NAVIGANT

# Smart Ideas for Your Business
# Standard Program
# EPY5 Evaluation Report

## Final

## Energy Efficiency / Demand Response Plan:
### Commonwealth Edison Company Plan Year 5
### (6/1/2012-5/31/2013)

## Presented to
### Commonwealth Edison Company

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## E. Executive Summary

This report presents a summary of the findings and results from the impact and process evaluation of the Commonwealth Edison Company (ComEd) EPY5[1] Smart Ideas for Your Business Standard program (named Prescriptive through EPY4). The EPY5 evaluation for the Standard Program continued the gross impact, net impact, and process evaluation activities that were conducted from EPY1 through EPY4, with adjustments to reflect changes to program elements and evaluation requirements that came into effect in EPY5. These changes include ComEd's comprehensive restructuring of business program delivery strategy in EPY5 that necessitates process evaluation and expand beyond program-specific research to include cross cutting issues. The Standard Program is available to all eligible, nonpublic, commercial and industrial customers in ComEd's service territory. KEMA Services Inc. is the program implementation contractor, responsible for day-to-day operations of the program.

The EPY5 gross impact evaluation approach reflects the partial reliance on the State of Illinois Energy Efficiency Technical Reference Manual (Illinois TRM) for deemed gross savings of some program measures, and the need to conduct evaluation research to estimate gross impacts for non-deemed measures. Navigant assigned projects into lighting and non-lighting end-use categories for sampling, analysis and reporting. Verified net energy and demand (coincident peak) savings were calculated by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). In PY5, the NTGR estimates used to calculate the Net Verified Savings were based on past evaluation research (EPY3) and defined through a negotiation process through SAG as documented in a spreadsheet.[2] The evaluation also conducted research with EPY5 participants for potential deeming in future program years. In EPY5, trade allies were interviewed to estimate spillover.

### *E.1. Program Savings*

Table E-1 summarizes the electric savings from the Business Standard Program.

**Table E-1. EPY5 Total Program Electric Savings**

| Savings Category † | Energy Savings (MWh) | Coincident Peak Demand Savings (MW) |
|---|---|---|
| Ex Ante Gross Savings | 262,295 | 42.2 |
| Ex Ante Net Savings | 186,382 | 29.7 |
| Verified Gross Savings | 261,525 | 42.1 |
| Verified Net Savings | 186,433 | 30.4 |

*Source: Utility tracking data (August 2, 2013) and Navigant analysis.*
*† See the Glossary in the Appendix for definitions*

[1] The EPY5 program year began June 1, 2012 and ended May 31, 2013.
[2] http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls

### *E.2. Program Savings by End-use Grouping*

Table E-2 below summarizes program savings by end-use category assigned by Navigant to each project, based on the predominant energy savings measure types. If project energy savings were entirely or more than half lighting, it was defined as a "Lighting" project. All other projects were defined as "Non-lighting" in the evaluation. The following two tables summarize the program savings by program channel and end-use groupings. Sample sizes for verifying gross realization rates provided a 90/3 (energy) and 90/9 (peak demand) level of confidence and relative precision for lighting projects, and 90/8 (energy) and 90/15 (peak demand) for non-lighting projects. When lighting and non-lighting results are combined for the program total, the levels of confidence and relative precision are 90/3 (energy) and 90/8 (peak demand).

**Table E-2. EPY5 Program Savings Results by End-Use Category**

| Savings Category | Lighting End-use | Non-Lighting End-use | Overall Program |
|---|---|---|---|
| **Energy Savings (MWh)** | | | |
| Ex Ante Gross Savings | 197,993 | 64,302 | 262,295 |
| Ex Ante Gross Savings (%) | 75% | 25% | 100% |
| Verified Gross Realization Rate | 1.02‡ | 0.92‡ | 1.00‡ |
| Verified Gross Savings | 202,396 | 59,128 | 261,525 |
| Net to Gross Ratio (NTGR) | 0.74† | 0.62† | 0.71† |
| Verified Net Savings | 149,773 | 36,660 | 186,433 |
| Verified Net Savings (%) | 80% | 20% | 100% |
| **Coincident Peak Demand Savings (MW)** | | | |
| Ex Ante Gross Savings | 29.0 | 13.2 | 42.2 |
| Ex Ante Gross Savings (%) | 69% | 31% | 100% |
| Verified Gross Realization Rate | 1.21‡ | 0.53‡ | 1.00‡ |
| Verified Gross Savings | 35.2 | 7.0 | 42.1 |
| Net to Gross Ratio (NTGR) | 0.74† | 0.62† | 0.72† |
| Verified Net Savings | 26.0 | 4.3 | 30.4 |
| Verified Net Savings (%) | 86% | 14% | 100% |

*Source: Utility tracking data (August 2, 2013) and Navigant analysis.*

‡ *Realization rate is based on EPY5 evaluation research findings. Reported program gross savings results have been rounded.*

† *NTG is a deemed value. Document provided by ComEd to the SAG summarizing the SAG-approved NTGR for ComEd for EPY5-EPY6 as agreed to through a consensus process in March-August 2013. Distributed in the SAG meeting on August 5-6, 2013. http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the Illinois SAG web site at http://ilsag.info*

### *E.3. Impact Estimate Parameters For Future Use*

The Navigant team conducted evaluation research into parameters used in impact calculations including those in the Illinois TRM. Some of those parameters are eligible for deeming for future

program years or for inclusion in future versions of the Illinois TRM. Table E-3 below includes the evaluation team's recommended parameters for future use.

**Table E-3. Impact Estimate Parameters for Future Use**

| Parameter | Value | Data Source |
|---|---|---|
| **Lighting Measures** | | |
| Free-ridership | 0.26 | EPY5 Evaluation Research |
| Spillover | 0.05 | EPY5 Evaluation Research |
| NTGR | 0.79 | EPY5 Evaluation Research |
| **Non-Lighting Measures** | | |
| Free-ridership | 0.31 | EPY5 Evaluation Research |
| Spillover | 0.06 | EPY5 Evaluation Research |
| NTGR | 0.75 | EPY5 Evaluation Research |

*Source: Navigant analysis.*

### *E.4. Participation Information*

Navigant review of the EPY5 Standard program tracking data found that a total of 3,234 participating customers completed 3,544 completed projects. Participants installed a total of 7,137 measures, with lighting end-use projects exceeding non-lighting end-use projects by a margin of three to one. Program participation detail is included in Table E-4 below.

**Table E-4. EPY5 Standard Program Participation Overview**

| Participation | Lighting End-Use | Non-Lighting End-Use | Total |
|---|---|---|---|
| Participants | 2,504 (77%) | 730 (23%) | 3,234 |
| Total Measures* | 5,821 (82%) | 1,316 (18%) | 7,137 |
| Installed Projects | 2,563 (72%) | 981 (28%) | 3,544 |

*Source: Utility tracking data (August 2, 2013) and Navigant analysis.*
** This is a project-level measure count based on type of measure, not quantities installed.*

### *E.5. Conclusions and Recommendations*

The following provides insight into key program findings and recommendations.[3]

**Program Participation**

**Finding 1.** Program participation (number of projects) in the Standard program decreased by 23% from EPY4 to EPY5, commensurate with a 21% drop in ex ante energy savings over the same period. Ex ante non-lighting energy savings grew from 53,799 in EPY4 to 64,302

[3] Finding and Recommendation numbering is sequential in Section 6, Conclusions and Recommendations. The same numbering used in Section 6 is carried over in the Executive Summary so that readers can identify results presented in both sections.

MWh in EPY5, a 20% increase. The non-lighting increase is a commendable result, given the complexity and breadth of measures involved. The ex ante lighting energy savings dropped from 279,231 MWh in EPY4 to 197,993 MWh in EPY5, a drop of 81,238 MWh (29%). The reduction in Standard program activity should be viewed in the context of ComEd's overall business strategy. Several lighting measures that were formerly in the Standard program were moved into the growing Business Instant Lighting Discount (BILD) program for EPY5, and the Small Business Energy Savings program that launched in EPY4 will also draw potential Standard program participants. The T12 market appears to be dwindling for the program.

**Recommendation 1.** To maintain or grow the Standard program as the T12 market phases out, ComEd should continue to pursue the strategy of targeting marketing efforts to specific measures, channels, and messages. ComEd should consider ongoing assessment of program results and trends on an end-use basis, potentially even at the measure level for key measures, to determine which are underperforming against savings potential and which are growing. A custom strategy could be developed for key measures, by business segment, and phase of technology adoption. ComEd should consider refining and delivering multiple marketing messages and delivery approaches to trigger different decision-makers to act. Attracting future customer participants for T12 retrofits may need a tailored set of sales messages and reasons for participating that resonate with these late adopting customers.

**Gross Realization Rates**

**Finding 2.** Although the energy and peak demand savings verification realization rates were 1.00 for the overall program, there were upward gross adjustments on lighting that balanced out downward savings adjustments on non-lighting measures. As the program emphasis on non-lighting measures increases, the Standard program overall could face increasing risk of downward evaluation adjustment. The program tracking ex ante estimates of lighting gross energy savings are conservative overall, but savings for non-lighting measures have inconsistent realization rate results across end-use and measures types, and evaluation adjustments were both higher and lower.

**Recommendation 2a.** The measure level findings identified in this report merit follow-up by ComEd and the Illinois TRM process. ComEd may want to consider adding an additional testing process after each update to the tracking system. The testing process could be prioritized to "high priority" and "low priority" measures, and include a demonstrative report-out in a group setting for high priority measures.

**Recommendation 2b.** Deemed and non-deemed non-lighting measures should be the emphasis for improving ex ante savings estimates. Among non-deemed measures, energy management control systems are the highest priority for further research. The Illinois TRM needs revisions to the Guest Room Energy Management measure, which has an error in the example calculation for peak demand savings, and evaluation research suggests the Illinois TRM may be overstating energy savings.

**Recommendation 2c.** ComEd should consider enhancing the pre- and post-installation verification approach on large chiller and variable speed drive projects to ensure eligibility.

**Net-to-Gross estimates**

**Finding 4.** The SAG process deemed separate NTG values for lighting and non-lighting savings in EPY5. The EPY5 free-ridership estimate used to calculate the NTGR was deemed by the Illinois Stakeholder Advisory Group (SAG) based on EPY3 evaluation research. Evaluation research in EPY3 examined only participant spillover, and assigned a value of zero based on participant survey responses. The deemed NTG for non-lighting energy savings of 0.62 with a relative precision of ± 30% and 90% level of confidence, while the deemed lighting NTG was 0.74 at a relative precision of ± 5% and 90% level of confidence. Evaluation research of NTG (free-ridership only) conducted on EPY5 participants found a value of 0.74 for lighting (90/5) and 0.69 for non-lighting (90/8). Evaluation research findings for spillover in EPY5 were estimated at 0.05 for lighting, and 0.06 for non-lighting savings.

**Recommendation 4.** The EPY5 research findings for NTG ratios for lighting (0.79, with spillover added) and non-lighting (0.75 with spillover) should be considered for future deeming. The non-lighting NTG ratios estimated prior to EPY5 were not significant at the 90/10 level.

**Program Participation and Marketing.**

**Finding 6.** Despite high satisfaction ratings, project participation in the Standard program decreased by 23% from EPY4 to EPY5, although that is in the context of a comprehensive business strategy with multiple program offerings. Program staff note that some trade allies asserted the economic recovery as a factor affecting participation, and staff also remarked that one of the key challenges in EPY5 was the ability to maintain customer and trade ally excitement for program offerings over time. As a part of an assessment of marketing strategies in EPY5, program staff identified several key market areas to target in EPY6 to increase participation.

**Recommendation 6a.** Program staff should coordinate closely with other Smart Ideas for Your Business Program elements, such as Business Instant Lighting Discounts (BILD), Custom, Small Business Energy Savings, Industrial Systems, and others that are relevant to the targeted market areas to review individual measures and channels that may be more effectively delivered through the Standard program. As noted in the Cross-Cutting Evaluation Report, trade allies and end-use customers may need to work with multiple program elements to meet their energy efficiency needs and should see the portfolio as a comprehensive solution. Efforts to increase coordination should streamline participation and remove barriers.

As a summary finding, participating customers were generally satisfied with the Standard program – 90 percent of the customers surveyed reported being satisfied with the program overall. The mean satisfaction score for the Smart Ideas Program overall was 8.5 on a 0-10 scale. A clear majority (79%) reported planning to participate in ComEd's Smart Ideas for Your Business Program again in the future. Respondents noted the primary benefits of participating in the program were the potential for energy savings (62%) followed by the opportunity for a rebate or incentive (28%). On the whole, respondents claimed that the program presents no drawbacks to participation (69%). Of those respondents who identified barriers to participation, most were concerned with the paperwork being too burdensome (13%).

# 1. Introduction

## 1.1 Program Description

ComEd offers standard incentives for common energy efficiency measures under the ComEd Smart Ideas for Your Business® Standard program (i.e. Standard program) to facilitate the implementation of cost-effective energy efficiency improvements for non-residential (commercial and industrial) customers. Eligible projects must involve new equipment installed at an existing facility that results in a permanent reduction in electrical energy usage (kWh). Eligible measures include energy-efficient indoor and outdoor lighting, HVAC equipment, refrigeration, commercial kitchen equipment, variable speed drives, compressed air equipment and other qualifying products.

