing specific equipment, such as HVAC or lighting equipment, with more efficient options. Finally, some respondents indicated that they are engaged in some form of monitoring their energy consumption.

Respondents were asked about their prior experience with purchasing and installing energy efficient equipment. The majority of respondents indicated that they did not have a prior history of making efficiency improvements without a financial incentive. Specifically, 17% of the respondents indicated that they had not purchased energy efficient equipment in the past, while 34% indicated that they had purchased this equipment, but that they applied for an incentive. In contrast to these participants, 40% of respondents indicated that they had purchased energy efficient equipment and did not apply for an incentive.

*Table 4-11 Incentives for Previous Equipment Purchased*

| | *Response* | *Percent of Responses (n=161)* |
|---|---|---|
| Has your organization purchased any energy efficient equipment in the last three years for which you did not apply for a financial incentive through an energy efficiency program? | Yes, purchased energy efficient equipment but did not apply for incentive. | 40% |
| | No equipment was purchased by organization. | 17% |
| | No, an incentive was applied for. | 34% |
| | Don't know | 9% |

### 4.5.4 Barriers to Energy Efficiency Improvements and Purchasing Processes

The literature on public sector decision making and procurement of energy efficient equipment identifies a number of barriers to purchasing and installing energy efficient equipment. These barriers include a lack of consideration of energy costs when making purchasing decisions, least cost purchasing rules preventing purchase of higher cost energy efficient equipment, the perception that high efficiency equipment is a luxury item, risk aversion generated by low cost purchasing requirements and transparency of decision making, and a lack of technical expertise.[15] Some of these barriers were identified by participants in the Custom and Standard Incentives Programs, as shown in Table 4-12. By far the most frequently mentioned barrier was insufficient funding to make the improvements, which 78% of respondents indicated was a barrier. Not having sufficient information on energy efficient equipment and practices was mentioned by 23% of participants. Although public sector organizations are often considered to have slow and difficult approval processes that hinder procurement of energy efficiency improvements, only 13% of respondents indicated that this was a significant barrier.

[15] *Barnes, P. and Wisniewski, E. J. (2000). Making it happen: Incorporating energy efficiency into government purchasing. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

*Harris, J., Brown, M., Deakin, J., Jurovics, S. Khan, A., et al. (2004). Energy-efficient purchasing by state and local government: Triggering a landslide down the slippery slope to market transformation. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

*Kunkle, R., Lutzenhizer, L. and Dethman, L. (2000). Influencing the purchase of energy-efficient products in public organizations: It's not as easy it looks. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

*Rose, A., Stimmel, J., Oyhenart, J., and Ahrens, A. (2008). Breaking down silos: Bridging the communications and knowledge gap between departments to implement energy efficiency in the public sector. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

*Table 4-12 Barriers to Making Energy Efficiency Improvements*

| | *Response* | *Percent of Responses (n=164)** |
|---|---|---|
| What barriers does your organization face in making energy efficiency improvements? | Insufficient funding for improvements | 78% |
| | Lack of information on energy efficient equipment and practices | 23% |
| | Current equipment that is too new to be replaced with more efficient equipment | 20% |
| | Incentive program time requirements | 18% |
| | Schedules that dictate when equipment is to be replaced or maintained regardless of efficiency levels | 13% |
| | Approval processes that are slow or make purchasing difficult | 13% |
| | Other | 5% |
| | Don't know | 4% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

When asked what their organization's approval process for equipment purchases was, most participants (85%) stated that the process depends on the amount of the purchase, as shown in Table 4-13. Additionally, about one-half of the participants stated that they follow state or federal procurement guidelines (55%) and a similar share said they have organizational procurement rules that they follow (50%). About one-third of participant respondents indicated that they are required to select the lowest bidder.

*Table 4-13 Respondent Approval Processes for Equipment Purchases*

| | *Response* | *Percent of Responses (n=164)** |
|---|---|---|
| What is the approval process for equipment purchases in your organization? | Depends on the amount of purchase | 85% |
| | Follow state or federal procurement guidelines | 55% |
| | Follow procurement rules specific to our organization | 50% |
| | An open bid is required | 49% |
| | Required to select lowest bidder | 32% |
| | Use a specific vendor | 7% |
| | Other | 3% |
| | Don't know | - |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

More than three-quarters of participants reported that their organization uses its operation and maintenance budget to fund energy efficiency improvements, as shown in Table 4-14. In contrast, few of the respondents indicated that their organizations have dedicated funding for energy efficiency projects. About one-third (37%) of participants indicated that they submit a capital request for energy efficiency projects.

*Table 4-14 How Energy Efficiency Improvements are Funded*

| | *Response* | *Percent of Responses (n=164)** |
|---|---|---|
| How does your organization fund energy efficiency improvements? | Funds are taken from operation and maintenance budget | 76% |
| | Through a capital request | 37% |
| | Dedicated funding for energy efficient projects | 14% |
| | Other | 19% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

Respondents who indicated that they had to submit a capital request for energy efficiency projects were asked if there was a specific dollar threshold for determining if a project required a capital request. Eight respondents indicated that there was not a threshold and 37 respondents indicated that there was a dollar threshold and provided additional information on the threshold level. Threshold levels reported by participants are shown in Figure 4-3. Thirty-eight percent of respondents indicated that the dollar amount that determined whether or not a project required a capital incentive request was at least $10,000 or more but less than $50,000. Another 30%of respondents stated that the threshold level was between $5,000 and less than $10,000. Very few respondents (3%) indicated that small projects costing less than $1,000 required a capital request.

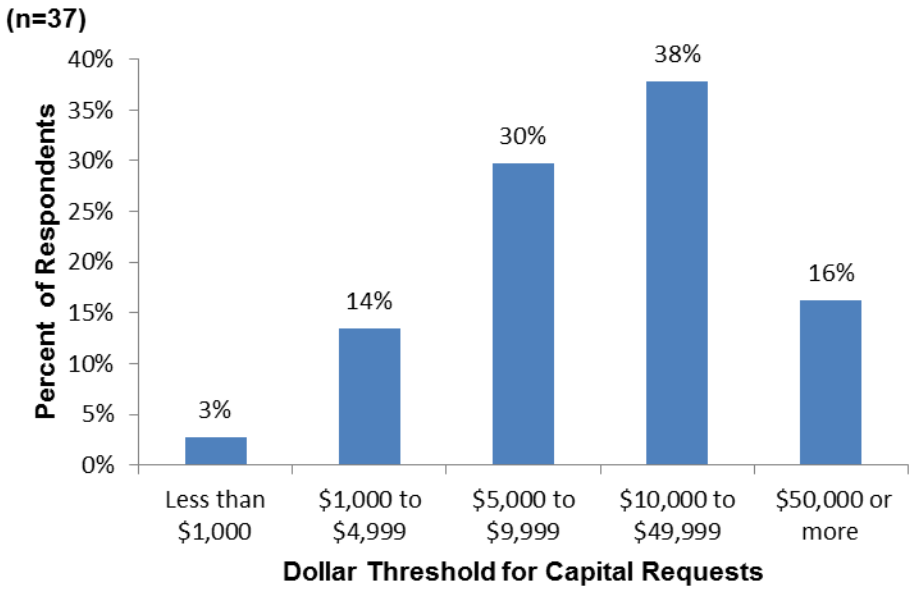


*Figure 4-3 Dollar Thresholds Determining when Projects Require Capital Requests*

The capital request process can act as a barrier to the implementation of energy efficiency projects in public sector organizations. One effect of the capital approval process on equipment procurement is to slow the process for equipment purchases. As shown in Figure 4-4, survey respondents reported that the length of time approvals take was notably shorter for equipment purchases in general than for capital approval requests. In addition to longer approval times, another barrier created by the capital approval request process is that other projects often take precedence over efficiency improvements.[16] Consequently, incentive dollars may encourage the implementation of energy efficiency improvements by reducing the project cost so that a capital request is not required to fund it.

[16] Zobler, N. and Hatcher, K. (2003). *Financing energy efficiency projects.* Government Finance Review.

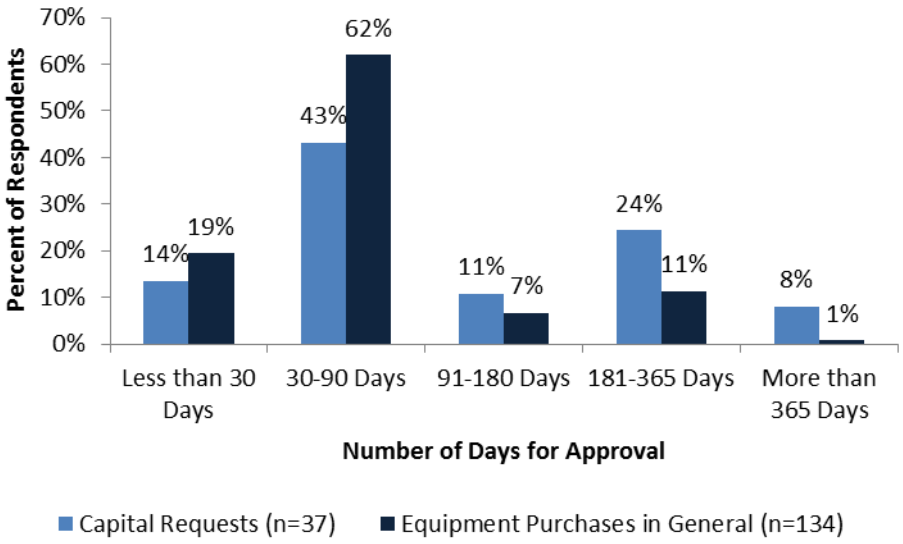


*Figure 4-4 Number of Days for Purchase Approval*

Program participants were asked whether or not they were able to utilize their incentive payments to fund additional energy efficiency improvements or other facility improvements. More than half of respondents (54%) stated that the funds could be used for energy efficiency improvements or to make facility improvements. Another 33% of respondents stated that the incentive payments went to the facilities' general operating fund. A few respondents (5%) stated that there were other requirements for the use of the incentive payments. The most common of these responses stated that the incentive payment had to be applied to the project for which the incentive was received. Other responses given include that the funds are returned to the capital projects fund, that it depends on the size of the project, and that the incentive is returned to the department that spent the funds.

*Table 4-15 Utilization of Incentive Payments*

| | *Response* | *Percent of Responses (n=164)* |
|---|---|---|
| Is your organization able to utilize incentive or grant payments you receive for energy efficiency improvements, or are the payments placed in the general revenue fund? | We are able to use the incentive payments for additional facility improvements including additional energy efficiency improvements | 54% |
| | Incentive payments return to the facility general operating fund | 33% |
| | Incentive payments go into the state general revenue fund | 1% |
| | Don't know | 6% |
| | Other | 5% |

To gauge the importance of incentive payments for public sector entities that require the return of incentive payments to a general operating fund or state general revenue fund, how the participants' organizations use incentive payments was cross-tabulated with decision makers' ratings of the importance of incentive payments. The results are shown in Table 4-16. Incentive payments were of equal importance regardless of how the organization uses them.

*Table 4-16 Importance of Incentives for Energy Efficiency Decision Making by Use of Incentive Payments*

| *Use of Incentive Payments* | *Importance of Incentive Payments for Decision Making about Energy Efficiency Projects* | | | | |
|---|---|---|---|---|---|
| | *Very Important* | *Somewhat Important* | *Only Slightly Important* | *Not Important at All* | *Don't Know* |
| Able to use incentive payments for facility improvements (n= 89) | 85% | 13% | - | - | - |
| Payments go to facility operation fund or state general fund (n=56) | 86% | 11% | 4% | - | - |

### 4.5.5 The Decision Makers

Respondents were asked how many decision makers were involved in energy efficiency planning at their facilities. As shown in Table 4-17, 36% of respondents reported that energy efficiency decisions are directly handled by one or two key people, while 35% said that decisions about energy efficiency improvements were made by a group or committee. Additionally, 27% of respondents reported that decisions were based on staff recommendations to a decision maker. Overall these responses suggest that the process for making decisions about energy efficiency improvements in participating public sector organizations involve multiple people rather than a single decision maker.

*Table 4-17 Decision Maker Characteristics*

| | *Response* | *Percent of Responses (n=163)* |
|---|---|---|
| How does your organization decide to make energy efficiency improvements for this facility? | Made by one or two key people | 36% |
| | Made by a group or committee | 34% |
| | Based on staff recommendations to a decision maker | 28% |
| | Other | 1% |

### 4.5.6 Where Decision Makers Get Their Information

Respondents were asked whom they rely on for information about energy efficient equipment, materials, and design features. Respondents were able to provide multiple responses and the percentages shown in Table 4-18 are percentages of respondents.

Program participants reported using a wide variety of sources for information about energy efficiency projects. The most commonly mentioned source for information about energy efficient equipment, materials, and design features were architects, engineers, or energy consultants. Sixty percent of responding participants stated that this was a source that they used. Equipment vendors or contractors were a source for 52% of the respondents. DCEO and its partner organizations SEDAC and the Energy Resource Center (ERC) were also important sources for information about energy efficient options. These sources include the DCEO website (35%), DCEO representatives (29%), SEDAC (28%), and the ERC (8%). Trade associations or business groups (23%) and trade journals or magazines (18%) were other common sources for information about energy efficiency. Twelve percent of respondents indicated that they use some other source. While many of these comments provided more specific information on what information sources respondents rely on, several also indicated that they use internal staff resources, board members, or planning commissions.

The sources used by participants for information on energy efficiency fits well with the program marketing model of relying on trade allies and program partners to promote the program.

*Table 4-18 Who Respondents Rely on for Information*

| | *Response* | *Percent of Responses (n=164)** |
|---|---|---|
| What are the sources your organization relies on for information about energy efficient equipment, materials and design features? | An architect, engineer, or energy consultant | 60% |
| | Equipment vendors or building contractors | 52% |
| | The DCEO website | 35% |
| | Friends and colleagues | 32% |
| | A DCEO representative | 29% |
| | Smart Energy Design Assistance Center (SEDAC) | 28% |
| | Trade associations or business groups you belong to | 23% |
| | A utility representative | 21% |
| | Brochures or advertisements | 21% |
| | Trade journals or magazines | 18% |
| | The Energy Resource Center (ERC) | 8% |
| | Other | 12% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

### 4.5.7 Financial Methods Used by Decision Makers

Table 4-19 displays the financial methods that respondents indicated using to review efficiency projects. Nearly all respondents (96%) used at least one financial method when deciding whether or not to make energy efficiency improvements. The two most common methods used were initial cost (71%) and simple payback (66%), followed by life cycle cost (38%), and internal rate of return (23%). The use of initial cost is consistent with most decision makers reporting that the initial cost of equipment was barrier to energy efficiency purchases. Additionally, more public sector entities may report using initial cost to evaluate projects because they lack knowledge about energy savings to use other methods, because funds used for equipment purchases may differ from those used for utility bill payment, or because lowest cost purchasing requirements preclude an assessment of the return on the investment in the equipment.

*Table 4-19 Methods Used to Evaluate Efficiency Improvements*

| | *Response* | *Percent of Responses (n=164)* |
|---|---|---|
| Which financial methods does your organization typically use to evaluate energy efficiency improvements for your facility? | Initial cost | 71% |
| | Simple payback | 66% |
| | Life cycle cost | 38% |
| | Internal rate of return | 23% |
| | None of these | 4% |

Participants who use simple payback as a criterion were asked how long of a payback period they typically require. Their responses are shown in Figure 4-5. Most respondents require a short to intermediate payback period. Thirty-one percent of respondents require a payback ranging from one to three years, while 41% specified a payback period ranging from three to five years. A handful (5%) of respondents would make energy efficiency investments if the payback period exceeded ten years.