To participate, an eligible customer submits an application with project documentation, including project specification sheets and copies of dated invoices for the purchase and installation of the measures. Installed measures must be in place for a period of five years or the life of the product, whichever is less. The Standard program offers pre-determined incentives and a streamlined application to help facilitate participation. Lighting retrofit projects make up the largest percentage of ex ante gross energy savings for this program, although the percentage of non-lighting savings has increased from a low of 6 percent in EPY2 to 25 percent in EPY5.

In EPY5, ComEd continued the marketing strategy of presenting its overall portfolio to customers in the marketplace under the Smart Ideas for Your Business program. This marketing and delivery strategy targets specific non-residential customers and market segments with a network of trade allies and service providers and financial incentives. Trade allies and service providers are a key strategy to promote the program to customers. The Standard program's design and structure remained largely unchanged from EPY4, though key updates were made to some the program's internal processes while increasing efforts to coordinate between program elements behind-the-scenes.

## 1.2 Evaluation Objectives

The Evaluation Team identified the following key researchable questions for EPY5:

### 1.2.1 Impact Questions

1. What are the verified program-level gross savings from lighting projects, non-lighting projects, and all measures installed through this program, based on analyzing a sample of projects with deemed and non-deemed per unit savings values?

2. What are the program-level gross impacts from lighting projects, non-lighting projects, and all measures installed through this program, based on *evaluation research findings*, not deemed values, from a sample of projects evaluated through site-specific interviews and on-site measurement and verification?

3. Are the ex-ante per-unit gross impact savings correctly implemented by the tracking system and reasonable for this program?

4. What are the research findings for free-ridership, spillover, and net impacts from EPY5 participants in this program, estimated separately for lighting and non-lighting measures?

### 1.2.2 Process Questions

The process evaluation questions focused on the following key questions:

1. What was the overall effectiveness of the program's delivery and processes?
2. How effective was the program's implementation?
3. What was the customer and program partner experience and how satisfied were customers and program partners with the program?
4. What are potential opportunities for improvement to the program and delivery approach?

# 2. Evaluation Approach

The EPY5 evaluation for the Standard program continued the gross impact, net impact, and process evaluation activities that were conducted from EPY1 through EPY4, with adjustments to reflect changes to program elements and evaluation requirements that came into effect in EPY5. For deemed measures, Navigant verified ex ante gross savings against the values and algorithms provided in the Illinois Statewide Technical Reference Manual (TRM).[4] For non-deemed measures with custom variable inputs, Navigant conducted evaluation research to verify gross impacts. In EPY5, Navigant assigned projects into lighting and non-lighting end-use categories for sampling, analysis and reporting of gross and net impacts. Sampling was designed to achieve a 90/10 level of confidence and relative precision separately for lighting and non-lighting, for gross and net research.

The Net-to-Gross Ratio (NTGR) estimates used to calculate Net Verified Savings were deemed through a consensus process by the Illinois Stakeholder Advisory Group[5] based on EPY3 evaluation research. Navigant conducted free-ridership research with EPY5 participating customers and spillover research with trade allies for potential deeming in future program years. Details of free ridership and spillover research conducted in the EPY5 evaluation are provided in Appendix 7-2.

For the process evaluation, Navigant conducted a limited process evaluation specific to the Standard program along with a cross-cutting process evaluation that examined the overall Smart Ideas for Your Business program delivery strategy implemented in EPY5.[6]

## 2.1 Primary Data Collection

### 2.1.1 Overview of Data Collection Activities

The core data collection activities included verification of the program tracking data, on-site measurement and verification (M&V) of sampled projects, engineering file review of sampled projects, and a telephone survey of participating customers, and telephone interviews with trade allies (including those that participated in the EPY5 Standard program and those that had not).

The full set of data collection activities is shown in Table 2-1 below.

[4] State of Illinois Technical Reference Manual. Final as of September 14, 2012, effective June 1, 2012. http://ilsagfiles.org/SAG_files/Technical Reference Manual/Illinois Statewide_TRM_Version_1.0.pdf

[5] Document provided by ComEd to the SAG summarizing the SAG-approved NTGR for ComEd for EPY5-EPY6 as agreed to through a consensus process in March-August 2013. Distributed in the SAG meeting on August 5-6, 2013. http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls

[6] Please see the ComEd Business Cross-Cutting Evaluation Report for full details of this evaluation activity.

**Table 2-1. Core Data Collection Activities**

| N | What | Who | Target Completes | Completes Achieved | When | Comments |
|---|---|---|---|---|---|---|
| *Impact Assessment* | | | | | | |
| 1 | Onsite M&V Audit | Participants | 42 | 42 | May – October 2013 | Comprised of 17 lighting and 25 non-lighting projects for gross impact analysis |
| 2 | Engineering Review | Participants | 78 | 78 | May – November 2013 | Comprised of 49 lighting and 29 non-lighting projects for gross impact analysis |
| 3 | Telephone Survey | Trade Allies Interviewed for Cross-Cutting Research that had Participated in the Standard Program | Up to 60 | 31 | May – September 2013 | Data collection supporting NTG and process analysis. |
| 4 | Telephone Survey | Trade Allies that Participated in EPY5 Standard Program | 30 | 30 | October – November 2013 | Data collection supporting NTG and process analysis. |
| *Process Assessment* | | | | | | |
| 5 | Telephone Survey | Participating Customers | 126 | 127 | May – September 2013 | Data collection for NTG research in same instrument for all Standard surveys. |
| 6 | In Depth Interviews | Program Manager/Implementer Staff | 4 | 4 | May – September 2013 | Includes staff from both ComEd and KEMA |

*Source: Navigant*

### 2.1.2 Verified Savings Parameters

Table 2-2 below presents the sources for parameters that were used in the verified gross and net savings calculations and indicates which were examined through EPY5 evaluation research and which were deemed.

**Table 2-2. Verified Gross and Net Savings Parameter Data Sources**

| Input Parameters | Data Source(s) | Deemed or Evaluated? |
|---|---|---|
| Installed Quantities | Program Tracking Data Analysis (August 2, 2013 extract); EPY5 evaluation on-site M&V. | Evaluated |
| Deemed Lighting Measure Savings Parameters: Hours of Use (HOU), Peak Load Coincidence Factor, Energy and Demand Interactive Effects | Illinois TRM v1.0 | Deemed |
| Lighting Measure Delta Watts (where deemed by the Illinois TRM) | Illinois TRM v1.0 | Deemed |
| Lighting Measure Delta Watts not deemed by the Illinois TRM | Program documentation and EPY5 M&V | Evaluated |
| Deemed HVAC, Food Service/Other, and Refrigeration Measures, principally: Electric Chillers, PTAC/PTHP, Guest Room Energy Management Controls, HVAC Variable Speed Drives, Air Compressor with Integrated VSD, EC Motors, Anti-Sweat Heater Controls | Illinois TRM v1.0 | Deemed |
| Non-deemed Non-lighting Measures, principally: Industrial Variable Speed drives, Energy Management Control Systems, Refrigeration Display Case/Doors; Refrigerated Cycling Dryers | Program documentation and EPY5 M&V | Evaluated |
| Gross Realization Rate | EPY5 evaluation M&V and Program Tracking Data Analysis | Evaluated |
| Lighting and Non-Lighting NTG Ratios | Illinois Stakeholder Advisory Group Process | Deemed† |

*† Document provided by ComEd to the SAG summarizing the SAG-approved NTGR for ComEd for EPY5-EPY6 as agreed to through a consensus process in March-August 2013. Distributed in the SAG meeting on August 5-6, 2013. http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls*

*‡ State of Illinois Technical Reference Manual. Final as of September 14, 2012, effective June 1, 2012. http://ilsagfiles.org/SAG_files/Technical Reference Manual/Illinois Statewide_TRM_Version_1.0.pdf*

### 2.1.3 Gross Program Savings Verification Analysis Approach

The verified gross savings analysis approach involved reviewing the ex-ante measure type to determine whether it is covered by the Illinois TRM or whether it is a non-deemed measure that is subject to retrospective per unit savings adjustment of custom variables. The measure type, deemed or non-deemed, dictated the verification approach.

- For Standard measures with per unit savings values deemed by the Illinois TRM, verified gross savings are estimated by multiplying deemed per unit savings by the verified quantity of eligible measures installed. To be eligible, a deemed measure must meet all physical, operational, and baseline characteristics required to be assigned to the deemed value as defined in the Illinois TRM.

- Measures with fully custom or partially-deemed ex-ante savings were subject to retrospective evaluation adjustments to gross savings on custom variables. For fully custom measures in the Standard program, Navigant considered all algorithm and parameter values to be open to evaluation adjustment. For partially-deemed measures, we applied TRM algorithms and deemed parameter values where specified by the TRM, and used evaluation research to verify custom variables. For measures with custom variables, ComEd provided workpaper documentation of savings, but verified savings were based on engineering review, billing data review, and on-site M&V of sampled measures to determine eligibility and per unit savings.

The evaluation activities to verify gross energy savings of the Standard Program were conducted in these steps:

1. Used the Illinois TRM and engineering review of tracking data to assess correct implementation of deemed values, and reasonableness of non-deemed values in the ex-ante gross savings estimates. We categorized ex ante measures as lighting or non-lighting, and defined lighting projects as those with a predominance of lighting energy savings, and all others as non-lighting projects. Navigant found that nearly all projects contained either lighting or non-lighting measures. Projects with a mix of lighting and non-lighting measures provided only about 1 percent of program ex ante gross savings.

2. Implemented a stratified random sampling design of lighting and non-lighting measures to select 120 projects (consisting of 66 lighting and 54 non-lighting projects) from the population of 3,544 Standard project applications and 7,137 Standard measures. Sampling was done in two waves with three sub-strata based on size. Sample sizes were designed provide a 90/10 confidence/relative precision level for program-level savings separately for lighting and non-lighting gross savings verification. Sampling to obtain statistically significant results by business type was considered, but the required sample size was considered too large.

3. Conducted on-site visits and measurement and verification (M&V) activities on a sample of 42 Standard projects (17 lighting and 25 non-lighting) selected from the 120 projects to support deemed and non-deemed measure savings verification and measure-level research. Lighting projects selected for on-site verification tended to be very large or complex projects. The selection of non-lighting projects for on-site verification was driven by project size and the need to site-verify non-deemed, non-lighting measures.

4. Conducted an engineering review of project files and energy savings estimates on the remaining 78 projects from the sample of 120 projects to support deemed and non-deemed measure savings verification and program-level research.

5. The verified gross savings are the product of verified per unit savings and verified measure quantities.

Table 2-3 below provides the sample selection by end-use category and stratification. The lighting measures accounted for 68 percent of the sample MWh savings, and the non-lighting measures accounted for 32 percent. Overall the sample represented 11 percent (28,767 MWh) of the population ex ante savings of 262,295 MWh.

The sample selection did not include 319 projects that accounted for 6 percent of program savings. These were smaller Standard projects, mostly lighting and refrigeration measures that had been tracked with custom measures due to a limitation with the tracking system. The projects were not included in the Standard population when the second wave of sampling occurred in July 2013. Working with ComEd, the Custom and Standard evaluation teams confirmed program assignments of these measures, resulting in transfer of these projects to the Standard evaluation population in August 2013.[7] Precision targets were met without sampling from the excluded projects.

[7] Email with attachment from Neal Latham of ComEd, August 23, 2013.

**Table 2-3. Profile of the EPY5 Population and Gross Savings Verification Sample by End-Use Strata**

| Population Summary | | | | | Sample | |
|---|---|---|---|---|---|---|
| Population Group | Sampling Strata | Number of Project (N) | Ex Ante Gross Savings, MWh | MWh Weights | No. of Projects (n) | Ex Ante Gross Savings, MWh |
| Lighting Wave 1 | 1 | 75 | 44,159 | 22% | 18 | 11,988 |
| | 2 | 241 | 44,482 | 22% | 18 | 3,086 |
| | 3 | 1,420 | 44,577 | 23% | 18 | 635 |
| Lighting Wave 2 | 1 | 29 | 17,939 | 9% | 4 | 3,359 |
| | 2 | 121 | 22,659 | 11% | 4 | 478 |
| | 3 | 640 | 20,459 | 10% | 4 | 157 |
| Excluded from sample | | 37 | 3,718 | 2% | 0 | 0 |
| ***Lighting Subtotal*** | | ***2,563*** | ***197,993*** | ***100%*** | ***66*** | ***19,703*** |
| Non-Lighting Wave 1 | 1 | 20 | 7,297 | 11% | 12 | 4,656 |
| | 2 | 63 | 6,689 | 10% | 12 | 1,283 |
| | 3 | 245 | 7,128 | 11% | 12 | 397 |
| Non-Lighting Wave 2 | 1 | 26 | 11,449 | 18% | 6 | 1,800 |
| | 2 | 78 | 8,536 | 13% | 6 | 679 |
| | 3 | 267 | 10,900 | 17% | 6 | 249 |
| Excl. from sampling | | 282 | 12,304 | 19% | 0 | 0 |
| ***Non-Lighting Subtotal*** | | ***981*** | ***64,302*** | ***100%*** | ***54*** | ***9,063*** |
| **Program Total** | | **3,544** | **262,295** | **100%** | **120** | **28,767** |

*Source: Utility tracking data (August 2, 2013) and Navigant analysis.*

### 2.1.4 Net Program Savings Analysis Approach

Verified net energy savings for lighting and non-lighting projects was calculated by multiplying the verified gross savings by a deemed net-to-gross ratio (NTGR). In EPY5, the NTGR estimates used to calculate the net verified savings were deemed through a consensus process by the Illinois Stakeholder Advisory Group (SAG)[8] based on EPY3 evaluation research. The SAG process assigned separate NTG values for lighting and non-lighting savings.

For the NTG research efforts in EPY5, Navigant conducted telephone surveys with participating customers and trade allies. Navigant conducted free-ridership research with EPY5 participating

[8] Document provided by ComEd to the SAG summarizing the SAG-approved NTGR for ComEd for EPY5-EPY6 agreed to through a consensus process in March-August 2013. Distributed in the SAG meeting on August 5-6, 2013. http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls

customers and spillover research with trade allies for potential deeming in future program years. Research for both groups used a self-report method. The survey instruments are included in Appendix 7.5.

### 2.1.5 Process Evaluation Methods

The EPY5 process evaluation included two components. Navigant conducted a limited process evaluation specific to the Standard program to address program-specific process evaluation topics. In addition, a cross-cutting process evaluation examined the overall Smart Ideas for Your Business program delivery strategy, which includes the Standard program.[9]

**Program Staff Interviews**
The evaluation team conducted an in-depth interview with the program manager of the Standard program at ComEd. This call covered program performance and any key changes to the program design and implementation for EPY5, along with planned changes for EPY6. The evaluation team also conducted an interview with staff members at KEMA responsible for program implementation. This interview explored program performance, key changes to implementation and design strategies in EPY5, and other areas affecting customer participation and satisfaction.

**Telephone Survey with Standard Program Participating Customers**
A telephone survey was conducted with a stratified random sample of 127 Standard program participants – 63 implementing lighting projects and 64 with non-lighting projects. This survey focused on two key areas: (1) questions to estimate free-ridership and participant spillover, and (2) questions to support the process evaluation. All CATI surveys were completed in September and October, 2013.

The CATI survey was directed toward unique customer contact names drawn from the tracking system for EPY5 paid Standard projects. The survey data collected supports EPY5 free-ridership estimation (to be used prospectively), process evaluation inputs (including business demographics), and a qualitative assessment of spillover. The CATI survey instrument used for this evaluation is included in Appendix 7.5.

**Business Cross-Cutting Process Research**
In addition to the program-specific process research summarized above, the evaluation team conducted cross-cutting process research for the entire portfolio of ComEd business offerings, the ComEd Smart Ideas for Your Business program. These process evaluation activities included interviews with ComEd program managers (9), program implementers (20), trade allies (60), program participants (100), and "drop out" participants (53), or customers whose projects were not completed through ComEd program offerings. This research did not solely focus on one individual program, but rather focused on analyzing how the Smart Ideas for Your Business portfolio functions as a whole, to gain insight into how the different elements of the programs are working together and identify areas where overall coordination can potentially be improved.

[9] Please see the ComEd Business Cross-Cutting Evaluation Report for full details of this evaluation activity.

This report draws upon process findings from the cross-cutting evaluation research where applicable to the Standard program. For additional information, please refer to the Business Cross-Cutting Evaluation Report.

The crosscutting trade ally survey included a set of questions to estimate spillover, without distinction between spillover occurring in participating or non-participating customers. Of the 60 trade ally interviews, 31 participated in the Standard program in EPY5, and provided part of the sample used to estimate Standard program spillover. The crosscutting research included interviews with 29 business sector trade allies that did not participate in the EPY5 Standard program.

**Supplemental Telephone Survey with Standard Program Participating Trade Allies**

After the crosscutting research was completed, a second telephone survey was conducted with a supplemental sample of 30 additional Standard program trade allies that had participated in EPY5. This supplemental survey included an expanded set of questions to quantify spillover, explore trade ally and customer behavior, and obtain insight on the T12 lighting phase-out. This CATI survey was completed in October and November, 2013.

# 3. Gross Impact Evaluation

The Standard Program in EPY5 achieved overall verified gross savings of 261,525 MWh. The verified gross savings for lighting end-use measures is 202,396 MWh at a gross realization rate of 1.02. The verified gross savings for non-lighting measures is 59,128 MWh at a gross realization rate of 0.92. Results of our EPY5 evaluation activities to verify the Standard program savings are presented in this section.

### 3.1.1 Tracking System Review

Navigant conducted a consistency check on the August 2, 2013 Standard Program tracking system extract to confirm whether the EPY5 data in the Frontier tracking system[10] – its stored lookup values for per unit energy and demand savings and reported ex-ante energy and demand savings – were consistent with the Illinois TRM deemed values[11], and with per unit savings values produced by KEMA[12] in the ComEd Workpapers for non-deemed measures and custom variables in the Standard program. We examined values for per unit energy savings and coincident peak demand at the measure level in the following manner:

- Does the applicable TRM deemed unit value match the lookup table value in the tracking system?
- Does the TRM deemed unit savings value match a per unit savings value we derived from measure-level ex ante savings and quantities reported in the tracking system? That is, we divided the reported energy and demand savings for each installation of a measure by the reported quantities to catch inappropriate data.
- Do the per unit savings values presented in the ComEd PY5 Workpapers match the per unit savings values we derived from measure-level ex ante savings reported in the tracking system?

Navigant found that some measure savings were missing values in the Frontier tracking database even though ex ante quantities were not zero. Most lighting measures were deemed based on the Illinois TRM method, while others were based on ComEd documentation for wattages and derived hours of use values which in some cases do not match exactly with the TRM. Tracking system energy and demand savings for compressed air systems and the HVAC end-use measures were consistent with the TRM in the review check, although a few individual measures had missing savings in the Frontier lookup table.

Navigant did not make evaluation savings adjustments on measures with observed tracking system errors unless the measures were also in the gross savings verification sample. Errors observed in the

[10] EPY5 tracking database extract dated 8/02/2013 downloaded from the ComEd SharePoint.
[11] We reviewed the Illinois TRM (9/14/2012 version) deemed savings values that provided the basis for a comparison check with deemed values stored in the extract of the Frontier database system for specific measure categories.
[12] ComEd Workpapers (KEMA lookup tables 6/2012 and 8/2012 updates) including *Comed_Default_Savings_Ltg_Calcs_6-22-12_V2; VSD_Lookup_Table_Frontier_Check_8-28-12; ComEd_Refrigeration_Savings_6-7-12*

deemed measure gross savings were adjusted to match the TRM, while non-deemed measures were evaluated on a custom basis. Listed below are specific findings that may need KEMA and ComEd attention to improve the program tracking system.

*Lighting End-use Measures*

1. The Frontier system lookup unit values are missing (or zero) for some lighting measures (observed in U-tube lamps, LED fixtures, ceramic discharge lamps, and garage/exterior LED or induction fixtures). For instance, project #12796 received incentive payment for installing garage/exterior LED or induction fixtures, but was recorded in the tracking system with zero savings.
2. The Frontier system EPY5 lighting measures lookup delta wattages do not match the TRM for all measures (RW/HP T8 lamps, LED lamps, Hardwired CFLs, etc.), although other parameters in the savings algorithm matched the TRM (hours of use, HVAC interaction factors, coincidence factors). Verified savings from these measures (if sampled) were adjusted by treating the delta watts as a custom variable input, but not adjusting other parameters if they matched the TRM.
3. The peak demand reduction generated by the Frontier tracking system for occupancy sensor measures was low by a factor of 10 to 15, depending on the building type. It appears that the tracking system did not apply the correct per unit peak demand savings because the underlying calculation by ComEd did not match the TRM. This was a substantial factor that increased the verified gross peak demand savings for lighting, because occupancy sensors are a prominent measure in the ComEd program (occupancy sensors are 6% of Standard program ex ante energy savings). The ex ante per unit energy savings was within about 10 percent of the deemed values that the evaluation calculated using the TRM. The differences were due to ComEd using an average energy savings factor for all occupancy sensor lighting (0.335), rather than distinguish between wall or ceiling mounted sensors (0.41) and fixture mounted sensors (0.30).
4. ComEd's EPY5 building-specific lighting parameters (e.g., hours of use) for some building types do not map one-for-one with the TRM building types. For instance, the ComEd K-12 building type is mapped from an average of TRM values for elementary school and high school/middle school. Similarly for the medical building type, an average is taken from TRM healthcare clinic and hospital buildings. The resulting measure savings for ComEd medical and K-12 building types are not directly deemed by the TRM. We evaluated hours of use in these cases as a custom variable.
5. ComEd's application forms for lighting to not collect data on whether an indoor space is cooled or uncooled. The Illinois TRM distinguishes between cooled and uncooled spaces for waste heat interaction factors applied to per unit savings. ComEd uses the "cooled" waste heat interaction factors for indoor lighting by building type. Prior to the adoption of the Illinois TRM, ComEd weighted cooled and uncooled buildings into a single average value on building types that are frequently uncooled (industry and warehouse). For EPY5, an evaluation on-site finding of indoor lighting installed in an uncooled space would result in the per-unit savings calculated using waste heat interaction factors of 1.0, for uncooled buildings.

*HVAC_VSD End-use Measures*

6. The following VSD measures were observed with missing or zero default savings in the Frontier tracking data: BEF_ALL_ALL, CHWP_ALL_ALL and MAF_ALL_ALL[13].

*Refrigeration End-use Measures*

7. For the *lighting controls for closed refrigerated case* measure, KEMA's Workpaper default savings is 252.5 kWh compared to Frontier's 169.99 kWh. Further clarification is needed from ComEd or KEMA to justify what parameters may have changed to reflect actual condition in the ComEd program territory.

*HVAC Cooling Equipment Measures*

8. Project #15912 was paid but with zero savings in the tracking data for installing the PTAC measure. We checked the Frontier system and found that this project had over-written savings, though there was no reason stated for doing so. Similarly, project #16038 installed PTACs but with zero savings. It was noted, however, that not all PTAC projects had zero savings in the tracking database.

*Other Measures*

a. The following measures provide the majority of savings in ComEd's "OTHER" End-Use: Combination Oven, Hot Food Holding Cabinet, Hotel Guest Room Energy Management (dominant), HVAC Economizer, Industrial 3 phase HF Battery Charger, Pre-Rinse Sprayer, and Doors (for refrigeration cooler cases). Although this end-use includes HVAC and refrigeration measures, we have kept them in this grouping to be consistent with ComEd savings tracking.
b. The tracking system value for Guest Room Energy Management peak demand savings was 1.25 kW per room controller installed. The value of 1.25 kW per unit is shown in a sample equation in the Illinois TRM: "kW = (12/8.344) x 0.5 x 0.3 = 1.25 kW per ton or room." The TRM then states that: "Coincident kW savings = 1.25 * 0.67 = 0.84." However, the TRM result is incorrect because it does not match the equation: kW = (12/8.344) x 0.5 x 0.3 = 0.22 kW per ton or room, and the Coincident kW savings = 0.22 * 0.67 = 0.145 kW per unit. This error was a significant contributor to lowering the verified gross realization rate on non-lighting demand savings.
c. There appears to be savings over-write for the commercial kitchen demand ventilation control (#19708) and for the Energy Star vending machine measures (#17823) so that ex ante savings for these measures are zero.

[13] BEF = Building exhaust fan, CHWP = Chilled water pump, MAF = make-up air fan, and ALL refers to applications where fan type and base control not specified.

### 3.1.2 Program Volumetric Findings

Navigant review of the EPY5 Standard program tracking data found that a total of 3,234 participating customers completed 3,544 completed projects. Participants installed a total of 7,137 measures, with lighting end-use projects exceeding non-lighting end-use projects by a margin of three to one. Program participation detail is included in Table 3-1 below.

**Table 3-1. EPY5 Primary Participation Detail**

| Participation | Lighting End-Use | Non-Lighting End-Use | Total |
|---|---|---|---|
| Participants | 2,504 (77%) | 730 (23%) | 3,234 |
| Total Measures* | 5,821 (82%) | 1,316 (18%) | 7,137 |
| Installed Projects | 2,563 (72%) | 981 (28%) | 3,544 |

*Source: Utility tracking data (August 2, 2013) and Navigant analysis.*
**- This is a project-level measure count based on type of measure, not quantities installed.*

The results of the on-site M&V and engineering file reviews determined the measure-level verified gross savings for the sampled projects. The volumetric findings for adjustments to quantities made to estimate the verified gross savings are summarized below and presented in Table 3-2.