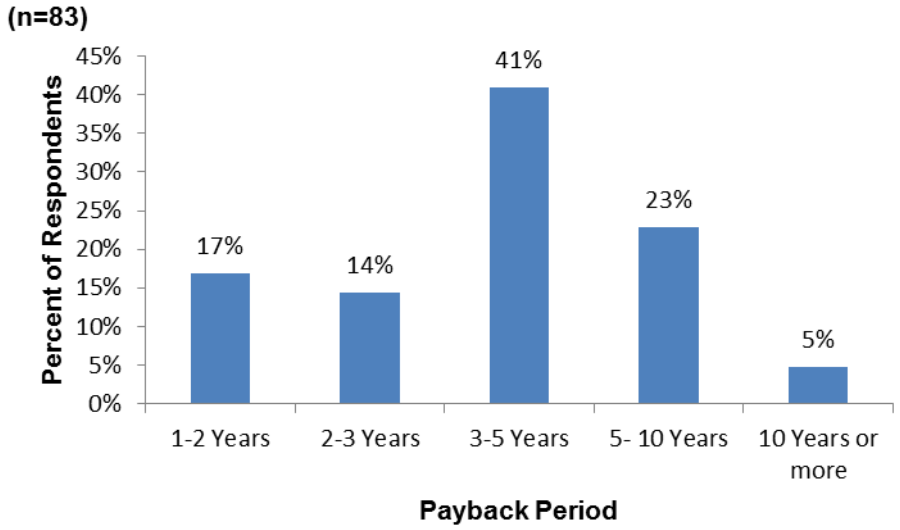


*Figure 4-5 Required Payback Period*

### 4.5.8 Participant Satisfaction with the Program

Respondents rated their levels of satisfaction with selected aspects of the program on a scale of very dissatisfied to very satisfied. Overall, satisfaction ratings were high, with few respondents reporting dissatisfaction. Table 4-20 shows the results. Respondents reported the greatest satisfaction with the performance of the equipment installed followed by the quality of work and information provided by their contractor. Eighty-eight percent of respondents were at least

somewhat satisfied with the incentive amount. Only 4% of the respondents were somewhat or very dissatisfied with the incentive amount.

Comparatively, participants reported being less satisfied with the savings on their monthly bills, which is typical of satisfaction survey results. Monthly savings may be concealed by other factors influencing energy demand. For example, if seasonal factors increase energy demands, it can be very difficult for participants to compare current energy use with previous consumption and determine accurate savings. Additionally, an efficiency improvement may result in significant savings but only account for a small share of total facility energy consumption. It is important to note that only one respondent reported being dissatisfied with their monthly savings and the majority (85%) of respondents was either very or somewhat satisfied with this aspect of their program experience.

*Table 4-20 Decision Maker Satisfaction with Selected Aspects of Program Experience*

| *Element of Program Experience* | *Very Satisfied* | *Somewhat Satisfied* | *Neither Satisfied nor Dissatisfied* | *Somewhat Dissatisfied* | *Very Dissatisfied* | *Not Applicable* | *n* |
|---|---|---|---|---|---|---|---|
| Performance of the equipment installed | 65% | 33% | - | - | - | 3% | 159 |
| Quality of the work conducted by your contractor | 60% | 30% | 1% | 1% | - | 8% | 160 |
| Information provided by DCEO Representative | 46% | 39% | 8% | - | - | 8% | 160 |
| Incentive amount | 41% | 47% | 8% | 1% | 1% | 3% | 159 |
| Elapsed time until you received the incentive | 40% | 48% | 8% | 1% | 1% | 3% | 159 |
| Effort required for the application process | 38% | 49% | 9% | 2% | - | 3% | 160 |
| Savings on your monthly bill | 41% | 44% | 9% | 1% | - | 4% | 158 |
| Information provided by Smart Energy Design Assistance Center (SEDAC) | 31% | 31% | 14% | 2% | - | 21% | 160 |
| Information provided by the Energy Resource Center (ERC) | 22% | 37% | 16% | 1% | - | 24% | 159 |
| Overall program experience | 51% | 45% | 2% | - | 1% | 1% | 156 |

Participants who reported dissatisfaction with a component of the program were asked why they were dissatisfied. Only four participants provided reasons for why they were dissatisfied with the program. The issues raised were that the application process was cumbersome, that the incentive levels were too low, or that the there was an issue with the contractors performance. The few criticisms received should be considered in the context of the generally high levels of satisfaction reported by participants.

Table 4-21 displays levels of satisfaction for selected elements of the program by the applicant type. There were too few responses to draw general conclusions about the satisfaction of federal, community college, and university participants and there was little difference in the reported

satisfaction of local government and K-12 school participants. K-12 participants did report somewhat higher levels of overall program satisfaction.

*Table 4-21 Project Decision Maker Satisfaction Levels by Decision Maker Facility Type*

| *Applicant Type* | *Effort required for the application process* | *Incentive amount* | *Savings on monthly bill* | *Elapsed time to receive incentive* | *Overall program experience* |
|---|---|---|---|---|---|
| Local Government (n= 102) | 4.2 | 4.3 | 4.3 | 4.3 | 4.4 |
| K-12 School (n= 55) | 4.3 | 4.4 | 4.4 | 4.4 | 4.7 |
| Community College (n= 3) | 4.0 | 4.0 | 3.3 | 3.3 | 3.7 |
| Federal (n= 2) | 4.0 | 5.0 | 4.5 | 4.5 | 4.5 |
| University (n= 2) | 4.5 | 4.0 | 3.0 | 3.0 | 4.0 |

In addition to their satisfaction, respondents were also asked about whether or not the measure or measures they implemented met their expectations. More than half of respondents (56%) indicated that the energy efficiency measure had met their expectations, while another 35% stated that it had exceeded their expectations. Only four participants reported that the measures did not meet or mostly met their expectations. Participants were asked why the measure did not meet their expectations. One participant noted a problem with the controls on the equipment that was implemented, while two other comments made did not pertain to the measure installed but to program processes previously discussed as reasons for participant dissatisfaction.

*Table 4-22 Energy Efficiency Measure Satisfaction of Participant Expectations*

| | *Response* | *Percent of Respondents (n=162)* |
|---|---|---|
| Did the energy efficiency measure meet your expectation? | My expectations were exceeded | 35% |
| | My expectations were met | 56% |
| | My expectations were mostly met | 1% |
| | My expectations were not met | 1% |
| | Don't know | 6% |

### 4.5.9 Installation and Incentives

Very few participants reported problems with receiving the incentive checks or their dollar amount. As shown in Table 4-23, 91% of survey respondents indicated that the incentive check was in the expected amount while 8% reported not knowing if it was the expected amount (not shown). Only one participant said the check was not what was expected. A few participants (2%) reported issues with receiving the incentive check. These respondents indicated that there were delays in the process or that they had not yet received the check.

*Table 4-23 Experience with Incentive Delivery*

| *Question* | *Percent of Respondents Saying Yes* | *n* |
|---|---|---|
| Was the incentive check the expected amount? | 91% | 159 |
| Issues receiving incentive check? | 2% | 160 |

Participant experience with project implementation is summarized in Table 4-24. Eighty-eight percent of the respondents felt that the implementation went smoothly, while 11% indicated that it was a mostly smooth process.

*Table 4-24 Experience with Project Implementation*

| *Question* | *Yes* | *For the most part* | *No* | *Don't know* | *n* |
|---|---|---|---|---|---|
| Did the implementation go smoothly? | 88% | 11% | 1% | 1% | 160 |
| Do you feel you got a quality installation? | 96% | 3% | 1% | 1% | 160 |
| Did the incentive agreement that you received meet your expectations? | 95% | - | 2% | 3% | 161 |

Participants who reported that the project implementation did not go smoothly were asked what was problematic with the process. Four of the respondents stated that they had problems with the project timing or meeting program time requirements. Some examples of these comments include:

> *Tight timelines restricted the project to be completed only during the summer break. We are [a] K-12 public school.*

> *[We were] Very rushed due to program expiration.*

Difficulty meeting program requirements was another problem mentioned by a few participants. Participants indicated that they were asked for additional documentation that was not required, that the lighting survey was too complex, or that there were too many requirements to participate.

Two participants stated that there were problems with their contractor or vendor such as a the vendor failing to complete the program paperwork. Another three respondents indicated that they had difficulty specifying equipment or planning the project. These comments were:

> *Library lights were insufficient and had to be revised. Took longer than 4 months to accomplish all of this.*

*[Project was] Not planned well.*

*The recommended lamp did not match the existing ballast so the project was completed in a different location.*

Nearly all participants indicated that they thought that they got a quality installation (96%) and that the incentive agreement met their expectations (96%). Most participants who reported that they did not get a quality installation stated that there were problems with the equipment after installation such as controls not functioning properly. One of these respondents indicated that the installer was called back multiple times to deal with issues.

Overall, program participants reported few problems with the participation process. There were a few anecdotal reports of problems that occurred during the participation process, but these did not occur frequently enough to suggest systematic problems with program delivery.

### 4.5.10 Pre- and Post-Inspections

Participants were asked whether or not pre- and post-inspections were performed at their facilities. Eleven percent of the respondents indicated that their facility received a pre-inspection. The pre-inspections consisted of facility walk-throughs and surveys of equipment, audits, and analysis of the incentives and the implementation plan. Of the 18 respondents whose facility received a pre-inspection, four (24%) stated that the project design changed as a result of the pre-inspection. Two of these participants made general statements about the scope of the project being increased. The other two participants stated that lighting was added to the project and that a server room was enclosed and received a duct work re-design.

Twenty-four percent of respondents reported that a post-inspection was performed at their facility. Post-inspections consisted of facility walk-throughs, verification of equipment installation, photographs of installed equipment, videos, and answering questions about the project. Three of the respondents (8%) stated that the incentive amount changed as a result of the post-inspection. These participants stated that the incentive changed because the post-inspection count was used to calculate the incentive, that a few improvements that had been missed initially and were added to a later grant, and that the contractor completed different work than was originally specified.

*Table 4-25 Pre- and Post-Installation Inspections*

| *Question* | *Percent of Respondents Saying Yes* | *n* |
|---|---|---|
| Did anyone come to your facility to do a pre-inspection? | 11% | 161 |
| Did anything change in the design as a result of the pre-inspection? | 24% | 17 |
| Did anyone come to your facility to do a post-inspection? | 24% | 159 |
| Did anything change in the incentive amount as a result of the post-inspection? | 3% | 38 |

### 4.5.11 Spillover and Future Energy Efficiency Plans

Some participants reported installing energy efficient equipment after participating in the program that they did not receive an incentive for. As shown in Table 4-26, 21% of survey respondents reported that they purchased additional equipment similar to what they installed through the program since participating. Additionally, 12% of respondents stated that they had purchased energy efficient equipment that was dissimilar to what they implemented through the program. Most participants reported that they installed lighting equipment, HVAC equipment, and water heating equipment. Additionally, two participants reported making building envelope improvements (air sealing and windows). To the extent that the program influenced the implementation of this equipment, it may have resulted in spillover savings attributable to the program. Spillover savings are discussed in more detail in the net savings chapter section 3.

*Table 4-26 Additional Energy Efficiency Projects and Future Energy Efficiency Plans*

| *Question* | *Percent of Respondents Saying Yes* | *n* |
|---|---|---|
| Since participating in the Public Sector Energy Efficiency Program, have you implemented any additional energy measures similar to those you implemented through the program that you did not apply or receive an incentive for? | 21% | 159 |
| Since participating in the Public Sector Energy Efficiency Program, have you implemented any additional energy efficiency equipment that was not similar to those you implemented through the program that you did not apply or receive an incentive for? | 12% | 160 |
| Given your experience with the Public Sector Energy Efficiency Program, would you buy energy efficient equipment in the future even if financial incentives or grants for such equipment were not being offered through the Public Sector Energy Efficiency Program? | 67% | 159 |

### 4.5.12 Participant Recommendations and Overall Impressions

When responding to open-ended questions regarding their experiences with the program, some participants provided suggestions for potential program improvements. One suggestion was for the program to offer higher incentive levels such as those that have been offered during special promotional periods (e.g., higher incentives for outdoor lighting during the "Spring Fling") or to remove the caps placed on incentive limits. Although participants prefer higher incentives, DCEO incentives currently compare favorably to incentives offered by utilities in Illinois and participants reported satisfaction with the incentive amount they received. Moreover, increasing incentives could negatively impact the cost effectiveness of the programs. Higher incentives should be considered when there is a need to increase program activity either overall or for specific measures.

Two participants made recommendations regarding the program paperwork. One of these recommendations was to make the paperwork more "intuitive." The other participant noted that the application numbers do not match the grant agreement numbers and that the incentive checks are marked with the grant agreement number but not the application number. The participant would prefer if the checks could be marked with the application number.

One participant stated a preference to allow to projects span multiple school fiscal years because most construction occurs during the summer. This change would allow projects to be approved in the winter or early spring, completed over the summer, and payment sent in the fall.

Two participants recommended adding incentives for other measure types, specifically, upgrades to building automation systems and linear LEDs.

Several participants commented on the ways that the program enabled them to implement energy efficiency improvements. These comments referred to how the financial incentives allowed them to implement the energy efficient equipment as well as how the information provided by the program helped with the selection of the appropriate energy saving equipment. Some examples of these comments are:

> *[Entity Name] was very pleased with DECO and SEDAC. Both groups provided an extraordinary amount of value and help [Entity Name] initiate additional energy efficiency projects. [Entity Name] leverages incentives to increase scope of energy efficiency projects. It also allows us to replace fixtures that wouldn't meet our 5 year ROI. Furthermore, the assistance SEDAC provides and the incentives DECO provides cause [Entity Name] to prioritize spending capital dollars in Chicago instead of other areas of the country. [Entity Name] couldn't be happier with these two organizations and hopes to do additional projects with them.*
>
> *Thank them for all the help and ideas they gave us to reduce operating costs.*
>
> *Thank you for this program. It has helped us live our commitment to the environment and achieve our goals of reducing energy consumption and saving the tax payers money.*
>
> *We would not [have] been able to complete the number of energy efficiency projects without the incentives that are available. Thank-you so much for this program.*
>
> *Working at a school district where budget shortfalls seem to be the norm, this program helps tremendously with the decision to go forward when faced with a project or equipment replacement. I value the ongoing guidance and expertise of DCEO/SEDAC and view them as "Partners" within my group. The information and support helps me make the right decision and reaffirms what we are doing as energy efficiency professionals. Keep it up DCEO !!!*

Most of the comments made by respondents offered praise and gratitude for the program. Some examples of these comments are:

> *Great program; Thanks!*
>
> *Strength of the program is the people who advise us and the suggestions they make as you work through the project*
>
> *The DECO programs are great. We just finished a lighting project for the City that would not have been possible without the help of the DECO.*
>
> *Thank you. Being in the public sector, it is always helpful to receive any type of incentive possible for the community's benefit.*

## 4.6 Public Sector Custom and Standard Incentives Programs Operation Perspective

Interviews were conducted with Custom and Standard Incentives Program staff in order to gain perspectives on program operations. The interviews were designed to center on topics related to experiences with the program. Interview topics also included program recommendations, program satisfaction, and recent trends in the energy efficiency market environment.