1. Navigant verified that 14 of 297 sampled measures (5%) had some or all units of the measure to be ineligible, resulting in an evaluation verified gross savings realization rate of zero for ineligible quantities. Adjustments are shown in Table 3-2 below.
2. After conducting on-site visits and file reviews to verify gross energy savings, we made three types of adjustments on 38 of 297 sampled measures (13 percent) that we would categorize as verified information not matching tracking system information that would be gathered from the application form submittal or pre- and post-inspection. A common adjustment that tended to result in a verified gross savings realization rate less than 1.00 was a finding that verified quantities did not match ex-ante quantities. Generally, these were minor quantity reductions or adjustments that occurred in lighting projects, with a few instances of verified quantities that were higher than tracking system reporting.
3. On some projects, the verified business type or measure type was changed (five projects had their business type changed), and these adjustments result in evaluation verified gross realization rates both higher and lower than 1.0.
4. There were adjustments made to delta watts on some lighting measures that were either not deemed in EPY5 or the tracking system did not match the deemed delta watts in the Illinois TRM as noted in the tracking system review. This type of adjustment affected demand and energy savings.

**Table 3-2. Projects with Adjustments due to Ineligible Quantities, EPY5 Standard Program**

| Project ID | Measure Description | Summary of Adjustment |
|---|---|---|
| 12075 | Metal Halides (Pulse start or Ceramic) 100W or less | Invoice indicates (1) 60W PSMH claimed was not purchased and installed. |
| 15079 | HP T8 (4') and ballast | The quantities listed in project documentation were inconsistent with the higher claimed quantities. |
| 15252 | HVAC_VSD - CHWP-MISC-ALL-Chilled Water Pump - w/Other Base C | Measure does not meet the requirements of the program. The pump is not a chilled water pump and it is actually a pump for a 2-pipe system |
| 16611 | Time Clocks for Lighting-Exterior | Measure was disqualified because of manual control |
| 16720 | WSP-ALL-ALL-Water Supply/Waste Water Pump - w/All | Pump operates as a back-up pump. No additional savings are generated by the installation of the VSD on this pump. There are no savings attributable. |
| 16825 | HVAC_VSD - HWP-ALL-ALL-Hot Water Circulation Pump - w/All Ty | The (2) VFD controlled 10 HP hot water pumps did not qualify for the program. The VFD is manually set to run the motor at a specific speed and does not utilize any feedback controls to modulate the speed of the motor. |
| 16825 | HVAC_VSD - PM-ALL-ALL-Other Pump - w/All Types | The (2) VFD controlled 30 HP dual temperature water pumps did not qualify for the program. The VFD is manually set to run the motor at specific speed. No feedback controls to modulate the speed of the motor. |
| 16993 | LIGHTING - 2' Lamp and Ballast | Replacement of (52) 2-lamp 4'UT12 fixtures with (52) 2-lamp 2'T8 fixtures. The retrofit of these fixtures involved two separate measures; delamping and 2' Lamp and Ballast installation. |
| 17659 | One 8-ft T12 Lamp to two 4-ft HP T8 Lamps and Ball | The wattage of the 4' 2-lamp T8 fixtures, 76W, was found on the spec sheet to be higher than the value used in the ex ante calculations. |
| 17761 | Chiller | Full load efficiency does not meet Illinois TRM requirements. |
| 17811 | HVAC_VSD - WSP-ALL-ALL-Water Supply/Waste Water Pump - w/All | The savings were set to zero on one unit due to operation of the pump: (1) 100HP pump operates at a time while the other serves as a backup. Thus, only (1) VFD controlled 100HP booster pump is eligible. |
| 7616 | 4' U Tube T8 and Ballast | A single 2-lamp T12 U-tube fixture was replaced with a single 2-lamp T8-U-tube fixture. Based on the tracking system data, no savings were claimed for this eligible measure, but the rational for this was not clear. Evaluation verified savings for this installation. |
| 15227 | Occupancy Sensor | Additional fixtures installed were equipped with occupancy sensors, the total wattage of fixtures controlled was adjusted upward to match on-site finding. |
| 18139 | 3' Lamp and Ballast | The lamps do not qualify for incentive. The CRI of 78 does not meet requirement of >80. Also the wattage of the lamp is required to be <20W. |

*Source: Savings verification and analysis*

### 3.1.3 Gross Program Impact Parameter Estimates

The gross impact parameters are presented in Table 3-3 below.

**Table 3-3. Verified Gross Savings Parameters**

| Gross Savings Input Parameters | Value | Deemed or Evaluated? ‡ |
|---|---|---|
| Quantity | Varies | Evaluated |
| Measure Type and Eligibility | Varies | Evaluated |
| Gross Savings per Unit, Sampled Deemed Measures | Varies | Deemed |
| Gross Savings per Unit, Sampled Non-Deemed Measures | Varies | Custom Variables Evaluated |
| Verified Realization Rate on Ex-Ante Gross Savings (Lighting) | 1.02 (kWh), 1.21 (kW) | Evaluated |
| Verified Realization Rate on Ex-Ante Gross Savings (Non-Lighting) | 0.92 (kWh), 0.53 (kW) | Evaluated |

*‡ State of Illinois Technical Reference Manual. Final as of September 14, 2012, effective June 1, 2012. http://ilsagfiles.org/SAG_files/Technical Reference Manual/Illinois Statewide_TRM_Version_1.0.pdf; Comed_Default_Savings_Ltg_Calcs_6-22-12_V2; Tracking data (8-02-2013 extract.*

The savings verification realization rate for lighting coincident peak demand savings were significantly higher than ex-ante coincident peak demand primarily because of improperly calculated ex ante demand savings for occupancy sensors. The savings verification non-lighting coincident peak demand savings were significantly lower than ex-ante peak demand because of improperly over-estimated ex ante demand savings for guest room energy management systems, and instances of ineligible measures described in Table 3-2, notably chiller and HVAC variable speed drive measures.

### 3.1.4 Development of the Realization Rate

The verified gross energy realization rate (defined as the ratio of the verified gross energy savings to ex-ante gross energy savings as reported in the tracking system) was estimated as 1.02 for the lighting sample projects (at 90 confidence level and 3% relative precision for energy) and 0.92 for the non-lighting sample projects (at 90 confidence level and 8% relative precision for energy). The verified gross realization rates were then applied to the total program ex-ante gross savings for lighting and non-lighting end uses, using stratified ratio estimation sampling-based approach that are described in greater detail in the Appendix. The summation of the lighting and non-lighting results are evaluation verified gross savings for the Standard Program, provided in Table 3-4 and Table 3-5 .[14]

[14] The term "verified gross savings" is used to describe the overall program savings, even though non-deemed measures were subject to retrospective adjustment for EPY5. The savings in the EPY5 Standard Program were dominated by TRM deemed measure savings.

**Table 3-4. EPY5 Lighting Gross Realization Rates and Relative Precision at 90% Confidence Level**

| Population Group | Sampling Strata | Lighting End-use | | | |
|---|---|---|---|---|---|
| | | Mean kWh RR | kWh Relative Precision at 90% Level of Confidence ± % | Mean KW RR | KW Relative Precision at 90% Level of Confidence ± % |
| Lighting Wave 1 | 1 | 1.04 | 5% | 1.19 | 6% |
| | 2 | 0.98 | 2% | 1.42 | 32% |
| | 3 | 1.03 | 8% | 1.07 | 7% |
| Lighting Wave 2 | 1 | 1.09 | 14% | 1.24 | 16% |
| | 2 | 0.97 | 9% | 1.29 | 33% |
| | 3 | 1.04 | 3% | 1.22 | 27% |
| ***Lighting Subtotal*** | | 1.02 | 3% | 1.21 | 9% |

*Source: Evaluation Team analysis.*

**Table 3-5. EPY5 Non-Lighting Gross Realization Rates and Relative Precision at 90% Confidence Level**

| Population Group | Sampling Strata | Non-Lighting End-use | | | |
|---|---|---|---|---|---|
| | | Mean kWh RR | kWh Relative Precision at 90% Level of Confidence ± % | Mean Coincident Peak KW RR | KW Relative Precision at 90% Level of Confidence ± % |
| Non-Lighting Wave 1 | 1 | 0.84 | 16% | 0.23 | 23% |
| | 2 | 1.00 | 0% | 1.00 | 0% |
| | 3 | 0.88 | 17% | 0.32 | 34% |
| Non-Lighting Wave 2 | 1 | 1.13 | 30% | 1.00 | 5% |
| | 2 | 0.70 | 32% | 0.32 | 90% |
| | 3 | 0.90 | 18% | 0.17 | 83% |
| ***Non-Lighting Subtotal*** | | 0.92 | 8% | 0.53 | 15% |

*Source: Evaluation Team analysis.*

The particularly low realization rates on non-lighting coincident peak demand savings in Table 3-5 show the impact of over-estimated ex ante demand savings for guest room energy management systems and instances of ineligible measures. Ineligible measures were a significant factor lowering the non-lighting verified energy savings realization rate. Three of six sampled energy management control system (EMS) projects had low verified energy savings realization rates (under 0.20), and this reduced the verified energy realization rate. The EMS measure is non-deemed.

### 3.1.5 Verified Gross Program Impact Results

The resulting total program verified gross energy savings is 261,525 MWh (202,396 MWh for lighting measures and 59,128 MWh for non-lighting measures) and coincident peak demand savings of 42.1 MW (35.2 MW for lighting measures and 7.0 MW for non-lighting measures). Table 3-6 shows verified gross savings in groupings where the evaluation research supports estimates at 90/10 confidence or better.

**Table 3-6. EPY5 Verified Gross Impact Savings Estimates**

| End-use Category | Sample Size | Energy Savings (MWh) | Coincident Peak Demand Savings (MW) |
|---|---|---|---|
| **Lighting Measures** | | | |
| Ex-Ante PY5 Gross Savings | 66 | 197,993 | 29.0 |
| Realization Rate | | 1.02 | 1.21 |
| Verified Gross Savings | | 202,396 | 35.2 |
| **Non-Lighting Measures** | | | |
| Ex-Ante PY5 Gross Savings | 54 | 64,302 | 13.2 |
| Realization Rate | | 0.92 | 0.53 |
| Verified Gross Savings | | 59,128 | 7.0 |
| **ComEd EPY5 Total** | | | |
| Ex-Ante PY5 Gross Savings | 120 | 262,295 | 42.2 |
| Realization Rate | | 1.00 | 1.00 |
| Verified Gross Savings | | 261,525 | 42.1 |

*Source: Evaluation Team analysis.*

Although the energy and peak demand savings verification realization rates were 1.00 for the overall program, there were upward gross adjustments on lighting that balanced out downward savings adjustments on non-lighting measures. The program tracking ex ante estimates of lighting gross energy savings are conservative overall, but savings for non-lighting measures have inconsistent realization rate results across end-use and measures types, and evaluation adjustments were both higher and lower but overall combining for realization rates less than one.

## 4. Net Impact Evaluation

Verified net energy savings for EPY5 Standard program was calculated separately for lighting and non-lighting end-use categories by multiplying the EPY5 verified gross savings by a deemed Net-to-Gross Ratio (NTGR). Verified gross savings were determined by evaluation savings verification and research. The NTG values of 0.74 for lighting and 0.62 for non-lighting used to calculate EPY5 verified net savings were deemed through a consensus process by the Illinois Stakeholder Advisory Group (SAG)[15] based on EPY3 evaluation research. The lighting EPY3 NTGR was statistically significant at the 90/10 level, but the non-lighting NTGR did not meet 90/10. As shown in Table 4-1 below, the Standard program achieved verified net savings of 186,433 MWh and verified net peak demand savings of 30.4 MW. For lighting measures, Navigant calculated verified net savings of 149,773 MWh and verified net peak demand savings of 26.0 MW. For non-lighting measures, Navigant calculated verified net savings of 36,660 MWh and verified net peak demand savings of 4.3 MW.

Participating customer free ridership and trade ally spillover research was conducted in EPY5 for potential future application. The research methods and results are presented in Appendix 7.2.1.

[15] Document provided by ComEd to the SAG summarizing the SAG-approved NTGR for ComEd for EPY5-EPY6 as negotiated in March-August 2013. Distributed in the SAG meeting on August 5-6, 2013. http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls

**Table 4-1. EPY5 Standard Verified Net Impact Savings Estimates by Measure Category**

| End-use Category | Sample Size | Energy Savings (MWh) | 90/10 Significance ? | Coincidence Peak Demand Savings (MW) | 90/10 Significance ? |
|---|---|---|---|---|---|
| **Lighting Measures** | | | | | |
| Ex-Ante PY5 Gross Savings | 66 | 197,993 | Yes | 29.0 | Yes |
| Gross Realization Rate | | 1.02 | | 1.21 | |
| Verified Gross Savings | | 202,396 | | 35.2 | |
| NTGR | | 0.74 | Yes | 0.74 | Yes |
| Verified Net Savings | | 149,773 | | 26.0 | |
| **Non-Lighting Measures** | | | | | |
| Ex-Ante PY5 Gross Savings | 54 | 64,302 | Yes | 13.2 | No |
| Gross Realization Rate | | 0.92 | | 0.53 | |
| Verified Gross Savings | | 59,128 | | 7.0 | |
| NTGR | | 0.62 | No | 0.62 | No |
| Verified Net Savings | | 36,660 | | 4.3 | |
| **ComEd EPY5 Total** | | | | | |
| Ex-Ante PY5 Gross Savings | 120 | 262,295 | | 42.2 | |
| Realization Rate | | 1.00 | Yes | 1.00 | Yes |
| Verified Gross Savings | | 261,525 | | 42.1 | |
| NTGR | | 0.71 | Yes | 0.72 | Yes |
| Verified Net Savings | | 186,433 | | 30.4 | |

*Source: Evaluation Team analysis.*

Table 4-2 provides the year to year impact results from EPY1 to EPY5 for the Standard program. The program has evolved over time to achieve a higher percentage of ex ante savings from non-lighting measures. The reduction in Standard Program ex ante gross savings in EPY5 should be considered in the context of the overall Smart Ideas for Your Business strategy that applies several programs to meet customer needs and ComEd goals. Several measures that were formerly in the Standard program were moved into the growing Business Instant Lighting Discount (BILD) program, and the Small Business Energy Savings program that launched in EPY4 will also draw off potential Standard program participants in the future.