In order to gather information regarding the operational efficiency and program delivery process for the Custom and Standard Incentives Programs, in-person interviews were conducted with key DCEO staff members. These interviews were focused on overall process effectiveness and identifying potential improvements for future program activities. DCEO interview participants included managerial staff, program administrators, and program specialists.

Respondents discussed their perspectives on how the program has taken shape since the prior program cycle. Interview questions related to the respondents' individual program roles as well as their perceptions of overall program strengths, weaknesses, and opportunities for the future.

### 4.6.1 Summary of Interview Findings

Key trends and issues addressed by respondents include:

- **Timing of the Program Year has Delayed Launch:** The EEPS program year runs from June 1st to May 31st and the DCEO fiscal year runs from July 1st to June 30th. At the end of the fiscal year, DCEO staff resources are focused on meeting end of the year administrative duties. The need to allocate resources to these duties limits staff availability for EEPS administrative tasks at the start of the EEPS program year, including the development and release of program guidelines and processing of applications. In the past this has delayed the launch of the new program year beyond the calendar start date, however, program staff members have made a concerted effort to reduce the delay in the launch of the program where possible.

- **Projects must be Completed in the Year Incentives are Applied For:** Program staff members have generally required that participants applying for custom and standard incentives complete the projects in the program year that they apply for funds. In order to accommodate participants budgeting cycles, processes, or other delays in the implementation of projects, the DCEO is considering the development of administrative processes that would allow projects to span multiple program years. An example of a process being considered is allowing participants to apply for a renewal of the application rather than resubmitting the application.

- **Differences in how Natural Gas and Electric Savings Goals are Set and Met:** Procedures for setting energy saving goals differ for electric and natural gas savings. For electric savings, there are statewide goals set for reductions in energy consumption that are to be met jointly by the utilities and the DCEO. The authorizing legislation for the efficiency programs does not specify DCEO's share of the savings target for electric savings. Rather, the utilities and

DCEO are to negotiate DCEO's goals for energy savings. In contrast, DCEO is assigned a target of meeting 20% of the statewide natural gas savings goals.

There are also differences in how electric and natural gas savings are accrued to meet the goals. DCEO staff report that if they exceed the annual electric savings goals, the savings that exceed the goal cannot be counted towards meeting the goal for the following year. In contrast, natural gas savings beyond the annual goal can be carried over to the following year.

DCEO staff members expect changes to the energy efficiency goals during the next three-year planning cycle. Program goals for the next three-year planning period will likely have to be renegotiated because caps included in the authorizing legislation will likely begin to limit the funds available for efficiency improvements.

- **Programs have Flexibility to Make Changes during the Program Year:** DCEO staff report that they have considerable flexibility for making adjustments to the program during the program year. Most changes have to be presented to the Illinois Stakeholder Advisory Group but program staff can make small adjustments to incentive levels or measure offerings. Additionally, the Custom and Standard Incentives Programs share a budget so that funds can be allocated between the programs based on demand. One of the ways the DCEO uses this flexibility is to offer higher incentive levels for limited periods of time when program activity is low.

- **Program is Primarily Marketed through Trade Allies:** The marketing of the Custom and Standard Incentives Programs is primarily done by trade allies. The use of trade allies as the primary means to market nonresidential programs is a common and effective approach to marketing nonresidential programs. Trade allies typically have a network of participant contacts to which they can provide information about the program. Additionally, trade allies can provide individualized consultations with prospective participants about the benefits of energy efficiency improvements and how the programs can help offset the cost of those improvements.

  Program staff members are also seeking to engage in other outreach activities that focus on industry associations, school boards, and local municipal meetings. Additionally, the DCEO hosts a trade ally rally where trade allies and public sector decision makers can learn about the programs.

- **Program Strengths:** Program staff members identified a number of strengths of the Custom and Standard Incentives Programs during the interviews. One of these strengths was the partnerships they have created with other organizations including the Smart Energy Design Assistance Center (SEDAC) at the University of Illinois at Urbana-Champaign, the Energy Resources Center (ERC) at the University of Illinois at Chicago, and the Midwestern Energy Efficiency Alliance (MEEA). Staff members at these institutions are experts in their fields and support the DCEO programs by offering implementation services, technical expertise,

marketing, outreach, training, and education. This support enhances the implementation and delivery of the DCEO programs and helps program participants identify energy efficiency opportunities in their facilities. Another program asset identified by staff members is the recent development of performance contracting to provide an alternative financing source for prospective participants. Performance contracting arrangements may allow public sector entities to participate in the programs despite financial constraints.

- **Program Challenges:** Program staff members also identified a number of challenges that the programs face. One of the challenges that they noted was the effect that the rate caps included in the energy efficiency authorizing legislation. The rate caps limit the amount that utility participants can be charged to fund energy efficiency improvements and consequently limit the funds available to make energy efficiency improvements. Program staff will have to consider the impact of the funding limitations on the programs offered and the expected level of activity.

  Another challenge identified by program staff members are the financial constraints faced by public sector entities. In particular, schools and local governments have financial constraints that limit the resources they have available for efficiency improvements. While most of the decision makers in these organizations are excited by the energy and cost saving benefits to participating in the programs, these public sector organizations cannot afford the initial capital expenditure required for major projects. This insight by program staff is substantiated by participant survey responses that indicated that insufficient funding was a significant barrier to participation. The challenge faced by staff members is to adjust incentive levels and provide other financial arrangements to encourage participation and meet savings goals while maintaining program cost effectiveness.

  The operations and delivery of the Custom and Standard Incentives Programs have also been challenged by staffing and administrative changes resulting from funding constraints. For example, the programs no longer employ eight staff members who were hired with funds provided by the American Recovery and Reinvestment Act (ARRA). Additionally, during the program year, the program Director of Outreach and Marketing left and the position has not been filled since. To fill this gap in staffing, program administrators split the marketing function among the staff and relied more heavily on external partners and the trade ally network to provide additional outreach efforts.

  Potential energy savings in street lighting is another challenge, as well as an opportunity, identified by program staff. Staff stated that there are large potential savings in street lighting but that much of the street lighting is owned by the utilities and therefore not within the scope of the DCEO programs. The challenge lies in developing a program that would target street lighting eligible for DCEO incentives.

## 4.7 Public Sector New Construction Program Participant Profile

Table 4-27 presents the median electric and natural gas expected savings for the six new construction projects completed during the program year. The median expected kWh savings were 287,141 and the average expected therm savings were 2,443.

*Table 4-27 Median Expected Savings for New Construction Projects*

| *Number of Applications* | *Median Expected kWh Savings* | *Median Expected Therm Savings* |
|---|---|---|
| 6 | 287,141 | 2,443 |

Table 4-28 displays the incentive characteristics for the new construction applications. The median electric incentive amount was $39,422 while the median natural gas savings incentive was a much smaller $1,954.

*Table 4-28 Incentive Characteristics for New Construction Projects*

| *Electric Incentive Range* | *Natural Gas Incentive Range* | *Median Electric Incentive Amount* | *Median Natural Gas Incentive Amount* |
|---|---|---|---|
| $17,010 - $80,388 | $528 - $3,862 | $39,422 | $1,954 |

One half of the new construction projects were completed by local governments and one-half were completed by K-12 schools.

## 4.8 Public Sector New Construction Program Participant Outcomes

An online and telephone survey was conducted to collect data about participant decision-making, preferences, and opinions of the Public Sector New Construction Program (New Construction Program), which offers incentives for increasing energy efficiency in new construction projects above code requirements. Multiple attempts were made to contact all program participants but only two decision makers responded to the survey.

Information in this section is intended to characterize participant decision-making behaviors and identify notable trends within participant responses. Some of the comments and issues raised by participants are anecdotal in nature and may reflect individual participant opinions. The Conclusions and Recommendations section of the Process Evaluation chapter provides an overall distillation of key findings from the process evaluation activities that were performed for the New Construction Program.

It is important to note that, while the survey results discussed below are used as inputs for the calculation of estimated free ridership, participant responses to individual survey items do not, in isolation from additional factors, infer specific levels of free ridership. Chapter 3 details the methodology used to estimate free ridership based on survey response data, while this chapter provides a qualitative discussion of participant responses.

### 4.8.1 How Participants Learn About the Program

Program participants reported hearing of the program from friends and colleagues; architects, engineers, or energy consultants; and equipment vendors or building contractors. Additionally, one of the respondents reported hearing about the program from a school board member.

One of the survey respondents found out about the program before planning the project, while the other learned of the program once construction was started but before it was completed. Generally, it is more beneficial from an energy savings standpoint if participants learn of new construction programs earlier in the planning stages rather than later. Learning of the program early in the project planning process provides greater opportunity for the program to impact the project design and the efficiency measures incorporated. At later points of the design and construction process, the opportunities are more limited and changes to the design that incorporate elements to improve energy efficiency may become prohibitively expensive.

### 4.8.2 Factors Affecting Public Sector Entity Participation

Participants were asked questions regarding the influence of the New Construction Program on their decision to design and construct buildings with greater efficiency than what is required by code. Neither of the program participants reported that they had plans to build to the efficiency level of the completed projects prior to participating in the program. This suggests that the program influenced the final efficiency level of the buildings.

In order to gather further information about what motivated participants to incorporate the efficiency measures, participants were asked whether the above code efficiency improvements were recommended to them by a representative of the program or the DCEO or by their partner SEDAC. Both participants reported that they had received recommendations from the DCEO, one of whom reported that they probably would not have built to the same level of efficiency had they not received the recommendation. One of the respondents also reported that they had received advice or recommendations from SEDAC but that the project would have attained the same level of efficiency without this advice. These findings suggest that for one of the two participants, the informational assistance provided by the program influenced the efficiency of the completed project.

### 4.8.3 Participant Satisfaction with the Program and the Participation Process

Overall respondents reported that they were somewhat satisfied with the program. One of the participants indicated dissatisfaction with the performance of the equipment installed and the quality of the work performed by the contractor. This respondent stated that the geothermal units were unattractive and noisy. Neither respondent reported problems with the application, with the incentive check processing time, or the dollar amount of the incentive. One of the participants noted a problem with the implementation of the project and referred to the previously mentioned issue with the geothermal units.

Overall, neither participant noted any significant problems with the program delivery.

## 4.9 Public Sector New Construction Incentive Program Operations Perspective

Interviews were conducted with program staff in order to gain perspectives regarding program operations and overall market trends. The interviews were designed to center on topics related to experiences with the program. Interview topics also included program recommendations, program satisfaction, and recent trends in the energy efficiency market environment.

In order to gather information regarding the operational efficiency and program delivery process for the New Construction Program, in-person interviews were conducted with key members of both utility and implementer program staff. These interviews were focused on overall process effectiveness and identifying potential improvements for future program activities. DCEO interview participants included the program manager and administrator.

Respondents discussed their perspectives on how the program has taken shape since the prior program cycle. Interview questions related to the respondents' individual program roles as well as their perceptions of overall program strengths, weaknesses, and opportunities for the future.

### 4.9.1 Summary of Interview Findings

Key trends and issues addressed by respondents include:

- **Program Saving Targets:** Goals are set internally and are based on the budgeted dollar amount. Unlike the Public Custom and Standard Incentives Programs, the New Construction Program does not have energy saving goals mandated in the three year plan. DCEO program staff estimate the savings targets for the program from the amount of budget allocated to the program.

- **Applicant Project Plans must be Complete to Apply for Funds:** Project design plans must be complete to qualify for the New Construction Program. DCEO program staff stated that this is a strategy to minimize the number of projects that do not get completed; if the design phase is complete there is a greater chance that the project will be completed and result in energy savings. In some cases program applicants have already incorporated some energy efficiency design features when they apply for the program while others have completed plans but are looking to incorporate beyond-code energy saving measures in order to qualify for the program.

  The requirement that applicants have completed plans may limit the savings realized by New Construction Program projects. A study of best practices for new construction programs conducted at the national level found that programs that influence projects earlier in the design process have greater success in identifying and maximizing energy savings potential, with fewer interruptions to project schedules.[17] To limit the missed savings opportunities resulting from this planning requirement, DCEO's strategy is to refer participants in the early

[17] Quantum Consulting Inc. (2004). *Non-Residential New Construction Best Practices Report.* EEBestPractices.com.

design stages to DCEO's partner, the Smart Energy Design Assistance Center (SEDAC). SEDAC works with the applicants to help them incorporate energy efficient equipment and design features into the projects and to identify incentive opportunities available through DCEO.

- **Program Activity Remains Low:** Program staff members noted that there has been relatively little program activity due to the economic climate and lack of public funds for new construction projects. However, another factor may be a lack of incentives to attract design firms and developers to the program. Currently, the program can only legally provide EEPS funds to public sector entities. If the program were designed in a way that allowed for third party design firms and developers to split the incentive, there may be a greater pool of projects with higher energy savings potential being brought to the program. Not only is this a way to incentivize the private sector to actively market the program, but it also encourages participation earlier in the design process. This ensures that the most cost-effective measures and design techniques are identified and incorporated early on.

- **Community Colleges and Schools are Most Active in the Program:** According to DCEO staff, schools and community colleges have been most active in the new construction program. These organizations participate in greater numbers because education boards and school districts often have dedicated grant administration staff that are responsible for identifying and pursuing private, state, and federal sources of funding.

- **New Construction Grant Funds are dispersed at the Time of Project Completion:** Projects often span multiple program years and participants design beyond the building code in place at the time of application. Participants do not amend project plans if building codes change prior to project completion and incentive funds are based on building above the energy code that was in effect during the year the project was approved. Multiple year planning and construction horizons are typical of New Construction programs nationwide and are essential for the continuity and stability of a longer-term program.

# 5. Conclusions and Recommendations

The interviews and surveys that were conducted with EPY4/GPY1 participants in the Custom and Standard Incentives Programs, and participants in the New Construction Program suggest that the programs were effective in their delivery and operations.

### 5.1.1 Key Conclusions

The following presents a selection of key findings from the most recent program:

- **High Program Satisfaction:** PY4/GPY1 participants noted high levels of satisfaction with the programs. Few problems were noted regarding the implementation of the efficiency measures, the application process, the incentive amount, or the receipt of the incentive. In many of the open-ended responses, several participants stated that they were satisfied with the program and grateful for the assistance.

  Participant satisfaction is an important asset for the programs. Public sector organizations tend to collaborate and share information and other resources. Satisfied participants are more likely to encourage their colleagues to participate in the program. This word of mouth effect will be an important driver of future program activity.

- **Lack of Available Funding is an Important Barrier:** The barrier to making energy efficiency improvements most frequently mentioned by participants was a lack of financial resources. This suggests that the public sector organizations who participated during the program year were encouraged to implement efficiency improvements because the incentives offset the initial cost. The reduced cost could facilitate the completion of projects because public sector entities by allowing projects to meet budget requirements, the allowing projects to comply with least cost purchasing rules, or by lowering project costs below thresholds that require projects to be funded with a capital request. Regarding the last point, capital requests for efficiency improvements often have to compete for funding with other higher priority projects and thereby may not receive funding because other priorities take precedence. Moreover, participants reported that the approval time for capital requests was longer than the average approval time for equipment purchases in general. The hazards of the capital approval process may negatively impact public sector entities ability to implement efficiency improvements and incentive payments may allow projects to avoid this process.

  The informational resources provided through the programs may also have increased the implementation of energy efficient technologies by the public sector entities. One-fifth of survey respondents stated that lack of information on efficient technologies and practices was a barrier to implementing energy efficiency improvements. The DCEO and its partners provide prospective participants with a number of informational resources that can help fill this knowledge gap in public sector entities and encourage the adoption of efficient equipment.

- **Program Staff are Improving Program Administration:** Interviewed program staff discussed program operation and management challenges that have been identified as well as solutions to address these problems. Examples of challenges the program has faced were delays that occurred in assembling program materials at the beginning of the program year due to administrative burdens and reductions in staffing that have occurred. In response to these challenges, program staff members have made efforts to release program materials sooner and re-assigned program functions to other staff and program partners. Program staff members' adaption to identified problems and changing circumstances will continue to serve the programs well in the future.

- **Increasing Building Code Requirements may Increase Marginal Cost of Above Code Efficiency Improvements:** The 2012 International Energy Conservation Code (IECC) became effective in the State of Illinois in January 2013. The new code requires that new buildings are constructed to higher efficiency standards than what was required by the previous 2009 IECC. As more efficiency improvements are required by code, efficiency improvements beyond code requirements may be more difficult to achieve and come at a higher marginal cost. The increasing requirements for energy efficient new construction may limit program activity in the New Construction Program because efficiency improvements above new code requirements may become cost prohibitive.

### 5.1.2 Program Recommendations

While interviews with program staff suggest that the program organization and efficiency have continually improved during the period the programs have operated, several recommendations have been developed based on interview findings, survey results, and overall analysis of program processes. These recommendations may provide strategic advantage in future program years:

- **Consider Providing Additional Communication Support to Increase Participation:** Program staff may consider offering additional communication support to participating public sector entities in order to encourage additional participation. This support would include helping participants develop press releases that emphasize the financial benefits of energy efficiency improvements. This might be a particularly useful strategy for the New Construction Program which has seen less program activity. Evaluations of other public sector programs have found that this form of communication support is well received because it provides recognition of the efforts of staff members of public sector organizations, and it demonstrates to the local community that the school district or local government is using tax dollars wisely.[18]

- **Improve Documentation and Project Tracking Data:** Review of project documentation during the evaluation effort was complicated by project files containing multiple versions of

[18] *Rose, A., Stimmel, J., Oyhenart, J., and Ahrens, A. (2008). Breaking down silos: Bridging the communications and knowledge gap between departments to implement energy efficiency in the public sector. American Council for an Energy-Efficient Economy Summer Study Proceedings.*

documentation with different estimations of savings. Determining which documents were the final documents for the project was made more complicated by discrepancies between savings estimates in the documents and the savings in the project tracking data. The documentation should be organized such that there are documents that are clearly identified as the final documentation with saving estimations that correspond to the savings in the project tracking database. Improved transparency of documentation will reduce the administrative effort required to evaluate the program as well as the cost of the evaluation.

- **Better Documentation of Methods Used to Estimate Project Savings:** Improvement in the documentation of the savings estimation methodology will enable the identification of the reasons for discrepancies between program estimated savings and the realized savings. The methodology does not necessarily need to be documented for each project, but the formulas used and the "per unit" savings that are applied to project variables such as the number of lamps installed in different space types should be provided.

- **Target New Construction Projects Early in the Design Process:** Program staff reported that prospective participants in the New Construction Program must have their project plans completed before they can apply for incentive funds. This strategy helps to ensure that a larger share of applicant projects are completed and result in program savings. However, the downside is that once program plans are finalized, opportunities for deeper savings may have been missed. Program staff should continue to refer prospective applicants that are early in the design process to their program partner, SEDAC, but should also seek to market the program in ways that reach projects early in the design process. One way to do this is by cultivating relationships with architecture and design firms that develop public sector new construction projects.

# Appendix A: Survey Instrument for Decision Maker Survey

1. Name of Public Entity

2. Your name (please correct if necessary)

3. What was your role in the decision making process to implement the [Project Description]?
   ( ) Main decision maker
   ( ) Assisted with the decision
   ( ) Was not part of the decision process (If checked, go to 3C)

3A. Who was the main decision maker? If multiple people were responsible for the decision, please provide the name of the person you think is most knowledgeable about the decision making process to implement the energy efficient equipment.

3A. What is this person's telephone number?

3C. What is this person's email address?

4. What are the sources your organization relies on for information about energy efficient equipment, materials and design features? (check all that apply)
   ( ) A DCEO representative
   ( ) The DCEO website
   ( ) Smart Energy Design Assistance Center (SEDAC)
   ( ) The Energy Resource Center (ERC)
   ( ) A utility representative
   ( ) Brochures or advertisements
   ( ) Trade associations or business groups you belong to
   ( ) Trade journals or magazines
   ( ) Friends and colleagues
   ( ) An architect, engineer, or energy consultant
   ( ) Equipment vendors or building contractors
   ( ) Other (please specify)

5. Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? (check all that apply)
   ( ) An energy management plan (If checked, go to 5A)
   ( ) A staff member responsible for energy and energy efficiency
   ( ) Policies that incorporate energy efficiency in operations and procurement
   ( ) Active training of staff
   ( ) Do not have policies or procedures for energy efficiency improvements
   ( ) Other (please specify)

5A. Does your energy management plan include goals for energy savings?
   ( ) Yes (If checked, go to 5B)

( ) No
( ) Don't know

5B. Could you describe the goals specified in your energy management plan?

6. How does your organization decide to make energy efficiency improvements for this facility? Is the decision:
   ( ) Made by one or two key people
   ( ) Made by a group or committee
   ( ) Based on staff recommendations to a decision maker
   ( ) Made in some other way

7. How does your organization fund energy efficiency improvements? (select all that apply)
   ( ) Through a capital request (If checked, go to 7A)
   ( ) Funds are taken from operation and maintenance budget
   ( ) Dedicated funding for energy efficient projects
   ( ) Other (please specify)

7A. Is there a dollar threshold for when a project requires a capital request? If so, what is it?

7B. How long does it take to receive approval for the capital request?

8. In your organization, how long does it typically take to get approval for equipment purchases?

9. What is the approval process for equipment purchases in your organization? (select all that apply)
   ( ) An open bid is required
   ( ) Required to select lowest bidder
   ( ) Use a specific vendor
   ( ) Depends on the amount of purchase
   ( ) Follow state or federal procurement guidelines
   ( ) Follow procurement rules specific to our organization
   ( ) Don't know
   ( ) Other (please specify)

10. What barriers does your organization face in making energy efficiency improvements? (select all that apply)
   ( ) Insufficient funding for improvements
   ( ) Lack of information on energy efficient equipment and practices
   ( ) Approval processes that are slow or make purchasing difficult
   ( ) Schedules that dictate when equipment is to be replaced or maintained regardless of efficiency levels
   ( ) Incentive program time requirements
   ( ) Current equipment that is too new to be replaced with more efficient equipment
   ( ) Don't know
   ( ) Other (please specify)

11. Is your organization able to utilize incentive or grant payments you receive for energy efficiency improvements, or are the payments placed in the general revenue fund?
    ( ) We are able to use the incentive payments for additional facility improvements including additional energy efficiency improvements
    ( ) Incentive payments return to the facility general operating fund
    ( ) Incentive payments go into the state general revenue fund
    ( ) Don't know
    ( ) Other (please specify)

12. How important are incentive or grant payments from DCEO for your decision making regarding energy efficiency improvements.
    ( ) Very important
    ( ) Somewhat important
    ( ) Only slightly important
    ( ) Not important at all
    ( ) Don't know

13. How important is past experience with energy efficient equipment for your decision making regarding energy efficiency improvements?
    ( ) Very important
    ( ) Somewhat important
    ( ) Only slightly important
    ( ) Not important at all
    ( ) Don't know

14. How important is advice and/or recommendations received from DCEO for your decision making regarding energy efficiency improvements?
    ( ) Very important
    ( ) Somewhat important
    ( ) Only slightly important
    ( ) Not important at all
    ( ) Don't know

15. Which financial methods does your organization typically use to evaluate energy efficiency improvements for this facility? (Select all that apply)
    ( ) Initial Cost
    ( ) Simple payback (If checked, go to 15A)
    ( ) Internal rate of return (If checked, go to 15B)
    ( ) Life cycle cost (If checked, go to 15C)
    ( ) None of these

15A. What payback length of time do you normally require in order to proceed with an energy efficiency project? Please provide either a specific value, or an estimated range.

15B. What rate of return do you normally require in order to proceed with an energy efficiency project? Please provide either a specific value, or an estimated range.

15C. What discount rate do you normally apply when determining life cycle costs? Please provide either a specific value, or an estimated range.

16. Has your organization purchased any energy efficient equipment in the last three years for which you did not apply for a financial incentive through an energy efficiency program?
- ( ) Yes, purchased energy efficient equipment but did not apply for incentive. (If checked, go to 16A)
- ( ) No equipment was purchased by organization.
- ( ) No, an incentive was applied for. (If checked, go to 16BA)
- ( ) Don't know

16A. Why didn't you apply for a financial incentive for that equipment?
- ( ) Didn't know whether equipment qualified for financial incentives
- ( ) Financial incentive was insufficient
- ( ) Didn't have time to complete paperwork for financial incentive application
- ( ) Too much paperwork for the financial incentive application
- ( ) Didn't know about financial incentives until after equipment was purchased
- ( ) Other (please specify)

16B. Did you receive all of your incentives for these past energy efficiency projects?
- ( ) Yes
- ( ) No
- ( ) Don't know

17. How did you learn of the Public Sector Energy Efficiency Program? (select all that apply)
- ( ) Approached directly by a representative of the Public Sector Energy Efficiency Program
- ( ) Received an information brochure on the Public Sector Energy Efficiency Program
- ( ) A DCEO representative mentioned it
- ( ) The DCEO website
- ( ) Smart Energy Design Assistance Center (SEDAC)
- ( ) The Energy Resource Center (ERC)
- ( ) A utility representative
- ( ) Friends or colleagues
- ( ) An architect, engineer, or energy consultant
- ( ) Attended a conference, workshop or seminar
- ( ) An energy service company
- ( ) Past experience with the program
- ( ) Equipment vendors or building contractors
- ( ) Other (please specify)

18. When did you learn of the Public Sector Energy Efficiency Program?
    ( ) Before planning for replacing the equipment began
    ( ) Don't know
    ( ) During your planning to replace the equipment
    ( ) Once equipment had been specified but not yet installed
    ( ) After equipment was installed
    ( ) Some other time (please specify)

19. [If aggregation project] Did you receive any training or technical assistance provided by DCEO to assist in developing your aggregated project application?
    ( ) Yes (If checked, go to 19A)
    ( ) No

19A. Was this assistance helpful in developing your application?
    ( ) Yes
    ( ) No (If checked, go to 19B)
    ( ) Don't know

19B. What would have made the assistance more helpful?

20. Before participating in the Public Sector Energy Efficiency Program, had you installed any equipment or measure similar to the [Equipment Type] at this facility?
    ( ) Yes
    ( ) No

21. Did you have plans to install the [Equipment Type that you installed through the program at this facility before participating in the Public Sector Energy Efficient Program?
    ( ) Yes (If checked, go to 21A)
    ( ) No

21A. For about how long have you had plans to implement these measures prior to finding out about the program?
    ( ) Less than 6 months
    ( ) 6-12 months
    ( ) 1-2 years
    ( ) 3-5 years
    ( ) More than 5 years
    ( ) Don't know

21B. Did your plans specify which specific energy efficiency measures you were going to implement?
    ( ) Yes
    ( ) No, it was more of a general plan

21C. Would you have gone ahead with this planned installation even if you had not participated in the program?
    ( ) Yes

( ) No

22. Did you have experience with DCEO energy efficiency programs prior to participating in the Public Sector Energy Efficiency Program?
    ( ) Yes (If checked, go to 22A)
    ( ) No

22A. How important was previous experience with the DCEO programs in making your decision to install the [Equipment Type]?
    ( ) Very important
    ( ) Somewhat important
    ( ) Only slightly important
    ( ) Not at all important
    ( ) Don't know

23. Did a Public Sector Energy Efficiency Program or other DCEO representative recommend that you install the [Equipment Type]?
    ( ) Yes
    ( ) No
    ( ) Don't know

23A. If the Public Sector Energy Efficiency Program representative had not recommended installing the equipment, how likely is it that you would have installed it anyway?
    ( ) Definitely would have installed
    ( ) Probably would have installed
    ( ) Probably would not have installed
    ( ) Definitely would not have installed
    ( ) Don't know

24. Did a representative of the Smart Energy Design Assistance Center (SEDAC) recommend that you install the [Equipment Type]?
    ( ) Yes (If checked, go to 24A)
    ( ) No
    ( ) Don't know

24A. If the SEDAC representative had not recommended installing the equipment, how likely is it that you would have installed it anyway?
    ( ) Definitely would have installed
    ( ) Probably would have installed
    ( ) Probably would not have installed
    ( ) Definitely would not have installed
    ( ) Don't know

25. Would you have been financially able to install the [Equipment Type] without the financial incentive or grant from the Public Sector Energy Efficiency Program?
    ( ) Yes
    ( ) No

26. If the financial incentive or grant from the Public Sector Energy Efficiency Program had not been available, how likely is it that you would have installed the [Equipment Type] anyway?
    ( ) Definitely would have installed
    ( ) Probably would have installed
    ( ) Probably would not have installed
    ( ) Definitely would not have installed
    ( ) Don't know

27. How did the availability of information and financial incentives or grants through the Public Sector Energy Efficiency Program affect the quantity (or number of units) of [Equipment Type] that you purchased and installed? Did you purchase and install more [Equipment Type] than you otherwise would have without the program?
    ( ) Yes (If checked, go to 27A)
    ( ) No, program did not affect quantity purchased and installed

27A. How much/many more [Equipment Type] did you install?

28. How did the availability of information and financial incentives or grants through the Public Sector Energy Efficiency Program affect the level of energy efficiency you chose for the [Equipment Type]? Did you choose equipment that was more energy efficient than you otherwise would have chosen because of the program?
    ( ) Yes (If checked, go to 28A)
    ( ) No, program did not affect level of efficiency chosen for equipment

28A. How much more efficient [Equipment Type] did you install? (i.e., "xx% more efficient")

29. How did the availability of information and financial incentives or grants through the Public Sector Energy Efficiency Program affect the timing of your purchase and installation of the [Equipment Type]? Did you purchase and install the [Equipment Type] earlier than you otherwise would have without the program?
    ( ) Yes (If checked, go to 29A)
    ( ) No, the program did not affect the timing of the purchase and installation

29A. When would you otherwise have installed the equipment?
    ( ) Less than 6 months later
    ( ) 6-12 months later
    ( ) 1-2 years later
    ( ) 3-5 years later
    ( ) More than 5 years later

30. Did the project implementation go smoothly?
    ( ) Yes
    ( ) For the most part (If checked, go to 30A)
    ( ) No (If checked, go to 30A)
    ( ) Don't know

30A. Please explain in what ways project implementation did not go smoothly.

31. Did the energy efficiency measure(s) meet your expectations?
( ) My expectations were exceeded
( ) My expectations were met
( ) My expectations were mostly met (If checked, go to 31A)
( ) My expectations were not met(If checked, go to 31A)
( ) Don't know

31A. Please explain in what ways the energy efficiency measure did not meet you expectations.