**Table 4-2. Standard Program Volumetric Results from EPY1-EPY5**

| Program Result | EPY1 | EPY2 | EPY3 | EPY4 | EPY5 | Total |
|---|---|---|---|---|---|---|
| Ex Ante Gross MWh | 90,571 | 213,522 | 258,386 | 333,031 | 262,295 | 1,157,805 |
| Ex Post Gross MWh | 120,550 | 259,093 | 260,237 | 316,379 | 261,525 | 1,217,784 |
| Realization Rate (MWh) | 1.33 | 1.21 | 1.01 | 0.95 | 1.00 | 1.05 |
| Ex Post Net MWh | 80,932 | 191,896 | 188,463 | 234,120 | 186,433 | 881,854 |
| Net-to-Gross Ratio | 0.67 | 0.74 | 0.72 | 0.74 | 0.71 | 0.72 |
| Number of Projects | 455 | 1,739 | 3,794 | 4,603 | 3,544 | 14,134 |
| Percent of Ex Ante Gross Energy Savings from Lighting | 92% | 94% | 85% | 84% | 75% | 85% |

*Source: Evaluation Team analysis.*

# 5. Process Evaluation

## 5.1 Process Evaluation Results

### 5.1.1 Overview and Summary

The program-specific process evaluation for the Standard program in EPY5 included in-depth interviews with program managers at ComEd and KEMA, along with a participant survey that included questions to support both the impact and process assessments. The Evaluation team also performed a cross-cutting process evaluation of the Smart Ideas for Your Business program, the suite of business programs that includes the Business Standard program. This section draws on findings from the cross-cutting process evaluation where applicable to the Business Standard program.[16]

This section includes the four key areas explored during the Business Standard process evaluation, including improvements to internal program processes and operations, customer satisfaction, marketing and outreach, and trade ally engagement.

Program participation (number of projects) in the Standard program decreased by 23% from EPY4 to EPY5, commensurate with a 21% drop in ex ante savings over the same period.[17] Program staff note that some trade allies believed the economy to be a factor hurting the participation. The reduction in Standard Program ex ante gross savings in EPY5 should be considered in the context of the overall Smart Ideas for Your Business strategy that applies several programs to meet customer needs and attain ComEd goals. For example, the BILD program may steer some lighting activity away from the Standard program[18], though we did not quantify this. Aside from overall marketing and outreach efforts to increase coordination across Smart Ideas for Your Business Programs, in EPY5 the Standard program implementation and design remained largely the same. Program staff note that various process improvements were made internally and consideration was given to ways to improve program-specific marketing and outreach in EPY6.

### 5.1.2 General Improvements to Program Processes and Operations

In EPY5, program staff completed an assessment of its internal application review process and made changes to improve incentive processing times and better forecast the number of real projects in the pipeline. According to both ComEd and KEMA staff, these changes have been successful in improving internal program effectiveness.

In EPY5, the program performed an analysis of customer groupings and potential for uncaptured energy savings. Program staff notes that one of the key challenges in EPY5 was the ability to maintain customer and trade ally excitement for program offerings over time. Program staff notes that they plan to place additional emphasis on outreach and targeted marketing to hospitals and large healthcare, data centers, commercial real estate, car dealerships, and grocery stores in EPY6. Data collected through ComEd's customer relationship management system will be utilized as available.

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[16] Please see the ComEd Business Cross-Cutting Evaluation for additional details.
[17] A breakout of program participation over time by industry type and end-use is included in Appendix 0.
[18] In EPY5, the BILD program expanded its offerings to include linear fluorescent lamps.

In EPY5, Energy Orbit[19] was introduced and intended to help outreach staff between the different program implementation teams coordinate their activities. As a part of the cross-cutting research, the Evaluation team spoke with implementers across the different programs, including the Standard program. While respondents reported that they used Energy Orbit as the primary way of sharing leads regarding potential projects, a third (35%) of implementation contractors reported preferring to track and share leads through other means, such as email, telephone or their own systems. In terms of usability, most implementers report having no problems in using Energy Orbit, aside from the initial learning curve. ComEd is working with program implementers to determine how to make the best use of Energy Orbit, and continues to make refinements to the system.

The program put standardized execution metrics into place for processing times. For example, a target of 40 applications must be processed per week. Engineers generally must perform 30 reviews per week, but also have a metric for average number of kilowatt hours, as a small number of larger projects may have higher savings than a large number of small projects. Calculation sheets were also standardized so there was more consistency across-the-board in engineering reviews and fewer exceptions made.

The program implemented a three-touch escalation process for pre-applications, project reservations, and final applications. The first escalation is triggered if administrative staff discover that necessary pieces of information or paperwork are missing from the application, preventing it from moving forward. Staff will then reach out to the applicant and request the additional information. If the information is not provided by a specified date, the second point of escalation is triggered and staff will again reach out to the applicant with increased urgency. If still no response is received from the applicant, the third point of escalation is triggered and the project is cancelled. Program staff note that in certain cases, some projects will begin work again when faced with a cancellation notice.

In addition to the improvements above, program staff also participated in a customer service training course.

### 5.1.3 Participant Satisfaction

In general, 90 percent of the participants surveyed reported being satisfied with the program overall. While still high, this is slightly lower than participant satisfaction in EPY4, which was 96 percent. Most participants (82%) reported being satisfied with the incentive amount, while 87 percent reported being satisfied with the communications with Smart Ideas staff. The mean satisfaction score for ComEd overall was 7.8 on a 0-10 scale, while the mean satisfaction score for the Smart Ideas Program overall was 8.5. Both of these mean satisfaction numbers were higher than those reported from cross-cutting participants[20], which were 7.4 for ComEd overall, and 7.9 for the Smart Ideas Program, respectively.

A clear majority (79%) of respondents plan to participate in ComEd's Smart Ideas for Your Business Program again in the future, slightly more than the 73 percent of cross-cutting respondents who plan

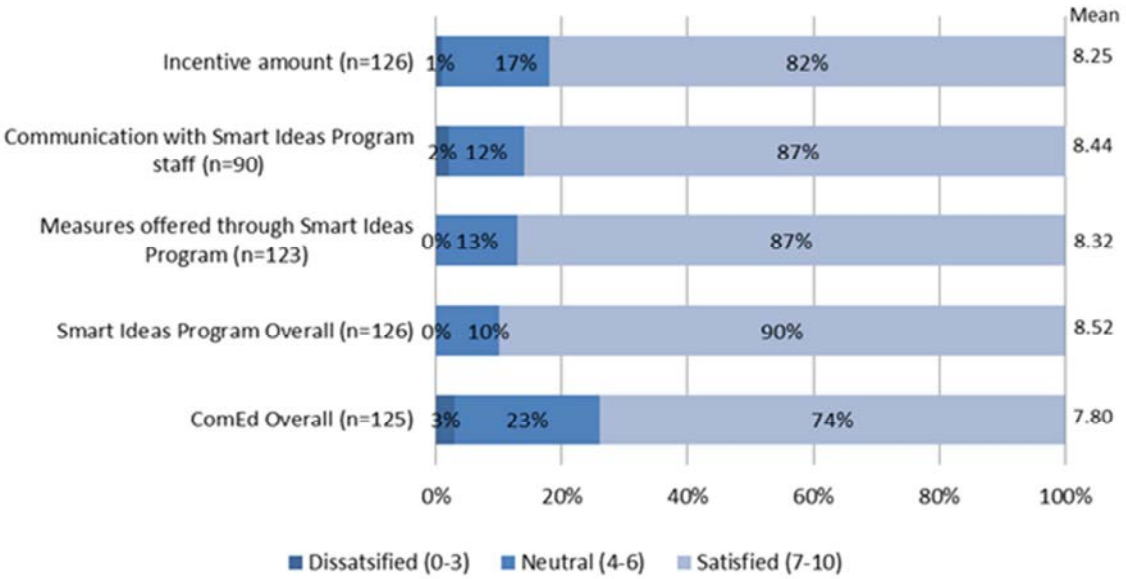
[19] Energy Orbit is further discussed in the Cross-Cutting evaluation research.

[20] Please note that the Cross-Cutting survey efforts included participants across all Smart Ideas for Your Business Program offerings, not just the Standard program offering.

on participating in the Smart Ideas Program in the future. Twenty percent of respondents who offered a recommendation to improve the program called for higher incentives for program measures. Most respondents, however, did not offer recommendations to improve the program.

Our interviews with ComEd and KEMA staff indicated that participants were satisfied with the program overall. This is consistent with our results from the evaluation survey in September and October 2013, in which we spoke with 127 customers who installed qualifying measures under the Standard program. Participant satisfaction with various elements of the Business Standard program elements is reported in Figure 5-1 below.

**Figure 5-1. Participant Satisfaction with Program Elements**




*Source: Evaluation Team Participant survey, September-October 2013*

Respondents most often noted the potential for energy savings (62%) followed by the opportunity for a rebate or incentive (28%) as the primary benefits of participating in the program. On the whole, respondents typically (69%) claimed that the program presents no drawbacks to participation. Of those participants who identified barriers to participation, the most frequent concern (13%) was paperwork being too burdensome. Despite this concern, most (94%) respondents who completed their own application forms indicated that the application clearly explained the program requirements. On average, respondents felt that the application process was easy, rating it as an 8.1 on a 0-10 scale. This is slightly higher than EPY4, in which participants rated the application process as 7.7 on a 0-10 scale.

Few (17%) participants reported contacting the Smart Ideas for Your Business Call Center during their project. Of those respondents who contacted the call center, the majority (84%) were satisfied with the Call Center's ability to answer program-related questions. These numbers closely reflect the results for corresponding questions from the cross-cutting evaluation.

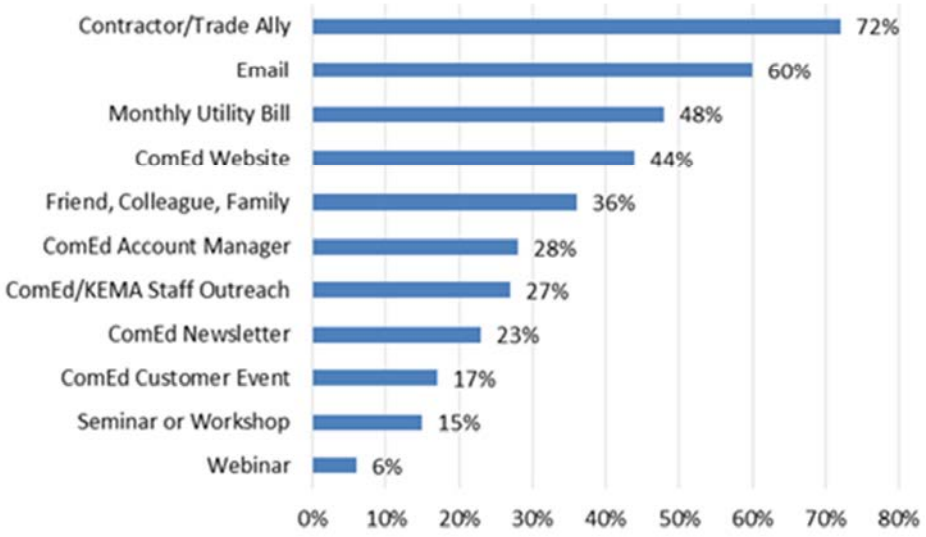
### 5.1.4 Marketing and Outreach

In EPY5, ComEd continued its overall portfolio marketing approach of presenting a unified "face" to customers in the marketplace, while increasing efforts to coordinate between program elements behind-the-scenes. Program-specific outreach efforts for the Standard program remained largely the same as efforts in EPY4, though staff began making some refinements in EPY5 and planned for additional changes in EPY6.

Standard program-specific marketing strategies included leveraging relationships with trade allies, following leads from account managers and customers completing Smart Ideas Opportunity Assessments (SIOAs), bonus promotions, fact sheets and case studies, the program website, and e-newsletters.