32. Do you feel you got a quality installation?
( ) Yes
( ) For the most part (If checked, go to 32A)
( ) No (If checked, go to 32A)
( ) Don't know

32A. Please explain in what ways you did not receive a quality installation.\

33. Did the incentive agreement that you received meet your expectations?
( ) Yes
( ) No (If checked, go to 33A)
( ) Don't know

33A. Please explain in what ways the incentive you received did not meet your expectations.

34. Did anyone from Public Sector Energy Efficiency Program or any other DCEO representative come to this facility to do a pre-inspection?
( ) Yes (If checked, go to 34A)
( ) No
( ) Don't know

34A. Who performed the inspection?

34B. What did the inspection consist of?

34C. Did anything change in the project design as a result of the pre-inspection?
( ) Yes (If checked, go to 34D)
( ) No
( ) Don't know

34D. Please explain the way in which the program design changed as a result of the pre-inspection.

35. Did anyone from Public Sector Energy Efficiency Program or any other DCEO representative come to this facility to do a post-inspection?

( ) Yes (If checked, go to 35A)
( ) No
( ) Don't know

35A. Who performed the inspection?

35B. What did the post-inspection consist of?

35C. Did anything change in the incentive amount as a result of the post-inspection?
( ) Yes (If checked, go to 35D)
( ) No
( ) Don't know

35D. Please explain how the incentive amount changed as a result of the post-inspection.

36. Were there any issues with receiving the incentive check?
( ) Yes (If checked, go to 36A)
( ) No
( ) Don't know

36A. Please describe the issues you had with receiving the incentive check.

37. Was the incentive amount what you expected?
( ) Yes
( ) No (If checked, go to 37A)
( ) Don't know

37A. Please explain how the incentive amount differed from what you expected.

38. Since participating in the Public Sector Energy Efficiency Program, have you implemented any additional energy measures similar to those you implemented through the program that you did not apply or receive an incentive for?
( ) Yes (If checked, go to 38A)
( ) No
( ) Don't know

38A. Did the additional energy efficiency measures result in the same or higher level of efficiency improvement as the measures implemented through the program?
( ) Yes
( ) No
( ) Don't know

38B. Were these additional measures installed at the same facility (or facilities) as the energy efficiency measures that you received an incentive for?
( ) Yes
( ) Don't know
( ) No; Where was the equipment installed? (please specify)

38C. Did a recommendation from a program staff member or contractor influence your decision to implement the additional measures?

( ) Yes (If checked, go to 38C1)
( ) No
( ) Don't know

38C1. How important was this recommendation to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neither important or unimportant
( ) Somewhat unimportant
( ) Unimportant
( ) Don't know

38D. How important was your experience with the program or the [Equipment Type] implemented through the program to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neither important or unimportant
( ) Somewhat unimportant
( ) Unimportant
( ) Don't know

38E. How important was your participation in any past programs offered by DCEO to your decision to implement the additional energy efficiency measures.

( ) Very important
( ) Somewhat important
( ) Neither important or unimportant
( ) Somewhat unimportant
( ) Unimportant
( ) Don't know

38F. Why didn't you apply for or receive any financial assistance or incentives for those items?

( ) Didn't know whether equipment qualified for financial incentives
( ) Too much paperwork for the financial incentive application
( ) Financial incentive was insufficient
( ) Didn't have time to complete paperwork for financial incentive application
( ) Didn't know about financial incentives until after equipment was purchased
( ) For some other reason (please specify)

39. Since participating in the Public Sector Energy Efficiency Program, have you implemented any other energy efficient equipment that was not similar to what you implemented through the program that you did not apply or receive an incentive for?

( ) Yes (If checked, go to 39A)
( ) No

( ) Don't know

39A. What energy efficient equipment did you purchase?

39B. Was this equipment installed at the same facility (or facilities) as the equipment for which you received a rebate?

( ) Yes
( ) Don't know
( ) No; Where was the equipment installed? (please specify)

39C. Did a recommendation from a program staff member or contractor influence your decision to implement the additional measures?

( ) Yes (If checked, go to 39C1)
( ) No
( ) Don't know

39C1. How important was this recommendation in to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neither important or unimportant
( ) Somewhat unimportant
( ) Unimportant
( ) Don't know

39D. How important was your experience with the program or the [Equipment Type] implemented through the program to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neither important or unimportant
( ) Somewhat unimportant
( ) Unimportant
( ) Don't know

39E. How important was your participation in any past programs offered by DCEO to your decision to implement the additional energy efficiency measures.

( ) Very important
( ) Somewhat important
( ) Neither important or unimportant
( ) Somewhat unimportant
( ) Unimportant
( ) Don't know

39F. Why didn't you apply for receive any financial assistance or incentives for those items?

( ) Didn't know whether equipment qualified for financial incentives
( ) Too much paperwork for the financial incentive application

( ) Financial incentive was insufficient
( ) Didn't have time to complete paperwork for financial incentive application
( ) Didn't know about financial incentives until after equipment was purchased
( ) For some other reason (please specify)

40. Given your experience with the Public Sector Energy Efficiency Program, would you buy energy efficient equipment in the future even if financial incentives or grants for such equipment were not being offered through the Public Sector Energy Efficiency Program?
    ( ) Yes
    ( ) No
    ( ) Don't know

41. How would you rate your satisfaction with the following - Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied?
    ( ) Information provided by DCEO Account Representative
    ( ) The effort required for the application process
    ( ) Performance of the equipment installed
    ( ) Quality of the work conducted by your contractor
    ( ) Information provided by Smart Energy Design Assistance Center (SEDAC)
    ( ) Savings on your monthly bill
    ( ) The elapsed time until you received the incentive
    ( ) Incentive amount
    ( ) Information provided by the Energy Resource Center (ERC)
    ( ) Overall program experience

41A. (If dissatisfied or very dissatisfied checked for any) Please describe in what ways you were not satisfied with the program.

Do you have any other comments that you would like to relay to DECO about energy efficiency in public entities, or about their programs?

THANK YOU!

Thank you for taking our survey. Your response is very important to us.

# Appendix B: Decision Maker Survey Responses

As part of the evaluation work effort, a survey was made of a sample of decision makers for facilities that received incentives from the Custom and Standard Incentives Programs. The survey provided the information used in Chapter 3 to estimate free ridership for projects in the Custom and Standard Incentives Programs. However, the survey also provided more general information pertaining to the making of decisions to improve energy efficiency by program participants.

Each participant was interviewed using the survey instrument provided in Appendix B. The interviews were conducted by telephone or internet. During the interview, a participant was asked questions about (1) his or her general decision making regarding purchasing and installing energy efficient equipment, (2) his or her knowledge of and satisfaction with the program, and (3) the influence that the program had on his or her decision to install energy efficiency measures (e.g., lighting measures, HVAC measures,).

The following tabulations summarize participant survey responses. Two columns of data are presented. The first column presents the number of survey respondents (*n)*. The second column presents the percentage of survey respondents (*n)*.

| 1. What was your role in the decision making process to implement the energy efficiency project? | *Response* | *(n=193)* | *Percent of Respondents* |
|---|---|---|---|
| | Main decision maker | 100 | 52% |
| | Assisted with the decision | 89 | 46% |
| | Was not part of the decision process | 4 | 2% |

| 3. What are the sources your organization relies on for information about energy efficient equipment, materials and design features? | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| | A DCEO representative | 58 | 30% |
| | The DCEO website | 69 | 36% |
| | Smart Energy Design Assistance Center (SEDAC) | 55 | 28% |
| | The Energy Resource Center (ERC) | 16 | 8% |
| | A utility representative | 39 | 20% |
| | Brochures or advertisements | 36 | 19% |
| | Trade associations or business groups you belong to | 43 | 22% |
| | Trade journals or magazines | 39 | 20% |
| | Friends and colleagues | 63 | 33% |
| | An architect, engineer, or energy consultant | 116 | 60% |
| | Equipment vendors or building contractors | 96 | 50% |
| | Other (please describe) | 22 | 11% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| 4. Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| | An energy management plan | 24 | 12% |
| | A staff member responsible for energy and energy efficiency | 76 | 39% |
| | Policies that incorporate energy efficiency in operations and procurement | 63 | 33% |
| | Active training of staff | 44 | 23% |
| | Do not have policies or procedures for energy efficiency improvements | 60 | 31% |
| | Other | 20 | 10% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| 4a. Does your energy management plan include goals for energy savings? | *Response* | *(n=24)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 21 | 88% |
| | No | 1 | 4% |
| | Don't Know | 2 | 8% |

| | *Response* | *(n=192)* | *Percent of Respondents* |
|---|---|---|---|
| 5. How does your organization decide to make energy efficiency improvements for this facility? Is the decision: | Made by one or two key people | 69 | 36% |
| | Based on staff recommendations to a decision maker | 52 | 27% |
| | Made by a group or committee | 67 | 35% |
| | Other | 4 | 2% |

| | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| 6. How does your organization fund energy efficiency improvements? | Through a capital request | 69 | 36% |
| | Funds are taken from operation and maintenance budget | 151 | 78% |
| | Dedicated funding for energy efficient projects | 25 | 13% |
| | Other (please specify) | 35 | 18% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| | *Response* | *(n=53)* | *Percent of Respondents* |
|---|---|---|---|
| 6a. Is there a dollar threshold for when a project requires a capital request? If so, what is it? | Yes | 53 | 27% |
| | No | 16 | 73% |
| | Average Theshold if "Yes" (in Dollars) | | 21333.33333 |

| | *Average Number of Days, (n=50)* | |
|---|---|---|
| 6b. How long does it take to receive approval for the capital request? | Average | 216.2 |

| | *Average Number of Days, (n=177)* | |
|---|---|---|
| 7. In your organization, how long does it typically take to get approval for equipment purchases? | Average | 77.59367089 |

| | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| 8. What is the approval process for equipment purchases in your organization? | An open bid is required | 96 | 50% |
| | Required to select lowest bidder | 63 | 33% |
| | Use a specific vendor | 13 | 7% |
| | Depends on the amount of purchase | 164 | 85% |
| | Follow state or federal procurement guidelines | 105 | 54% |
| | Follow procurement rules specific to our organization | 99 | 51% |
| | Don't know | 0 | 0% |
| | Other | 8 | 4% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| 9. What barriers does your organization face in making energy efficiency improvements? | Insufficient funding for improvements | 152 | 79% |
| | Lack of information on energy efficient equipment and practices | 41 | 21% |
| | Approval processes that are slow or make purchasing difficult | 23 | 12% |
| | Schedules dictate when equipment is to be changed regardless of efficiency levels | 24 | 12% |
| | Incentive program time requirements | 33 | 17% |
| | Current equipment that is too new to be replaced with more efficient equipment | 38 | 20% |
| | Don't know | 6 | 3% |
| | Other | 12 | 6% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| | *Response* | *(n=193)* | *Percent of Respondents* |
|---|---|---|---|
| 10. Is your organization able to utilize incentive or grant payments you receive for energy efficiency improvements, or are the payments placed in the general revenue fund? | Use the incentives for additional improvements including energy efficiency improvements | 106 | 55% |
| | Incentive payments return to the facility general operating fund | 62 | 32% |
| | Incentive payments go into the state general revenue fund | 2 | 1% |
| | Don't know | 12 | 6% |
| | Other | 11 | 6% |

| | *Response* | *(n=192)* | *Percent of Respondents* |
|---|---|---|---|
| 11. How important are incentive or grant payments from DCEO for your decision making regarding energy efficiency improvements? | Very important | 165 | 86% |
| | Somewhat important | 23 | 12% |
| | Only slightly important | 4 | 2% |
| | Not important at all | 0 | 0% |
| | Don't know | 0 | 0% |

| | *Response* | *(n=193)* | *Percent of Respondents* |
|---|---|---|---|
| 12. How important is past experience with energy efficient equipment for your decision making regarding energy efficiency improvements? | Very important | 136 | 70% |
| | Somewhat important | 54 | 28% |
| | Only slightly important | 2 | 1% |
| | Not important at all | 0 | 0% |
| | Don't know | 1 | 1% |

| 13. How important is advice and/or recommendations received from DCEO for your decision making regarding energy efficiency improvements? | *Response* | *(n=193)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 119 | 62% |
| | Somewhat important | 55 | 28% |
| | Only slightly important | 13 | 7% |
| | Not important at all | 2 | 1% |
| | Don't know | 4 | 2% |

| 14. Which financial methods does your organization typically use to evaluate energy efficiency improvements for your facility? | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| | Initial cost | 141 | 73% |
| | Simple payback | 127 | 66% |
| | Internal rate of return | 42 | 22% |
| | Life cycle cost | 78 | 40% |
| | None of these | 6 | 3% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| 14a. What payback (length of time) do you normally require in order to consider an energy investment cost effective? | Average (Years) (n=99) | |
|---|---|---|
| | Average | 5.2 |

| 15. Has your organization purchased any energy efficient equipment in the last three years for which you did not apply for a financial incentive through an energy efficiency program? | *Response* | *(n=189)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes, purchased energy efficient equipment but did not apply for incentive | 73 | 39% |
| | No equipment was purchased by organization | 34 | 18% |
| | No, an incentive was applied for | 64 | 34% |
| | Don't know | 18 | 10% |

| 15a. Why didn't you apply for a financial incentive for that equipment? | *Response* | *(n=71)* | *Percent of Respondents* |
|---|---|---|---|
| | Didn't know whether equipment qualified for financial incentives | 16 | 23% |
| | Financial incentive was insufficient | 6 | 8% |
| | Didn't have time to complete paperwork for financial incentive application | 9 | 13% |
| | Too much paperwork for the financial incentive application | 3 | 4% |
| | Didn't know about financial incentives until after equipment was purchased | 22 | 31% |
| | Other | 15 | 21% |

| 15b. Did you receive all of your incentives for these past energy efficiency projects? | *Response* | *(n=64)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 57 | 89% |
| | No | 5 | 8% |
| | Don't know | 2 | 3% |

| 16. How did you learn of the Public Sector Energy Efficiency Program? | *Response* | *(n=193)* | *Percent of Respondents** |
|---|---|---|---|
| | Approached by a representative of the Public Sector Energy Efficiency Program | 28 | 15% |
| | Received an information brochure on the Public Sector Energy Efficiency Program | 37 | 19% |
| | A DCEO representative mentioned it | 23 | 12% |
| | The DCEO website | 53 | 27% |
| | Smart Energy Design Assistance Center (SEDAC) | 43 | 22% |
| | The Energy Resource Center (ERC) | 7 | 4% |
| | A utility representative | 32 | 17% |
| | Friends or colleagues | 45 | 23% |
| | An architect, engineer, or energy consultant | 63 | 33% |
| | Attended a conference, workshop or seminar | 52 | 27% |
| | An energy service company | 15 | 8% |
| | Past experience with the program | 42 | 22% |
| | Equipment vendors or building contractors | 62 | 32% |
| | Other | 23 | 12% |

**Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.*

| 17. When did you learn of the Public Sector Energy Efficiency Program? | *Response* | *(n=190)* | *Percent of Respondents* |
|---|---|---|---|
| | Before planning for replacing the equipment began | 108 | 57% |
| | During your planning to replace the equipment | 49 | 26% |
| | Once equipment had been specified but not yet installed | 4 | 2% |
| | After equipment was installed | 4 | 2% |
| | Some other time | 0 | 0% |
| | Don't know | 23 | 12% |

| 18. Did you receive any training or technical assistance provided by DCEO to assist in developing your aggregated project application? | *Response* | *(n=9)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 6 | 67% |
| | No | 3 | 33% |

| 19. Was this assistance helpful in developing your application? | *Response* | *(n=6)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 6 | 100% |
| | No | 0 | 0% |
| | Don't Know | 0 | 0% |

| 20. Before participating in the Public Sector Efficiency Program, had you installed any equipment/measure similar to [Rebated Equipment/Measure] at your facility? | *Response* | *(n=210)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 89 | 42% |
| | No | 121 | 58% |
| | Don't Know | 0 | 0% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 21. Did you have plans to install [Equipment/Measure] before participating in the program? | *Response* | *(n=211)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 101 | 48% |
| | No | 110 | 52% |
| | Don't Know | 0 | 0% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 21a. For about how long have you had plans to implement these measures prior to finding out about the program? | *Response* | *(n=101)** | *Percent of Respondents* |
|---|---|---|---|
| | Less than 6 months | 17 | 17% |
| | 6-12 months | 30 | 30% |
| | 1-2 years | 34 | 34% |
| | 3-5 years | 14 | 14% |
| | More than 5 years | 3 | 3% |
| | Don't know | 3 | 3% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 21b. Did your plans specify which specific energy efficiency measures you were going to implement? | *Response* | *(n=101)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 47 | 47% |
| | No | 54 | 53% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 21c. Would you have gone ahead with this planned installation even if you had not participated in the program? | *Response* | *(n=101)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 60 | 59% |
| | No | 41 | 41% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 22. Did you have experience with DCEO energy efficiency programs prior to participating in the Public Sector Energy Efficiency Program? | *Response* | *(n=213)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 79 | 37% |
| | No | 134 | 63% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 22a. How important was previous experience with the DCEO programs in making your decision to install [Equipment/Measure]? | *Response* | *(n=79)** | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 58 | 73% |
| | Somewhat important | 14 | 18% |
| | Only slightly important | 2 | 3% |
| | Not at all important | 4 | 5% |
| | Don't know | 1 | 1% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 23. Did a Public Sector Energy Efficiency Program or other DCEO representative recommend that you install the [Equipment/Measure]? | *Response* | *(n=211)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 58 | 27% |
| | No | 122 | 58% |
| | Don't know | 31 | 15% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 23a. If the Public Sector Energy Efficiency Program representative had not recommended installing the equipment, how likely is it that you would have installed it anyway? | *Response* | *(n=58)** | *Percent of Respondents* |
|---|---|---|---|
| | Definitely would have installed | 13 | 22% |
| | Probably would have installed | 17 | 29% |
| | Probably would not have installed | 21 | 36% |
| | Definitely would not have installed | 1 | 2% |
| | Don't know | 6 | 10% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 24. Did a representative of the Smart Energy Design Assistance Center (SEDAC) recommend that you install the [Equipment/Measure]? | *Response* | *(n=210)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 48 | 23% |
| | No | 123 | 59% |
| | Don't know | 39 | 19% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 24a. If the SEDAC representative had not recommended installing the equipment, how likely is it that you would have installed it anyway? | *Response* | *(n=48)** | *Percent of Respondents* |
|---|---|---|---|
| | Definitely would have installed | 10 | 21% |
| | Probably would have installed | 21 | 44% |
| | Probably would not have installed | 11 | 23% |
| | Definitely would not have installed | 2 | 4% |
| | Don't know | 4 | 8% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 25. Would you have been financially able to install [Equipment/Measure] without the financial incentive or grant from the Public Sector Energy Efficiency Program? | *Response* | *(n=211)** | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 81 | 38% |
| | No | 130 | 62% |
| | Don't know | 0 | 0% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 26. If the financial incentive or grant from the Public Sector Efficiency Program had not been available, how likely is it that you would have installed [Equipment/ Measure] anyway? | *Response* | *(n=212)** | *Percent of Respondents* |
|---|---|---|---|
| | Definitely would have installed | 29 | 14% |
| | Probably would have installed | 56 | 26% |
| | Probably would not have installed | 93 | 44% |
| | Definitely would not have installed | 27 | 13% |
| | Don't know | 7 | 3% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 27. How did the availability of information and financial incentives or grants through the Public Sector Energy Efficiency Program affect the quantity (number of units) of [Equipment/ Measure] that you purchased and installed? | *Response* | *(n=210)** | *Percent of Respondents* |
|---|---|---|---|
| | Purchased and installed more equipment or measures than otherwise would have | 94 | 45% |
| | Did not affect quantity purchased and installed | 116 | 55% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 28. How did the availability of information and financial incentives or grants through the Public Sector Energy Efficiency Program affect the level of energy efficiency you chose for [Equipment/Measure]? | *Response* | *(n=182)** | *Percent of Respondents* |
|---|---|---|---|
| | Efficiency of equipment was better than otherwise would have chosen | 62 | 34% |
| | Did not affect level of efficiency that we chose for equipment | 120 | 66% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 29. How did the availability of information and financial incentives or grants through the Public Sector Energy Efficiency Program affect the timing of your purchase and installation of [Equipment/Measure]? | *Response* | *(n=208)** | *Percent of Respondents* |
|---|---|---|---|
| | Purchased and installed more equipment or measures than otherwise would have | 131 | 63% |
| | Did not affect timing of purchase and installation | 77 | 37% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 29a. When would you otherwise have installed the equipment? | *Response* | *(n=130)** | *Percent of Respondents* |
|---|---|---|---|
| | In less than 6 months | 5 | 4% |
| | In 6-12 months | 12 | 9% |
| | In 1-2 years | 38 | 29% |
| | In 3-5 years | 51 | 39% |
| | In more than 5 years | 24 | 18% |

**Each decision maker may have answered more than one time. Questions may have been repeated for each measure type implemented.*

| 30. Did the implementation go smoothly? | *Response* | *(n=187)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 163 | 87% |
| | For the most part | 21 | 11% |
| | No | 2 | 1% |
| | Don't know | 1 | 1% |

| 31. Did the energy efficiency measure(s) meet your expectations? | *Response* | *(n=189)* | *Percent of Respondents* |
|---|---|---|---|
| | My expectations were exceeded | 65 | 34% |
| | My expectations were met | 108 | 57% |
| | My expectations were mostly met | 2 | 1% |
| | My expectations were not met | 2 | 1% |
| | Don't know | 12 | 6% |

| 32. Do you feel you got a quality installation? | *Response* | *(n=187)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 179 | 96% |
| | For the most part | 5 | 3% |
| | No | 1 | 1% |
| | Don't know | 2 | 1% |

| 33. Did the incentive agreement that you received meet your expectations? | *Response* | *(n=188)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 180 | 96% |
| | No | 3 | 2% |
| | Don't know | 5 | 3% |

| 34. Did anyone from Public Sector Energy Efficiency Program or any other DCEO representative come to this facility to do a pre-inspection? | *Response* | *(n=188)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 25 | 13% |
| | No | 94 | 50% |
| | Don't know | 69 | 37% |

| 35. Did anything change in the project design as a result of the pre-inspection? | *Response* | *(n=24)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 4 | 17% |
| | No | 19 | 79% |
| | Don't know | 1 | 4% |

| 36. Did anyone from Public Sector Energy Efficiency Program or any other DCEO representative come to this facility to do a post-inspection? | *Response* | *(n=185)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 46 | 25% |
| | No | 75 | 41% |
| | Don't know | 64 | 35% |

| 37. Did anything change in the incentive amount as a result of the post-inspection? | *Response* | *(n=46)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 3 | 7% |
| | No | 43 | 93% |
| | Don't know | 0 | 0% |

| 38. Were there any issues receiving the incentive check? | *Response* | *(n=186)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 5 | 3% |
| | No | 166 | 89% |
| | Don't know | 15 | 8% |

| 39. Was the incentive check the amount you expected? | *Response* | *(n=187)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 171 | 91% |
| | No | 1 | 1% |
| | Don't know | 15 | 8% |

| 40. Since participating in the Public Sector Energy Efficiency Program, have you implemented any additional energy measures similar to those you implemented through the program that you did not apply or receive an incentive for? | *Response* | *(n=185)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 39 | 21% |
| | No | 127 | 69% |
| | Don't know | 19 | 10% |

| 40a. Did the additional energy efficiency measures result in the same or higher level of efficiency improvement as the measures implemented through the program? | *Response* | *(n=39)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 28 | 72% |
| | No | 7 | 18% |
| | Don't know | 4 | 10% |

| 40b. Were these additional measures installed at the same facility (or facilities) as the energy efficiency measures that you received an incentive for? | *Response* | *(n=39)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 19 | 49% |
| | No | 14 | 36% |
| | Don't know | 6 | 15% |

| 40c. Did a recommendation from a program staff member or contractor influence your decision to implement the additional measures? | *Response* | *(n=38)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 11 | 29% |
| | No | 25 | 66% |
| | Don't know | 2 | 5% |

| 40d. How important was this recommendation to your decision to implement the additional energy efficiency measures? | *Response* | *(n=11)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 9 | 82% |
| | Somewhat important | 2 | 18% |
| | Neither important or unimportant | 0 | 0% |
| | Somewhat unimportant | 0 | 0% |
| | Unimportant | 0 | 0% |
| | Don't know | 0 | 0% |

| 40e. How important was your experience with the program or the measures implemented through the program to your decision to implement the additional energy efficiency measures? | *Response* | *(n=39)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 18 | 46% |
| | Somewhat important | 15 | 38% |
| | Neither important or unimportant | 2 | 5% |
| | Somewhat unimportant | 0 | 0% |
| | Unimportant | 4 | 10% |
| | Don't know | 0 | 0% |

| 40f. How important was your participation in any past programs offered by DCEO to your decision to implement the additional energy efficiency measures? | *Response* | *(n=38)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 19 | 50% |
| | Somewhat important | 9 | 24% |
| | Neither important or unimportant | 6 | 16% |
| | Somewhat unimportant | 0 | 0% |
| | Unimportant | 3 | 8% |
| | Don't know | 1 | 3% |

| 40g. Why didn't you apply for or receive any financial assistance or incentives for those items? | *Response* | *(n=39)* | *Percent of Respondents* |
|---|---|---|---|
| | Didn't know whether equipment qualified for financial incentives | 10 | 26% |
| | Financial incentive was insufficient | 1 | 3% |
| | Didn't have time to complete paperwork for financial incentive application | 2 | 5% |
| | Too much paperwork for the financial incentive application | 4 | 10% |
| | Didn't know about financial incentives until after equipment was purchased | 7 | 18% |
| | Other | 15 | 38% |

| 41. Since participating in the Public Sector Energy Efficiency Program, have you implemented any additional energy efficiency equipment that was not similar to those you implemented through the program that you did not apply or receive an incentive for? | *Response* | *(n=186)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 21 | 11% |
| | No | 146 | 78% |
| | Don't know | 19 | 10% |

| 41b. Was this equipment installed at the same facility (or facilities) as the equipment for which you received a rebate? | *Response* | *(n=21)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 13 | 62% |
| | No | 7 | 33% |
| | Don't know | 1 | 5% |

| 41c. Did a recommendation from a program staff member or contractor influence your decision to implement the additional measures? | *Response* | *(n=21)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 9 | 43% |
| | No | 12 | 57% |
| | Don't know | 0 | 0% |

| 41d. How important was this recommendation to your decision to implement the additional energy efficiency measures? | *Response* | *(n=20)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 6 | 30% |
| | Somewhat important | 4 | 20% |
| | Neither important or unimportant | 7 | 35% |
| | Somewhat unimportant | 0 | 0% |
| | Unimportant | 2 | 10% |
| | Don't know | 1 | 5% |

| 41e. How important was your experience with the program or the measures implemented through the program to your decision to implement the additional energy efficiency measures? | *Response* | *(n=20)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 8 | 40% |
| | Somewhat important | 5 | 25% |
| | Neither important or unimportant | 5 | 25% |
| | Somewhat unimportant | 0 | 0% |
| | Unimportant | 1 | 5% |
| | Don't know | 1 | 5% |

| 41f. How important was your participation in any past programs offered by DCEO to your decision to implement the additional energy efficiency measures? | *Response* | *(n=21)* | *Percent of Respondents* |
|---|---|---|---|
| | Very important | 10 | 48% |
| | Somewhat important | 6 | 29% |
| | Neither important or unimportant | 3 | 14% |
| | Somewhat unimportant | 0 | 0% |
| | Unimportant | 1 | 5% |
| | Don't know | 1 | 5% |

| 41g. Why didn't you apply for or receive any financial assistance or incentives for those items? | *Response* | *(n=39)* | *Percent of Respondents* |
|---|---|---|---|
| | Didn't know whether equipment qualified for financial incentives | 10 | 26% |
| | Financial incentive was insufficient | 1 | 3% |
| | Didn't have time to complete paperwork for financial incentive application | 2 | 5% |
| | Too much paperwork for the financial incentive application | 4 | 10% |
| | Didn't know about financial incentives until after equipment was purchased | 7 | 18% |
| | Other | 15 | 38% |

| 42. Given your experience with the Public Sector Energy Efficiency Program, would you buy energy efficient equipment in the future even if financial incentives or grants for such equipment were not being offered through the Public Sector Energy Efficiency Program? | *Response* | *(n=184)* | *Percent of Respondents* |
|---|---|---|---|
| | Yes | 124 | 67% |
| | No | 18 | 10% |
| | Don't know | 42 | 23% |

| 43a. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the information provided by DCEO Account Representative? | *Response* | *(n=186)* | *Percent of Respondents** |
|---|---|---|---|
| | 5 | 85 | 46% |
| | 4 | 72 | 39% |
| | 3 | 14 | 8% |
| | 2 | 1 | 1% |
| | 1 | 0 | 0% |
| | Not Applicable | 14 | 8% |
| | Average | | 4.4 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| 43b. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the effort required for the application process? | *Response* | *(n=186)* | *Percent of Respondents** |
|---|---|---|---|
| | 5 | 69 | 37% |
| | 4 | 92 | 49% |
| | 3 | 16 | 9% |
| | 2 | 3 | 2% |
| | 1 | 0 | 0% |
| | Not Applicable | 6 | 3% |
| | Average | | 4.3 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| 43c. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the performance of the equipment installed? | *Response* | *(n=184)* | *Percent of Respondents** |
|---|---|---|---|
| | 5 | 117 | 64% |
| | 4 | 62 | 34% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 5 | 3% |
| | Average | | 4.7 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=186)* | *Percent of Respondents** |
|---|---|---|---|
| 43d. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the quality of the work conducted by your contractor? | 5 | 112 | 60% |
| | 4 | 57 | 31% |
| | 3 | 2 | 1% |
| | 2 | 1 | 1% |
| | 1 | 0 | 0% |
| | Not Applicable | 14 | 8% |
| | Average | | 4.6 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=186)* | *Percent of Respondents** |
|---|---|---|---|
| 43e. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the information provided by Smart Energy Design Assistance Center (SEDAC)? | 5 | 59 | 32% |
| | 4 | 60 | 32% |
| | 3 | 26 | 14% |
| | 2 | 3 | 2% |
| | 1 | 0 | 0% |
| | Not Applicable | 38 | 20% |
| | Average | | 4.2 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=184)* | *Percent of Respondents** |
|---|---|---|---|
| 43f. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the savings on your monthly bill? | 5 | 75 | 41% |
| | 4 | 82 | 45% |
| | 3 | 15 | 8% |
| | 2 | 2 | 1% |
| | 1 | 0 | 0% |
| | Not Applicable | 10 | 5% |
| | Average | | 4.3 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=185)* | *Percent of Respondents** |
|---|---|---|---|
| 43g. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the elapsed time until you received the incentive? | 5 | 70 | 38% |
| | 4 | 90 | 49% |
| | 3 | 15 | 8% |
| | 2 | 2 | 1% |
| | 1 | 1 | 1% |
| | Not Applicable | 7 | 4% |
| | Average | | 4.3 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=184)* | *Percent of Respondents** |
|---|---|---|---|
| 43h. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the incentive amount? | 5 | 76 | 41% |
| | 4 | 85 | 46% |
| | 3 | 14 | 8% |
| | 2 | 2 | 1% |
| | 1 | 1 | 1% |
| | Not Applicable | 6 | 3% |
| | Average | | 4.3 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=185)* | *Percent of Respondents** |
|---|---|---|---|
| 43i. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the information provided by the Energy Resource Center (ERC)? | 5 | 41 | 22% |
| | 4 | 68 | 37% |
| | 3 | 29 | 16% |
| | 2 | 1 | 1% |
| | 1 | 0 | 0% |
| | Not Applicable | 46 | 25% |
| | Average | | 4.1 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

| | *Response* | *(n=181)* | *Percent of Respondents** |
|---|---|---|---|
| 43j. On a scale of 1 to 5, where "5" is very satisfied and "1" is very unsatisfied, how satisfied are you with the overall program experience? | 5 | 93 | 51% |
| | 4 | 79 | 44% |
| | 3 | 6 | 3% |
| | 2 | 0 | 0% |
| | 1 | 1 | 1% |
| | Not Applicable | 2 | 1% |
| | Average | | 4.5 |

**Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)*

# Appendix C: Questionnaire for New Construction Survey

1. Name of public entity

2. Your name (please correct if necessary)

3. What was your role in making the decision to implement the energy efficiency measures in the new construction project completed through the program?
   ( ) Main decision maker
   ( ) Assisted with the decision to implement the measure
   ( ) Was not part of the decision process (If checked, go to 3A)

   3A. Who was the main decision maker? If multiple people were responsible for the decision, please provide the name of the person you think is most knowledgeable about the decision making process for implementing the energy efficiency measures in the new construction process.