As shown in Figure 5-2, most EPY5 participants learned about ComEd's Smart Ideas for Your Business Program through a discussion with a contractor or a trade ally (72%), followed by e-mails (60%), monthly utility bill (48%), ComEd website (44%), or through a colleague, friend, or family member (36%). Other sources of program awareness include a ComEd Account Manager (28%) ComEd or KEMA staff (27%), ComEd newsletters (23%), a ComEd-hosted customer event (17%), a meeting, seminar, or workshop hosted by a third-party (15%), or a webinar (6%).

**Figure 5-2: Sources of Program Awareness**



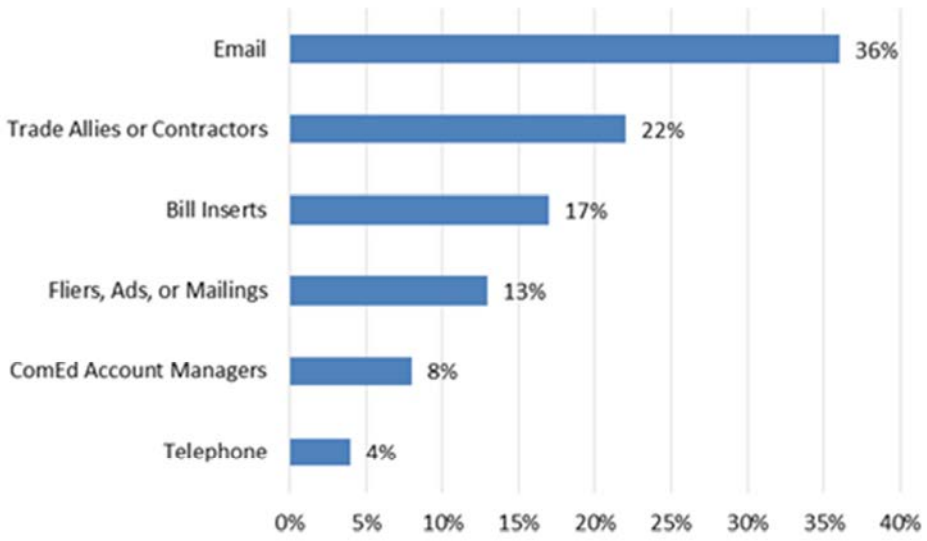

*Source: Evaluation Team Participant survey, September-October 2013*

Most program participants found the program's marketing materials to be either very useful (36%) or somewhat useful (53%). Only a handful of participants found the program's marketing materials to be not very useful (3%) or not at all useful (8%). While most customers feel that the marketing materials are at least somewhat useful, the program may still want to review its current materials and obtain customer feedback to determine how it can increase their usefulness to the customer.

Participants said that email (36%) was the best way to reach companies like theirs to provide information on energy efficiency opportunities such as the Smart Ideas for Your Business Program.

They also suggested passing information on through bill inserts (17%) fliers, ads, or mailings (13%), and ComEd's Account Managers (8%). Interestingly, although 72% of participants said they had seen or heard information about the program from a trade ally or contractor, only (22%) of participants said they would prefer to receive information via trade allies or contractors. Full results for this question can be found in Figure 5-3 below.

**Figure 5-3: How Standard Participants Prefer to Hear About Program**




*Source: Evaluation Team Participant survey, September-October 2013*

In pursuing these targeted marketing efforts, program staff should confirm that they are adequately coordinating with other program implementers and other program elements (such as the Segmented Programs) to maintain a unified front to the customer and to ensure that efforts are not being duplicated elsewhere.

### 5.1.5 Trade Allies

The evaluation team did not interview participating trade allies for the Standard program-specific process evaluation work this year. However, the evaluation team did interview 60 trade allies as a part of the cross-cutting evaluation. This section includes key findings from the cross-cutting trade ally interviews and program-specific findings for the Standard program.

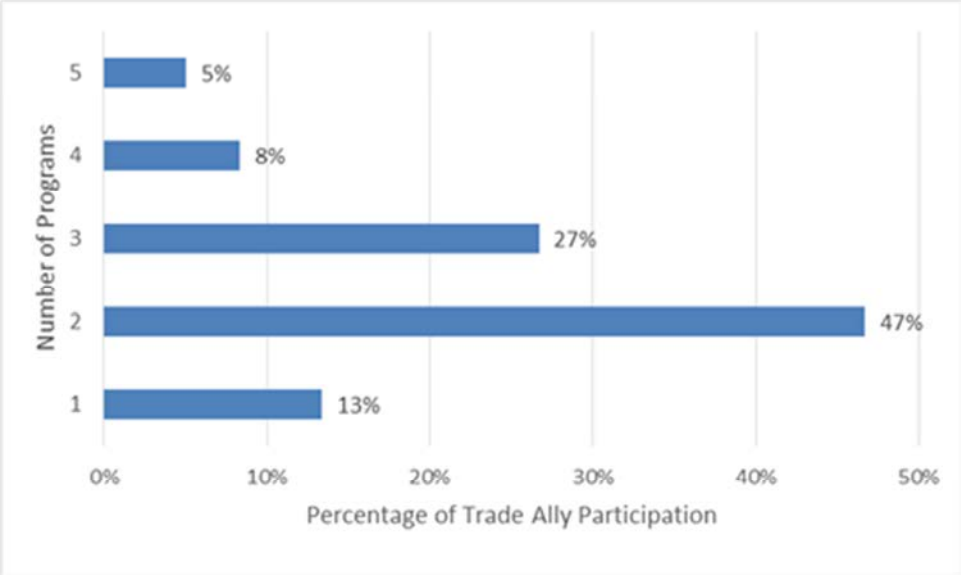
#### *5.1.5.1 Cross-Cutting Trade Ally Survey Highlights*

When talking to their customers about Smart Ideas program elements, trade allies reported being most knowledgeable about the Standard program (8.2 mean on a 0-10 scale) compared to other program elements, which ranged from a mean of 7.6 for Business Instant Lighting Discounts to a mean of 4.2 for the Multi-Family Comprehensive Energy Efficiency program. Only a third (37%) of the trade allies interviewed reported that their customers are aware of ComEd energy efficiency programs overall. When asked about specific Smart Ideas program elements, trade allies reported

customer awareness highest in the Standard (6.0 mean) and Business Instant Lighting Discounts (5.9 mean) programs.[21]

Trade allies report participating in multiple program elements, with half participating in two or more programs, and 40% participating in three or more, as shown in Figure 5-4. This trend towards cross-participation highlights the importance of continuing increased coordination across Smart Ideas for Your Business Program elements.

**Figure 5-4: Count of Programs in Which Trade Allies Participate**



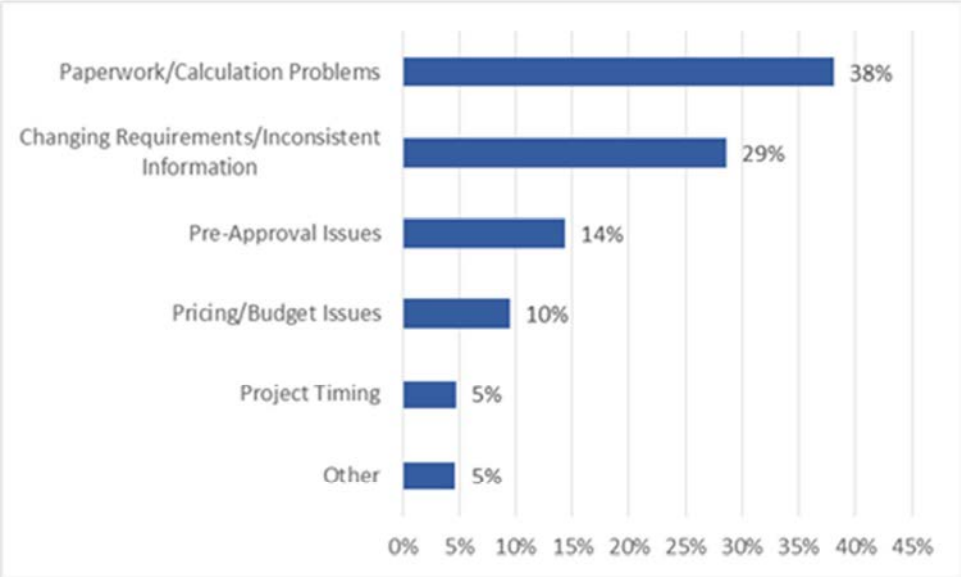

*Source: Evaluation Research Cross-Cutting Trade Ally Interviews*

Trade ally respondents reported few problems with the Smart Ideas for Your Business portfolio on the whole. The trade allies interviewed rated the ease of becoming a Smart Ideas trade ally, getting notifications about program changes, and knowing how to contact with a question as 8.5 on average,[22] respectively. Trade allies found it somewhat less easy to apply for incentives (7.8 mean) and prepare the paperwork needed to get an incentive (7.6 mean); however, these ratings still indicate ease in completing these tasks within the program.

About a third (37%) of the trade allies interviewed reported experiencing problems in completing projects through the Smart Ideas program. Figure 5-5 shows the various problems that trade allies report encountering.

[21] On a 0 to 10 scale, with 0 being "not at all aware" and 10 being "extremely aware."
[22] On a scale of 0 to 10, with 0 being "very difficult" and 10 being "very easy."

**Figure 5-5: Problems Experienced by Trade Allies**




As most participants (72%) reported hearing about the Standard program through a contractor or trade ally, the program should work closely with its trade allies to reduce the number of potential bottlenecks in the participation process.

Additional findings related to trade allies and their perceptions of the Smart Ideas programs overall can be found in the Business Cross-Cutting Evaluation Report.

#### *5.1.5.2 Trade Ally Engagement*

Program staff noted that in EPY5 they worked to continue to maintain a robust trade ally network and to reach further upstream in trade allies' sales processes with clients so the program is introduced earlier in the project lifecycle. As a part of this effort, KEMA met with various trade allies to get a sense of their project pipeline and to discuss how they could assist trade allies in promoting energy efficiency to their clients.

Like EPY4, in EPY5 the program offered a Trade Ally Performance Reward Program. To be eligible for the rewards program, trade allies must meet the following requirements:

- Be a trade ally in good standing with the program
- Have completed projects in EPY4 with kWh savings of 1.0 million or more
- Submit a completed reward program enrollment application

The bonus structure in EPY5 is somewhat different than the structure in EPY4, which included two tiers of performance, platinum and gold. Under the EPY4 structure, trade allies that achieved platinum status brought in projects with savings of 25% to 50% over what was brought in from the previous year, and received rewards of 4% to 8% of the dollar amount of paid incentives at goal. Gold status was met if a trade ally completed projects with at least 2.5 million kWh or 5.0 million kWh of savings, and included bonus rewards of $7,500 and $15,000, respectively. Comparatively, the EPY5 bonus structure establishes the performance goal by simply setting a 20% increase over project

savings achieved in EPY4, eliminating the two levels of gold and platinum. A cash reward is still paid to those trade allies who meet the goal, which equals 2% of the difference between the goal and projects paid in the previous year.

Program records indicate that in EPY5, 63 trade allies enrolled in the Performance Reward Program. This is slightly lower than participation in EPY4, which enrolled 73 trade allies. Combined, these trade allies brought in more than 183 million kWh, which is approximately 56% less than the combined trade ally planning estimate of 286 million kWh for EPY5. Of the 63 trade allies in the Performance Reward Program, 13 exceeded their performance in EPY4 and 11 of these trade allies met their performance goal. The remaining 50 trade allies fell below their EPY4 performance levels. Of trade allies receiving a reward, four also received performance rewards in EPY4 at the gold level; however no trade allies that achieved platinum status in EPY4 received rewards in EPY5.

Program staff notes that they plan to make further adjustments to the Trade Ally Performance Reward Program structure in EPY6, and will continue to work closely with participating trade allies to gain more transparency in expected project pipelines and to get higher upstream in the project planning process.

## 6. Conclusions and Recommendations

This section summarizes the key impact and process findings and recommendations.

The Standard Program in EPY5 achieved overall verified gross savings of 261,525 MWh, and verified net energy savings of 186,433 MWh. The verified gross savings for lighting end-use measures is 202,396 MWh at a gross realization rate of 1.02. The verified gross savings for non-lighting measures is 59,128 MWh at a gross realization rate of 0.92. Balancing lighting and non-lighting results, ComEd achieved an overall savings verification realization rate of 1.00 on energy savings. The NTG values used to calculate EPY5 verified net savings were deemed through a consensus process by the Illinois Stakeholder Advisory Group (SAG)[23] based on EPY3 evaluation research. The deemed lighting NTGR value of 0.74 was statistically significant at the 90/10 level, but the non-lighting NTGR value from EPY3 of 0.62 did not meet the 90/10 criteria. The evaluation team conducted research on gross impacts, free-ridership and spillover in EPY5.

Participating customers were generally satisfied with the Standard program – 90 percent of the customers surveyed reported being satisfied with the program overall. The mean satisfaction score for the Smart Ideas Program overall was 8.5 on a 0-10 scale. A clear majority (79%) reported planning to participate in ComEd's Smart Ideas for Your Business Program again in the future.