   3B. What is this person's telephone number?

   3C. What is this person's email address?

4. What are the sources your organization relies on for information about energy efficient equipment, materials and design features? (Check all that apply)
   ( ) A DCEO Representative
   ( ) The DCEO Website
   ( ) Utility representatives
   ( ) Brochures or advertisements
   ( ) Trade associations or business groups you belong to
   ( ) Trade journals or magazines
   ( ) Friends and colleagues
   ( ) Representatives of the Smart Energy Design Assistance Center (SEDAC)
   ( ) Representative of the Energy Resource Center (ERC)
   ( ) Architects, engineers or energy consultants
   ( ) Equipment vendors or building contractors
   ( ) Other (please describe)

5. Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? (Check all that apply)
   ( ) An energy management plan (If checked, go to 5A)
   ( ) A designated staff member responsible for energy tracking and energy efficiency
   ( ) Policies that incorporate energy efficiency in operations and procurement
   ( ) Active training of staff
   ( ) None
   ( ) Other (please specify)

5A. Does your energy management plan include goals for energy savings?
( ) Yes (If checked, go to 5B)
( ) No
( ) Don't know

5B. Could you describe the goals specified in your energy management plan?

6. In your organization, how long does it typically take to get approval for new construction projects?
7. What barriers does your organization face in developing energy efficient new construction projects? (Select all that apply)
( ) Insufficient funding for energy efficiency
( ) Lack of information on energy efficient equipment and design features
( ) Approval processes that slow or make incorporating energy efficiency difficult
( ) Incentive program time requirements
( ) Don't know
( ) Other (please specify)

8. Is your organization able to utilize incentive or grant payments you receive for energy efficiency improvements or are the payments placed in a general fund?
( ) We are able to use the incentive payments for additional facility improvements, including additional energy efficiency improvements
( ) Incentive payments return to the facility general operating fund
( ) Incentive payments go into the state general revenue fund
( ) Don't know
( ) Other (please specify)

9. How important are incentive payments from the DCEO for your decision making regarding implementing energy efficient equipment or design features?
( ) Very important
( ) Somewhat important
( ) Only slightly important
( ) Not important at all
( ) Don't know

10. How important is advice and/or recommendations received from DCEO for your decision making regarding implementing energy efficient equipment or design features?
( ) Very important
( ) Somewhat important
( ) Only slightly important
( ) Not important at all
( ) Don't know

11. Which financial methods does your organization typically use to evaluate energy efficiency investments? (Select all that apply)
( ) Initial Cost
( ) Simple payback (If checked, go to 11A)

( ) Internal rate of return (If checked, go to 11B)
( ) Life cycle cost (If checked, go to 11C)
( ) None of these

11A. What payback length of time do you normally require in order to proceed with an energy efficiency project? Please provide either a specific value or an estimated range.

11B. What rate of return do you normally require in order to proceed with an energy efficiency project? Please provide either a specific value or an estimated range.

11C. What discount rate do you normally apply when determining life cycle costs? Please provide either a specific value or an estimated range.

12. Has your organization undertaken any energy efficient new construction projects in the last three years for which you did not apply for a financial incentive through an energy efficiency program?
( ) Yes, undertook energy efficient construction projects but did not apply for incentive. (If checked, go to 12A)
( ) No energy efficient construction projects were undertaken.
( ) No, an incentive was applied for. (If checked, go to 12B)
( ) Don't know

12A. Why didn't you apply for a financial incentive for that project?
( ) Didn't know whether project qualified for financial incentives
( ) Didn't know about financial incentives until after project was completed
( ) Didn't have time to complete paperwork for financial incentive application
( ) Too much paperwork for the financial incentive application
( ) Financial incentive was insufficient
( ) Other (please specify)

12B. Did you receive all of your incentives for these past energy efficient projects?
( ) Yes
( ) No
( ) Don't know

13. How did you learn of the New Construction Program? (Select all that apply)
( ) From a New Construction Program Representative
( ) A DCEO representative mentioned it
( ) The DCEO Website
( ) From a utility representative
( ) Brochures or advertisements
( ) Trade association or business group you belong to
( ) Trade journal or magazine
( ) Friend or colleague
( ) From a representative of the Smart Energy Design Assistance Center (SEDAC)
( ) From a representative of the Energy Resource Center (ERC)
( ) An architect, engineer or energy consultant

( ) Equipment vendor or building contractor
( ) Attended a conference workshop or seminar
( ) Past experience with the program
( ) An energy service company
( ) Other (please specify)

14. When did you learn of the New Construction Program?
    ( ) Before planning the project
    ( ) During the project planning and concept phase
    ( ) Once construction documents were completed but prior to beginning construction
    ( ) Once construction had begun but before completion of construction
    ( ) After construction was completed
    ( ) Some other time (please specify)
    ( ) Don't know

15. Before participating in the New Construction Program, had you completed new construction projects with similar levels of energy efficiency?
    ( ) Yes
    ( ) No

16. For the project you completed through the New Construction Program, did you have plans to build to the same efficiency level prior to participating in the program?
    ( ) Yes (If checked, go to 16A)
    ( ) No

    16A. For about how long did you have plans to complete the new construction project before finding out about the New Construction Program?
    ( ) Less than 6 months before
    ( ) 6-12 months later before
    ( ) 1-2 years later before
    ( ) 3-5 years later before
    ( ) More than 5 years before
    ( ) Don't know

    16B. Did your plans specify the design features related to the level of energy efficiency for the building?
    ( ) Yes
    ( ) No

    16C. Would you have gone ahead with the same design specifications if you had not participated in the program?
    ( ) Yes
    ( ) No

17. Did you have experience with DCEO energy efficiency programs prior to participating in the New Construction Program?
    ( ) Yes (If checked, go to 17A)
    ( ) No

17A. How important was previous experience with the DCEO programs in making your decision to build to this efficiency level?

( ) Very important
( ) Somewhat important
( ) Only slightly important
( ) Not at all important
( ) Don't know

18. Did you receive any advice or recommendations from the DCEO or another program representative regarding energy efficiency design features for this project?

( ) Yes (If checked, go to 18A)
( ) No

18A. If the program representative had not recommended the design features, how likely is it that you would have built to the same efficiency level anyway?

( ) Definitely would have built to the same level
( ) Probably would have built to the same level
( ) Probably would not have built to the same level
( ) Definitely would not have built to the same level
( ) Don't know

19. Did you receive any advice or recommendations from the Smart Energy Design Assistance Center (SEDAC) regarding energy efficiency design features for this project?

( ) Yes
( ) No

19A. If the SEDAC representative had not recommended the design features, how likely is it that you would have built to the same efficiency level anyway?

( ) Definitely would have built to the same level
( ) Probably would have built to the same level
( ) Probably would not have built to the same level
( ) Definitely would not have built to the same level
( ) Don't know

20. Would you have been financially able to build to this efficiency level without the financial incentive from the New Construction Program?

( ) Yes
( ) No

21. If the financial incentive from the New Construction Program had not been available, how likely is it that you would have built to the same level of efficiency anyway?

( ) Definitely would have built to the same level
( ) Probably would have built to the same level
( ) Probably would not have built to the same level
( ) Definitely would not have built to the same level
( ) Don't know

22. How did the availability of information and financial incentives through the New Construction Program affect the quantity (or number of units) of energy efficient equipment or design features that you implemented in the project? Did you incorporate more energy efficient equipment or design features than you otherwise would have without the program?
    ( ) Yes (If checked, go to 22A)
    ( ) No, Program did not affect quantity purchased and installed

    22A. Which additional energy efficient equipment or design features did you implement?

23. How did the availability of information and financial incentives through the New Construction Program affect the level of energy efficiency you built to? Did you build to a higher level of efficiency than you otherwise would have because of the program?
    ( ) Yes (If checked, go to 23A)
    ( ) No, program did not affect the level of efficiency.

    23A. Without the program, to what level of efficiency would you have built to?
    ( ) A lower energy efficiency level, but still above code
    ( ) Built to code
    ( ) Other (please specify)

24. How did the availability of information and financial incentives through the New Construction Program affect the timing of the energy efficient new construction project? Did you complete the project earlier than you otherwise would have without the program?
    ( ) Yes
    ( ) No, program did not affect the timing of the project

    24A. When would you otherwise have completed the project?
    ( ) Less than 6 months later
    ( ) 6-12 months later
    ( ) 1-2 years later
    ( ) 3-5 years later
    ( ) More than 5 years later

25. Did the implementation of the efficiency measures go smoothly?
    ( ) Yes
    ( ) For the most part (If checked, go to 25A)
    ( ) No (If checked, go to 25A)
    ( ) Don't know

    25A. Please explain in what ways project implementation did not go smoothly.

26. Did the energy efficiency measures you adopted for this project meet your expectations?
    ( ) My expectations were exceeded
    ( ) My expectations were met
    ( ) My expectations were mostly met (If checked, go to 26A)
    ( ) My expectations were not met (If checked, go to 26A)
    ( ) Don't know

26A. Please explain in what ways the energy efficiency measures did not meet your expectations.

27. Did you have any problems with the application process?
( ) Yes (If checked, go to 27A)
( ) No
( ) Don't know

27A. What problems did you have?

28. Do you feel you got a quality installation of the efficiency measures?
( ) Yes
( ) For the most part (If checked, go to 28A)
( ) No (If checked, go to 28A)
( ) Don't know

28A. Please explain in what ways you did not receive a quality installation.

29. Did the incentive agreement that you received meet your expectations?
( ) Yes
( ) No (If checked, go to 29A)
( ) Don't know

29A. Please explain in what ways the incentive you received did not meet your expectations.

30. Did anyone from the New Construction Program or other DCEO or SEDAC representative come to this facility to do a pre-inspection?
( ) Yes (If checked, go to 30A, 30B, 30C)
( ) No
( ) Don't know

30A. Who performed the inspection?

30B. What did the pre-inspection consist of?

30C. Did anything change in the project design as a result of the pre-inspection?
( ) Yes (If checked, go to 30D)
( ) No
( ) Don't know

30D. Please explain the way in which the project design changed as a result of the pre-inspection.

31. Did anyone from the New Buildings Program or other DCEO or SEDAC representative come to this facility to do a post-inspection?
( ) Yes (If checked, go to 31A, 31B, 31C)
( ) No

( ) Don't know

31A. Who performed the inspection?

31B. What did the post-inspection consist of?

31C. Did anything change in the incentive amount as a result of the post-inspection?
( ) Yes (If checked, go to 31D)
( ) No
( ) Don't know

31D. Please explain how the incentive amount changed as a result of the post-inspection.

32. Were there any issues receiving the incentive check?
( ) Yes (If checked, go to 32A)
( ) No
( ) Don't know

32A. Please describe the issues you had with receiving the incentive check.

33. Was the incentive amount what you expected?
( ) Yes (If checked, go to 33A)
( ) No
( ) Don't know

5.1.3 33A. Please explain how the incentive amount differed from what you expected.

34. Since participating in the New Construction Program, have you implemented any additional energy efficiency measures similar to those you implemented through the program that you did not apply or receive an incentive for?
( ) Yes (If checked, go to 34A-34F)
( ) No
( ) Don't know

34A. Did the additional energy efficiency measures result in the same or higher level of efficiency improvement as the measures implemented through the program?
( ) Yes, they were the same or higher efficiency
( ) No
( ) Don't know

34B. Were these additional measures implemented at the same facility (or facilities) as the new construction project completed through the program?
( ) Yes
( ) No; Where was the equipment installed? (please specify)
( ) Don't know

34C. Did a recommendation from a program staff member or contractor influence your decision to implement the additional measures?

( ) Yes (If checked, go to 34C1)
( ) No
( ) Don't know

34C1. How important was the recommendation from a program staff member or contractor to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neutral
( ) Somewhat unimportant
( ) Not important
( ) Don't know

34D. How important was your experience with the program or the energy efficient design features implemented through the program to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neutral
( ) Somewhat unimportant
( ) Not important
( ) Don't know

34E. How important was your participation in any past programs offered by DCEO to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neutral
( ) Somewhat unimportant
( ) Not important
( ) Don't know

34F. Why didn't you apply for or receive financial assistance or incentives for those items?

( ) Didn't know about financial incentives
( ) Didn't know whether the measures qualified for financial incentives
( ) Financial incentive was insufficient
( ) No financial incentive was offered
( ) Too much paperwork for the financial incentive application
( ) For some other reason (please describe)

35. Since participating in the program, have you implemented any other energy efficiency equipment that was not similar to what you implemented through the program and that you did not apply or receive an incentive for?

( ) Yes
( ) No
( ) Don't know

35A. What energy efficient equipment did you implement?

35B. Was this equipment installed at the same facility (or facilities) as the energy efficiency measures that you received an incentive for?

( ) Yes
( ) No; Where was the equipment installed? (please specify)
( ) Don't know

35C. Did a recommendation from a program staff member or contractor influence your decision to implement the additional measures?

( ) Yes
( ) No
( ) Don't know

35C1. How important was the recommendation from a program staff member or contractor to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neutral
( ) Somewhat unimportant
( ) Not important
( ) Don't know

35D. How important was your experience with the program or the energy efficient equipment or design features implemented through the program to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neutral
( ) Somewhat unimportant
( ) Not important
( ) Don't know

35E. How important was your participation in any past programs offered by DCEO to your decision to implement the additional energy efficiency measures?