**Program Participation**

**Finding 1.** Program participation (number of projects) in the Standard program decreased by 23% from EPY4 to EPY5, commensurate with a 21% drop in ex ante energy savings over the same period. Ex ante non-lighting energy savings grew from 53,799 in EPY4 to 64,302 MWh in EPY5, a 20% increase. The non-lighting increase is a commendable result, given the complexity and breadth of measures involved. The ex ante lighting energy savings dropped from 279,231 MWh in EPY4 to 197,993 MWh in EPY5, a drop of 81,238 MWh (29%). The reduction in Standard program activity should be viewed in the context of ComEd's overall business strategy. Several lighting measures that were formerly in the Standard program were moved into the growing Business Instant Lighting Discount (BILD) program for EPY5, and the Small Business Energy Savings program that launched in EPY4 will also draw potential Standard program participants. The T12 market appears to be dwindling for the program.

**Recommendation 1.** To maintain or grow the Standard program as the T12 market phases out, ComEd should continue to pursue the strategy of targeting marketing efforts to specific measures, channels, and messages. ComEd should consider ongoing assessment of program results and trends on an end-use basis, potentially even at the measure level for key measures, to determine which are underperforming against savings potential and which are growing. A custom strategy could be developed for key measures, by business segment, and phase of technology adoption. ComEd should consider refining and

[23] Document provided by ComEd to the SAG summarizing the SAG-approved NTGR for ComEd for EPY5-EPY6 as negotiated in March-August 2013. Distributed in the SAG meeting on August 5-6, 2013. http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls

delivering multiple marketing messages and delivery approaches to trigger different decision-makers to act. Attracting future customer participants for T12 retrofits may need a tailored set of sales messages and reasons for participating that resonate with these late adopting customers.

**Gross Realization Rates**

**Finding 2.** Although the energy and peak demand savings verification realization rates were 1.00 for the overall program, there were upward gross adjustments on lighting that balanced out downward savings adjustments on non-lighting measures. As the program emphasis on non-lighting measures increases, the Standard program overall could face increasing risk of downward evaluation adjustment. The program tracking ex ante estimates of lighting gross energy savings are conservative overall, but savings for non-lighting measures have inconsistent realization rate results across end-use and measures types, and evaluation adjustments were both higher and lower.

**Recommendation 2a.** The measure level findings identified in this report merit follow-up by ComEd and the Illinois TRM process. ComEd may want to consider adding an additional testing process after each update to the tracking system. The testing process could be prioritized to "high priority" and "low priority" measures, and include a demonstrative report-out in a group setting for high priority measures.

**Recommendation 2b.** Deemed and non-deemed non-lighting measures should be the emphasis for improving ex ante savings estimates. Among non-deemed measures, energy management control systems are the highest priority for further research. The Illinois TRM needs revisions to the Guest Room Energy Management measure, which has an error in the example calculation for peak demand savings, and evaluation research suggests the Illinois TRM may be overstating energy savings.

**Recommendation 2c.** ComEd should consider enhancing the pre- and post-installation verification approach on large chiller and variable speed drive projects to ensure eligibility.

**Finding 3.** ComEd's implementation of the TRM into their tracking system sometimes uses averaging of TRM assumptions that reduce the amount of data to be collected from the participant, but it is not clear whether ComEd intends ex ante measure savings should be considered deemed, partially deemed, or custom. Certain data, such as whether a lighting measure is installed in cooled or uncooled space, does not appear to be factored into the ex ante savings determination.

**Recommendation 3.** A detailed spreadsheet tool that can document each assumption for each TRM measure, such as the tool discussed in the December 3, 2013 TRM Technical Advisory Committee meeting, may provide a common Illinois approach for ComEd to communicate its claims on deeming status of measures.

**Net-to-Gross estimates**

**Finding 4.** The SAG process deemed separate NTG values for lighting and non-lighting savings in EPY5. The EPY5 free-ridership estimate used to calculate the NTGR was deemed by the Illinois Stakeholder Advisory Group (SAG) based on EPY3 evaluation research. Evaluation research in EPY3 examined only participant spillover, and assigned a value of zero based on participant survey responses. The deemed NTG for non-lighting energy savings of 0.62 with a relative precision of ± 30% and 90% level of confidence,

while the deemed lighting NTG was 0.74 at a relative precision of ± 5% and 90% level of confidence. Evaluation research of NTG (free-ridership only) conducted on EPY5 participants found a value of 0.74 for lighting (90/5) and 0.69 for non-lighting (90/8). Evaluation research findings for spillover in EPY5 were estimated at 0.05 for lighting, and 0.06 for non-lighting savings.

**Recommendation 4.** The EPY5 research findings for NTG ratios for lighting (0.79, with spillover added) and non-lighting (0.75 with spillover) should be considered for future deeming. The non-lighting NTG ratios estimated prior to EPY5 were not significant at the 90/10 level.

**Participant Satisfaction.**

**Finding 5.** Standard program participants are generally very satisfied with the program and with ComEd. The mean satisfaction score for ComEd overall was 7.8 on a 0-10 scale, while the mean satisfaction score for the Smart Ideas Program overall was 8.5. Additionally, a clear majority (79%) reported planning to participate in ComEd's Smart Ideas for Your Business Program again in the future.

**Program Participation and Marketing.**

**Finding 6.** Despite high satisfaction ratings, project participation in the Standard program decreased by 23% from EPY4 to EPY5, although that is in the context of a comprehensive business strategy with multiple program offerings. Program staff note that some trade allies asserted the economic recovery as a factor affecting participation, and staff also remarked that one of the key challenges in EPY5 was the ability to maintain customer and trade ally excitement for program offerings over time. As a part of an assessment of marketing strategies in EPY5, program staff identified several key market areas to target in EPY6 to increase participation.

**Recommendation 6a.** Program staff should coordinate closely with other Smart Ideas for Your Business Program elements, such as Business Instant Lighting Discounts (BILD), Custom, Small Business Energy Savings, Industrial Systems, and others that are relevant to the targeted market areas to review individual measures and channels that may be more effectively delivered through the Standard program. As noted in the Cross-Cutting Evaluation Report, trade allies and end-use customers may need to work with multiple program elements to meet their energy efficiency needs and should see the portfolio as a comprehensive solution. Efforts to increase coordination should streamline participation and remove barriers.

**Recommendation 6b.** A majority of Standard participants (72%) report hearing about the program through a contractor or trade ally. As the trade ally network is the key to reaching most participants, the program should work to effectively reach trade allies about program offerings, market segments, and measures especially where energy savings is lagging relative to potential. These efforts should be coordinated with other programs, as our Cross-Cutting research found that most trade allies work across multiple programs. The program should also have an eye towards reducing barriers that may prohibit trade allies from participating, such as paperwork issues, pre-approval issues, or understanding changing requirements.

**Trade Ally Rewards.**

**Finding 7a.** Of 63 trade allies participating in the EPY5 Trade Ally Performance Rewards Program, 11 achieved the performance reward goal of increasing achievement by 20% over the previous year. However, the remaining majority of trade allies significantly underperformed compared to the previous year, with all but two bringing in a lower level of savings than EPY4. Program staff report that in EPY5 they worked more closely with trade allies to increase transparency related to the projects in the pipeline, and to determine how they could assist trade allies in promoting energy efficiency to their clients.

**Finding 7b.** A flat percentage increase goal, such as the 20% that was established in EPY5, has advantages because it allows for transparency to outside parties in how the goals are set. However, it does not take into consideration the specific circumstances of each trade ally or projects already in the pipeline, along with other factors outside of the trade ally's control, such as the economy.

**Recommendation 7.** The program should continue efforts in EPY6 to assist trade allies with pipeline projects, and consider ways to revise the rewards structure to address specific factors affecting trade ally performance. Further process research should be performed to test trade ally awareness and understanding of the bonus, motivations, and to inform the development of the appropriate goal setting and reward value. In-depth interviews could be performed to determine additional ways in which the program's relationship with trade allies could be leveraged to increase program participation.

# 7. Appendix

## 7.1 ComEd, Nicor, Peoples Gas, and North Shore Gas EM&V Reporting Glossary. December 17, 2013

# High Level Concepts

**Program Year**

- EPY1, EPY2, etc. Electric Program Year where EPY1 is June 1, 2008 through May 31, 2009, EPY2 is June 1, 2009 through May 31, 2010, etc.
- GPY1, GPY2, etc. Gas Program Year where GPY1 is June 1, 2011 through May 31, 2012, GPY2 is June 1, 2012 through May 31, 2013.

There are two main tracks for reporting impact evaluation results, called Verified Savings and Impact Evaluation Research Findings.

**Verified Savings composed of**

- Verified Gross Energy Savings
- Verified Gross Demand Savings
- Verified Net Energy Savings
- Verified Net Demand Savings

These are savings using deemed savings parameters when available and after evaluation adjustments to those parameters that are subject to retrospective adjustment for the purposes of measuring savings that will be compared to the utility's goals. Parameters that are subject to retrospective adjustment will vary by program but typically will include the quantity of measures installed. In EPY5/GPY2 the Illinois TRM was in effect and was the source of most deemed parameters. Some of ComEd's deemed parameters were defined in its filing with the ICC but the TRM takes precedence when parameters were in both documents.

**Application:** When a program has deemed parameters then the Verified Savings are to be placed in the body of the report. When it does not (e.g., Business Custom, Retrocommissioning), the evaluated impact results will be the Impact Evaluation Research Findings.

**Impact Evaluation Research Findings composed of**

- Research Findings Gross Energy Savings
- Research Findings Gross Demand Savings
- Research Findings Net Energy Savings
- Research Findings Net Demand Savings

These are savings reflecting evaluation adjustments to any of the savings parameters (when supported by research) regardless of whether the parameter is deemed for the verified savings analysis. Parameters that are adjusted will vary by program and depend on the specifics of the research that was performed during the evaluation effort.

**Application:** When a program has deemed parameters then the Impact Evaluation Research Findings are to be placed in an appendix. That Appendix (or group of appendices) should be labeled Impact Evaluation Research Findings and designated as "ER" for short. When a program does not have deemed parameters (e.g., Business Custom, Retrocommissioning), the Research Findings are to be in

the body of the report as the only impact findings. (However, impact findings may be summarized in the body of the report and more detailed findings put in an appendix to make the body of the report more concise.)

## Program-Level Savings Estimates Terms

| N | Term Category | Term to Be Used in Reports‡ | Application† | Definition | Otherwise Known As (terms formerly used for this concept)§ |
|---|---|---|---|---|---|
| 1 | Gross Savings | Ex-ante gross savings | Verification and Research | Savings as recorded by the program tracking system, unadjusted by realization rates, free ridership, or spillover. | Tracking system gross |
| 2 | Gross Savings | Verified gross savings | Verification | Gross program savings after applying adjustments based on evaluation findings for only those items subject to verification review for the Verification Savings analysis | Ex post gross, Evaluation adjusted gross |
| 3 | Gross Savings | Verified gross realization rate | Verification | Verified gross / tracking system gross | Realization rate |
| 4 | Gross Savings | Research Findings gross savings | Research | Gross program savings after applying adjustments based on all evaluation findings | Evaluation-adjusted ex post gross savings |
| 5 | Gross Savings | Research Findings gross realization rate | Research | Research findings gross / ex-ante gross | Realization rate |
| 6 | Gross Savings | Evaluation-Adjusted gross savings | Non-Deemed | Gross program savings after applying adjustments based on all evaluation findings | Evaluation-adjusted ex post gross savings |
| 7 | Gross Savings | Gross realization rate | Non-Deemed | Evaluation-Adjusted gross / ex-ante gross | Realization rate |
| 1 | Net Savings | Net-to-Gross Ratio (NTGR) | Verification and Research | 1 – Free Ridership + Spillover | NTG, Attribution |
| 2 | Net Savings | Verified net savings | Verification | Verified gross savings times NTGR | Ex post net |
| 3 | Net Savings | Research Findings net savings | Research | Research findings gross savings times research NTGR | Ex post net |
| 4 | Net Savings | Evaluation Net Savings | Non-Deemed | Evaluation-Adjusted gross savings times NTGR | Ex post net |
| 5 | Net Savings | Ex-ante net savings | Verification and Research | Savings as recorded by the program tracking system, after adjusting for realization rates, free ridership, or spillover and any other factors the program may choose to use. | Program-reported net savings |

‡ "Energy" and "Demand" may be inserted in the phrase to differentiate between energy (kWh, Therms) and demand (kW) savings.

† **Verification** = Verified Savings; **Research** = Impact Evaluation Research Findings; **Non-Deemed** = impact findings for programs without deemed parameters. We anticipate that any one report will either have the first two terms or the third term, but never all three.

§ Terms in this column are not mutually exclusive and thus can cause confusion. As a result, they should not be used in the reports (unless they appear in the "Terms to be Used in Reports" column).

## Individual Values and Subscript Nomenclature

The calculations that compose the larger categories defined above are typically composed of individual parameter values and savings calculation results. Definitions for use in those components, particularly within tables, are as follows:

**Deemed Value** – a value that has been assumed to be representative of the average condition of an input parameter and documented in the Illinois TRM or ComEd's approved deemed values. Values that are based upon a deemed measure shall use the superscript "D" (e.g., delta watts$^{D}$, HOU-Residential$^{D}$).