( ) Very important
( ) Somewhat important
( ) Neutral
( ) Somewhat unimportant
( ) Not important
( ) Don't know

35F. Why didn't you apply for or receive financial assistance or incentives for those items?

( ) Didn't know about financial incentives
( ) Didn't know whether the measures qualified for financial incentives
( ) Financial incentive was insufficient
( ) No financial incentive was offered
( ) Too much paperwork for the financial incentive application

( ) For some other reason (please specify)

36. How would you rate your satisfaction with the following - Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied?

- Performance of the equipment installed
- Savings on your monthly bill
- Incentive amount
- The effort required for the application process
- Information provided by your contractor
- Quality of the work conducted by your contractor
- Information provided by DCEO
- Information provided by Smart Energy Design Assistance Center (SEDAC)
- Information provided by the Energy Resource Center (ERC)
- The elapsed time until you received the incentive
- Overall program experience

36L. (If very dissatisfied or somewhat dissatisfied for any) Please describe in what ways you were not satisfied with the program.

37. Do you have any other comments that you would like to relay to DCEO about energy efficiency in public entities or about their programs?

Thank you for taking our survey. Your response is very important to us.

# Appendix D: New Construction Survey Responses

As part of the evaluation work effort, a survey was made of a sample of decision makers for facilities that received incentives from the New Construction Program. The survey provided the information used in Chapter 3 to estimate free ridership for projects in the New Construction Program. However, the survey also provided more general information pertaining to the making of decisions to improve energy efficiency by program participants.

Each participant was interviewed using the survey instrument provided in Appendix B. The interviews were conducted by telephone or internet. During the interview, a participant was asked questions about (1) his or her general decision making regarding the decision to incorporate beyond-code efficiency improvements in the construction project, (2) his or her knowledge of and satisfaction with the program, and (3) the influence that the program had on his or her decision to implement the beyond-code efficiency improvements.

The following tabulations summarize participant survey responses. Two columns of data are presented. The first column presents the number of survey respondents (*n)*. The second column presents the percentage of survey respondents (*n)*.

| 3. What was your role in making the decision to implement the energy efficiency measures in the new construction project completed through the program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Main decision maker | 0 | 0% |
| | Assisted with the decision to implement the measure | 2 | 100% |
| | Was not part of the decision process | 0 | 0% |

| 4. What are the sources your organization relies on for information about energy efficient equipment, materials and design features? (Do not read list. Check all that apply) | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | A DCEO Representative | 0 | 0% |
| | The DCEO Website | 0 | 0% |
| | Utility representatives | 0 | 0% |
| | Brochures or advertisements | 0 | 0% |
| | Trade associations or business groups you belong to | 0 | 0% |
| | Trade journals or magazines | 0 | 0% |
| | Friends and colleagues | 0 | 0% |
| | Representatives of the Smart Energy Design Assistance Center (SEDAC) | 0 | 0% |
| | Representative of the Energy Resource Center (ERC) | 0 | 0% |
| | Architects, engineers or energy consultants | 2 | 100% |
| | Equipment vendors or building contractors | 1 | 50% |
| | Other (please describe) | 1 | 50% |

*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

| 5. Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? (Read list. Check all that apply) | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | An energy management plan | 1 | 50% |
| | A designated staff member responsible for energy tracking and energy efficiency | 0 | 0% |
| | Policies that incorporate energy efficiency in operations and procurement | 1 | 50% |
| | Active training of staff | 0 | 0% |
| | None | 1 | 50% |
| | Other (please specify) | 0 | 0% |

*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

| 5a. Does your energy management plan include goals for energy savings? | Response | (n=1) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 1 | 100% |
| | Don't know | 0 | 0% |

| 6. In your organization, how long does it typically take to get approval for new construction projects? | Respondant Average | |
|---|---|---|
| | Average Months | 2.0 |

| 7. What barriers does your organization face in developing energy efficient new construction projects? (Do not read list. Use as possible prompts. Select all that apply) | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | Insufficient funding for energy efficiency | 2 | 100% |
| | Lack of information on energy efficient equipment and design features | 0 | 0% |
| | Approval processes that slow or make incorporating energy efficiency difficult | 0 | 0% |
| | Incentive program time requirements | 0 | 0% |
| | Don't know | 0 | 0% |
| | Other (please specify) | 1 | 50% |

*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

| 8. Is your organization able to utilize incentive or grant payments you receive for energy efficiency improvements or are the payments placed in a general fund? (Do not read list. Use as possible prompts.) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | We are able to use the incentive payments for additional facility improvements, including additional energy efficiency improvements | 1 | 50% |
| | Incentive payments return to the facility general operating fund | 1 | 50% |
| | Incentive payments go into the state general revenue fund | 0 | 0% |
| | Don't know | 0 | 0% |
| | Other (please specify) | 0 | 0% |

| 9. How important are incentive payments from the DCEO for your decision making regarding implementing energy efficient equipment or design features? Would you say...(Read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Very important | 0 | 0% |
| | Somewhat important | 1 | 50% |
| | Only slightly important | 1 | 50% |
| | Not important at all | 0 | 0% |
| | Don't know | 0 | 0% |

| 10. How important is advice and/or recommendations received from DCEO for your decision making regarding implementing energy efficient equipment or design features? Would you say... (Read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Very important | 0 | 0% |
| | Somewhat important | 2 | 100% |
| | Only slightly important | 0 | 0% |
| | Not important at all | 0 | 0% |
| | Don't know | 0 | 0% |

| 11. Which financial methods does your organization typically use to evaluate energy efficiency investments? (Read list. Select all that apply) | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | Initial Cost | 0 | 0% |
| | Simple payback | 1 | 50% |
| | Internal rate of return | 0 | 0% |
| | Life cycle cost | 0 | 0% |
| | None of these | 1 | 50% |

*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

| 12. Has your organization undertaken any energy efficient new construction projects in the last three years for which you did not apply for a financial incentive through an energy efficiency program? (Do not read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes, undertook energy efficient construction projects but did not apply for incentive. | 0 | 0% |
| | No energy efficient construction projects were undertaken. | 0 | 0% |
| | No, an incentive was applied for. | 2 | 100% |
| | Don't know | 0 | 0% |

| 12b. Did you receive all of your incentives for these past energy efficient projects? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 2 | 100% |
| | No | 0 | 0% |
| | Don't know | 0 | 0% |

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 13. How did you learn of the New Construction Program? (Do not read list. Select all that apply) | From a New Construction Program Representative | 0 | 0% |
| | A DCEO representative mentioned it | 0 | 0% |
| | The DCEO Website | 0 | 0% |
| | From a utility representative | 0 | 0% |
| | Brochures or advertisements | 0 | 0% |
| | Trade association or business group you belong to | 0 | 0% |
| | Trade journal or magazine | 0 | 0% |
| | Friend or colleague | 1 | 50% |
| | From a representative of the Smart Energy Design Assistance Center (SEDAC) | 0 | 0% |
| | From a representative of the Energy Resource Center (ERC) | 0 | 0% |
| | An architect, engineer or energy consultant | 1 | 50% |
| | Equipment vendor or building contractor | 1 | 50% |
| | Attended a conference workshop or seminar | 0 | 0% |
| | Past experience with the program | 0 | 0% |
| | An energy service company | 0 | 0% |
| | Other (please specify) | 1 | 50% |

*Since respondents were able to select more than one response, the sum of the percentages in the table above can exceed 100%.

| | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| 14. When did you learn of the New Construction Program? Was it...(Read list) | Before planning the project | 1 | 50% |
| | During the project planning and concept phase | 0 | 0% |
| | Once construction documents were completed but prior to beginning construction | 0 | 0% |
| | Once construction had begun but before completion of construction | 1 | 50% |
| | After construction was completed | 0 | 0% |
| | Some other time (please describe) | 0 | 0% |
| | Don't know | 0 | 0% |

| 15. Before participating in the New Construction Program, had you completed new construction projects with similar levels of energy efficiency? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 2 | 100% |
| | Don't know | 0 | 0% |

| 16. For the project you completed through the New Construction Program, did you have plans to build to the same efficiency level prior to participating in the program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 2 | 100% |
| | Don't know | 0 | 0% |

| 17. Did you have experience with DCEO energy efficiency programs prior to participating in the New Construction Program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 1 | 50% |
| | No | 1 | 50% |
| | Don't know | 0 | 0% |

| 17a. How important was your previous experience with the DCEO programs in making your decision to build to this efficiency level? Would you say...(Read list) | Response | (n=1) | Percent of Respondents |
|---|---|---|---|
| | Very important | 0 | 0% |
| | Somewhat important | 1 | 100% |
| | Only slightly important | 0 | 0% |
| | Not at all important | 0 | 0% |
| | Don't know | 0 | 0% |

| 18. Did you receive any advice or recommendations from the DCEO or another program representative regarding energy efficiency design features for this project? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 2 | 100% |
| | No | 0 | 0% |
| | Don't know | 0 | 0% |

| 18a. If the program representative had not recommended the design features, how likely is it that you would have built to the same efficiency level anyway? Would you say...(Read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Definitely would have built to the same level | 1 | 50% |
| | Probably would have built to the same level | 0 | 0% |
| | Probably would not have built to the same level | 1 | 50% |
| | Definitely would not have built to the same level | 0 | 0% |
| | Don't know | 0 | 0% |

| 19. Did you receive any advice or recommendations from the Smart Energy Design Assistance Center (SEDAC) regarding energy efficiency design features for this project? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 1 | 50% |
| | No | 1 | 50% |
| | Don't know | 0 | 0% |

| 19a. If the SEDAC representative had not recommended the design features, how likely is it that you would have built to the same efficiency level anyway?(Read list) | Response | (n=1) | Percent of Respondents |
|---|---|---|---|
| | Definitely would have built to the same level | 0 | 0% |
| | Probably would have built to the same level | 1 | 100% |
| | Probably would not have built to the same level | 0 | 0% |
| | Definitely would not have built to the same level | 0 | 0% |
| | Don't know | 0 | 0% |

| 20. Would you have been financially able to build to this efficiency level without the financial incentive from the New Construction Program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 2 | 100% |
| | Don't know | 0 | 0% |

| 21. If the financial incentive from the New Construction Program had not been available, how likely is it that you would have built to the same level of efficiency anyway?(Read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Definitely would have built to the same level | 0 | 0% |
| | Probably would have built to the same level | 1 | 50% |
| | Probably would not have built to the same level | 1 | 50% |
| | Definitely would not have built to the same level | 0 | 0% |
| | Don't know | 0 | 0% |

| 22. How did the availability of information and financial incentives through the New Construction Program affect the quantity (or number of units) of energy efficient equipment or design features that you implemented in the project? Did you incorporate more energy efficient equipment or design features than you otherwise would have without the program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 2 | 100% |
| | No, Program did not affect quantity purchased and installed | 0 | 0% |
| | Don't know | 0 | 0% |

| 23. How did the availability of information and financial incentives through the New Construction Program affect the level of energy efficiency you built to? Did you build to a higher level of efficiency than you otherwise would have because of the program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 2 | 100% |
| | No, program did not affect the level of efficiency. | 0 | 0% |
| | Don't know | 0 | 0% |

| 23a. Without the program, to what level of efficiency would you have built?(Read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | A lower energy efficiency level, but still above code | 1 | 50% |
| | Built to code | 1 | 50% |
| | Other (please specify) | 0 | 0% |

| 24. How did the availability of information and financial incentives through the New Construction Program affect the timing of the energy efficient new construction project? Did you complete the project earlier than you otherwise would have without the program? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 1 | 50% |
| | No, program did not affect the timing of the project | 1 | 50% |

| 25. Did the implementation of the efficiency measures go smoothly? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 1 | 50% |
| | For the most part | 1 | 50% |
| | No | 0 | 0% |
| | Don't know | 0 | 0% |

| 26. Did the energy efficiency measures you adopted for this project meet your expectations? Would you say...(Read list) | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | My expectations were exceeded | 0 | 0% |
| | My expectations were met | 1 | 50% |
| | My expectations were mostly met (If checked, go to 26A) | 1 | 50% |
| | My expectations were not met | 0 | 0% |
| | Don't know | 0 | 0% |

| 27. Did you have any problems with the application process? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 1 | 50% |
| | Don't know | 1 | 50% |

| 28. Do you feel you got a quality installation of the efficiency measures? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 1 | 50% |
| | No | 1 | 50% |
| | Don't know | 0 | 0% |

| 29. Did the incentive agreement that you received meet your expectations? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 2 | 100% |
| | No | 0 | 0% |
| | Don't know | 0 | 0% |

| 30. Did anyone from the New Construction Program or other DCEO or SEDAC representative come to this facility to do a pre-inspection? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 1 | 50% |
| | Don't know | 1 | 50% |

| 31. Did anyone from the New Buildings Program or other DCEO or SEDAC representative come to this facility to do a post-inspection? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 0 | 0% |
| | Don't know | 2 | 100% |

| 32. Were there any issues receiving the incentive check? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 2 | 100% |
| | Don't know | 0 | 0% |

| 33. Was the incentive amount what you expected? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 2 | 100% |
| | No | 0 | 0% |
| | Don't know | 0 | 0% |

| 34. Since participating in the New Construction Program, have you implemented any additional energy efficiency measures similar to those you implemented through the program that you did not apply or receive an incentive for? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 2 | 100% |
| | Don't know | 0 | 0% |

| 35. Since participating in the program, have you implemented any other energy efficiency equipment that was not similar to what you implemented through the program and that you did not apply or receive an incentive for? | Response | (n=2) | Percent of Respondents |
|---|---|---|---|
| | Yes | 0 | 0% |
| | No | 2 | 100% |
| | Don't know | 0 | 0% |

| 36a. How would you rate your satisfaction with the performance of the equipment installed? | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | 5 | 0 | 0% |
| | 4 | 1 | 50% |
| | 3 | 0 | 0% |
| | 2 | 1 | 50% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 3.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| 36b. How would you rate your satisfaction with the savings on your monthly bill? | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| 36c. How would you rate your satisfaction with the incentive amount? | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36d. How would you rate your satisfaction with the effort required for the application process? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36e. How would you rate your satisfaction with the information provided by your contractor? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36f. How would you rate your satisfaction with the quality of the work conducted by your contractor? | 5 | 0 | 0% |
| | 4 | 1 | 50% |
| | 3 | 0 | 0% |
| | 2 | 1 | 50% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 3.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36g. How would you rate your satisfaction with the information provided by DCEO? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36h. How would you rate your satisfaction with the information provided by Smart Energy Design Assistance Center (SEDAC)? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36i. How would you rate your satisfaction with the information provided by the Energy Resource Center (ERC)? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36j. How would you rate your satisfaction with the elapsed time until you received the incentive? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)

| | Response | (n=2) | Percent of Respondents* |
|---|---|---|---|
| 36k. How would you rate your satisfaction with the overall program experience? | 5 | 0 | 0% |
| | 4 | 2 | 100% |
| | 3 | 0 | 0% |
| | 2 | 0 | 0% |
| | 1 | 0 | 0% |
| | Not Applicable | 0 | 0% |
| | Average | | 4.0 |

*Each response was assigned a numerical value from one to five (5=Very Satisfied, 4=Satisfied, 3=Neither Satisfied nor Dissatisfied, 2=Dissatisfied, 1=Very Dissatisfied)