**Non-Deemed Value** – a value that has not been assumed to be representative of the average condition of an input parameter and has not been documented in the Illinois TRM or ComEd's approved deemed values. Values that are based upon a non-deemed, researched measure or value shall use the superscript "E" for "evaluated" (e.g., delta watts$^{E}$, HOU-Residential$^{E}$).

**Default Value** – when an input to a prescriptive saving algorithm may take on a range of values, an average value may be provided as well. This value is considered the default input to the algorithm, and should be used when the other alternatives listed for the measure are not applicable. This is designated with the superscript "DV" as in $X^{DV}$ (meaning "Default Value").

**Adjusted Value** – when a deemed value is available and the utility uses some other value and the evaluation subsequently adjusts this value. This is designated with the superscript "AV" as in $X^{AV}$

## Glossary Incorporated From the TRM

Below is the full Glossary section from the TRM Policy Document as of October 31, 2012[24].

**Evaluation:** Evaluation is an applied inquiry process for collecting and synthesizing evidence that culminates in conclusions about the state of affairs, accomplishments, value, merit, worth, significance, or quality of a program, product, person, policy, proposal, or plan. Impact evaluation in the energy efficiency arena is an investigation process to determine energy or demand impacts achieved through the program activities, encompassing, but not limited to: *savings verification*, *measure level research*, and *program level research*. Additionally, evaluation may occur outside of the bounds of this TRM structure to assess the design and implementation of the program.

*Synonym*: **Evaluation, Measurement and Verification (EM&V)**

> **Measure Level Research**: An evaluation process that takes a deeper look into measure level savings achieved through program activities driven by the goal of providing Illinois-specific

[24] IL-TRM_Policy_Document_10-31-12_Final.docx

research to facilitate updating measure specific TRM input values or algorithms. The focus of this process will primarily be driven by measures with high savings within Program Administrator portfolios, measures with high uncertainty in TRM input values or algorithms (typically informed by previous savings verification activities or program level research), or measures where the TRM is lacking Illinois-specific, current or relevant data.

**Program Level Research**: An evaluation process that takes an alternate look into achieved program level savings across multiple measures. This type of research may or may not be specific enough to inform future TRM updates because it is done at the program level rather than measure level. An example of such research would be a program billing analysis.

**Savings Verification**: An evaluation process that independently verifies program savings achieved through prescriptive measures. This process verifies that the TRM was applied correctly and consistently by the program being investigated, that the measure level inputs to the algorithm were correct, and that the quantity of measures claimed through the program are correct and in place and operating. The results of savings verification may be expressed as a program savings realization rate (verified ex post savings / ex ante savings). Savings verification may also result in recommendations for further evaluation research and/or field (metering) studies to increase the accuracy of the TRM savings estimate going forward.

**Measure Type:** Measures are categorized into two subcategories: custom and prescriptive.

**Custom:** Custom measures are not covered by the TRM and a Program Administrator's savings estimates are subject to retrospective evaluation risk (retroactive adjustments to savings based on evaluation findings). Custom measures refer to undefined measures that are site specific and not offered through energy efficiency programs in a prescriptive way with standardized rebates. Custom measures are often processed through a Program Administrator's business custom energy efficiency program. Because any efficiency technology can apply, savings calculations are generally dependent on site-specific conditions.

**Prescriptive:** The TRM is intended to define all prescriptive measures. Prescriptive measures refer to measures offered through a standard offering within programs. The TRM establishes energy savings algorithm and inputs that are defined within the TRM and may not be changed by the Program Administrator, except as indicated within the TRM. Two main subcategories of prescriptive measures included in the TRM:

**Fully Deemed:** Measures whose savings are expressed on a per unit basis in the TRM and are not subject to change or choice by the Program Administrator.

**Partially Deemed:** Measures whose energy savings algorithms are deemed in the TRM, with input values that may be selected to some degree by the Program Administrator, typically based on a customer-specific input.

In addition, a third category is allowed as a deviation from the prescriptive TRM in certain circumstances, as indicated in Section 3.2:

**Customized basis:** Measures where a prescriptive algorithm exists in the TRM but a Program Administrator chooses to use a customized basis in lieu of the partially or fully deemed inputs. These measures reflect more customized, site-specific calculations (e.g., through a simulation model) to estimate savings, consistent with Section 3.2.

## 7.2 Detailed Impact Research Findings and Approaches

### 7.2.1 Gross Impact Results

The gross impact evaluation results presented in Section 3 differentiated between savings verification of deemed measures and input values and site-specific engineering research estimates of non-deemed measure savings. Savings verification sought to verify eligibility, quantity, and compliance with claimed deemed per unit savings values defined in the Illinois TRM. Gross impact evaluation of non-deemed measures involved collecting data from supporting project documentation and on-site measurement and verification (M&V) to estimate site-specific measure savings for custom variables. This Section provides evaluation research impact findings for all sampled measure evaluated on a custom basis, without applying the Illinois TRM.

The ex-ante gross savings reported in ComEd's tracking system were evaluated using the following steps:

1. Engineering review at the measure-level for a sample of 120 project files, with the following subcomponents:
    - Implemented a stratified random sampling design of lighting and non-lighting measures to select 120 projects (consisting of 66 lighting and 54 non-lighting projects) from the population of 3,544 Standard project applications and 7,137 Standard measures. Sampling was done in two waves with three sub-strata based on size. Sample sizes were designed provide a 90/10 confidence/relative precision level for program-level savings separately for lighting and non-lighting gross savings verification.
    - Conducted on-site visits and measurement and verification (M&V) activities on a sample of 42 Standard projects (17 lighting and 25 non-lighting) selected from the 120 projects to support a research estimate of measure gross savings. Lighting projects selected for on-site verification tended to be very large or complex projects. The selection of non-lighting projects for on-site verification was driven by project size and the need to site-verify measures with higher savings uncertainty. On-site data collection occurred primarily during the June 1 through August 31 summer peak period. Performance measurements included spot measurements and run-time hour data logging for selected measures.
    - Conducted an engineering review of project files and energy savings estimates on the remaining 78 projects from the sample of 120 projects to support a research estimate of gross measure savings.
    - Calculation of a research estimate of gross savings value (kWh and kW) for each project within the sample, based on measure-level engineering analysis.
2. Carry out a quality control review of the research findings impact estimates and the associated draft site reports and implement any necessary revisions.

A research findings gross realization rate (which is the ratio of the research findings gross savings to ex-ante gross savings as reported in the tracking system) was then estimated for the sample and

applied to the total program ex-ante gross savings, using sampling-based approaches that are described in greater detail below. The result is an evaluation research findings estimate of gross savings for the Standard Program.

**Sampling Design (Savings Verification and Research Estimate)**
The sample draw for onsite M&V was designed to provide a 90/10 level confidence and relative precision for gross impact realization rate results for lighting measures, non-lighting measures, and the overall program. Analysis and reporting isolated results by building type, although sampling was not designed to provide a 90/10 level of confidence and relative precision by building type.

From EPY1 through EPY4, our sample design stratified by project size to efficiently distribute the sample and improves precision on program-level savings. In EPY5, the sample design considered multiple factors:

1. Program-level gross and net savings verification reporting in detail to ICC staff and the ComEd program team.
2. Supporting updates to the TRM through on-site data collection.
3. Results from EPY4 and earlier observed differences between lighting and non-lighting gross savings realization rates and net-to-gross ratios.
4. Deemed measures and non-deemed measures have different M&V requirements. Savings for deemed measures are dominated by lighting, while non-deemed measures include all end-uses.
5. Evaluation budgets place limits on the sample size, particularly for on-site M&V which is more costly to conduct.

After considering these five factors and reviewing the EPY5 participation data through March 2013, we concluded that it was necessary to stratify by end-use category as the top-level priority (and provide 90/10 results by end-use category for gross and net savings reporting), and that doing so supported all five design factors above. Stratifying by project size supports the last design factor (evaluation budget limits), so we further stratified our end-use categories by project size. We examined sample designs that stratified by building type, which would be desirable for supporting the first two design factors (detailed reporting and TRM support), however, the sample sizes to achieve 90/10 results by building type were prohibitively large relative to the evaluation budget.

For the EPY5 program year, a statistically significant sample based on 90/10 confidence/precision level for program-level savings was drawn for the gross savings verification. Strata were defined by project size (separately for lighting and non-lighting projects), based on ex-ante gross energy savings boundaries that placed about one-third of program-level savings into each stratum. For lighting projects, Stratum 1 consisted of large projects with project-level ex-ante energy savings greater than 340,000 kWh, stratum 3 consisted of small projects with ex-ante gross energy savings less than 108,700 kWh, and stratum 2 consisted of the medium sized projects in between. Similarly, for non-lighting projects, Stratum 1 consisted of large projects greater than 192,000 kWh, stratum 3 consisted of small projects less than 68,000 kWh, and stratum 2 consisted of the medium sized projects in between.

Sampling was done in two waves that were roughly proportional to the populations they represented. The first wave of sampling was conducted on projects with a status of paid in an April 9,

2013 database extract. The second and final wave of sample projects was drawn from a July 1, 2013 tracking system extract of projects paid after the April 9 extract. The second sampling wave did not sample 319 projects, because 79 of this total were pending payment as at July 1, when the wave 2 sample were taken. The remaining 240 projects were later identified from the Custom Program tracking database with standard measures tracked as custom. The 319 projects account for 6 percent of the total program savings.

To capture the representation of building type distribution, the sample building type distribution was compared against the program population to check if the sample reasonably represents the population distribution. An iterative approach was used to draw a sample until a reasonable representation of building type distribution was captured at the conclusion of wave 2. This approach did not support 90/10 gross impact realization rate results at the business type level, but none-the-less provided useful information for the most prominent building types.

We concluded that this sampling approach provided substantial amounts of M&V research data in support of the TRM. We conducted on-site M&V at 42 sites (24 lighting and 18 non-lighting sites). For lighting, we conducted on-site M&V including lighting logging on about 4 office, 5 industrial, 7 warehouse, 6 miscellaneous, and 2 medical sites. The non-lighting M&V sites will include TRM deemed measures for guest room energy management and variable speed drives.

Table 7-1 below provides a comparison of the population profile to the sample, analyzed by measure technology types for sampled projects that align with end uses. The project count of the sample provides an indication of the end-use distribution of sampled projects due to the weighting approach of sampled projects to develop the population mean for the realization rate. The sample reflects the dominance of lighting.

**Table 7-1. Profile of the EPY5 Population and Gross Savings Verification Sample by End-use Type**

| Population Summary | | | | Sample | | | |
|---|---|---|---|---|---|---|---|
| End Use Type | Number of Project (N) | Ex Ante Claimed Gross Savings, MWh | MWh Weights | Number of Project (n) | Ex Ante MWh | Sample MWh Weights | Sampled kWh % of Population |
| LIGHTING | 2,563 | 197,993 | 75% | 66 | 19,792 | 69% | 10% |
| HVAC EQUIPMENT | 32 | 5,811 | 2% | 6 | 1,715 | 6% | 30% |
| HVAC_VSD | 371 | 29,888 | 11% | 27 | 3,743 | 13% | 13% |
| REFRIG | 320 | 8,959 | 3% | 6 | 644 | 2% | 7% |
| COMP_AIR | 20 | 845 | 0% | 1 | 53 | 0% | 6% |
| IS_VSD | 122 | 10,267 | 4% | 5 | 460 | 2% | 4% |
| OTHER | 116 | 8,532 | 3% | 9 | 2,359 | 8% | 28% |
| **TOTAL** | **3,544** | **262,295** | **100%** | **120** | **28,767** | **100%** | **11%** |

*Source: Utility tracking data and Navigant analysis.*

To capture the representation of building type distribution, the sample building type distribution was compared against the program population to check if the sample reasonably represents the

population distribution. An iterative approach was used to draw a sample until a reasonable representation of building type distribution was captured at the conclusion of wave 2. This approach did not support 90/10 gross impact realization rate results at the business type level, but none-the-less provided useful information for the most prominent building types. Details are shown in Table 7-2 below.

**Table 7-2. Profile of the EPY5 Population and Gross Savings Sample by Business Type**

| Business Type | Ex-Ante Claimed Savings | | | | | |
|---|---|---|---|---|---|---|
| | Gross kWh, Population | | Project Count, Sample | | Gross kWh, Sample | |
| Retail/Service | 34,237 | 13% | 11 | 9% | 747 | 3% |
| Office | 38,740 | 15% | 21 | 18% | 4,873 | 17% |
| Light Industry | 39,278 | 15% | 18 | 15% | 4,253 | 15% |
| Warehouse | 46,831 | 18% | 13 | 11% | 4,281 | 15% |
| Grocery | 5,345 | 2% | 3 | 3% | 668 | 2% |
| Heavy Industry | 22,501 | 9% | 8 | 7% | 1,155 | 4% |
| Medical | 14,642 | 6% | 9 | 8% | 4,200 | 15% |
| Restaurant | 645 | 0% | 2 | 2% | 5 | 0% |
| College / University | 3,643 | 1% | 1 | 1% | 88 | 0% |
| Hotel/Motel | 8,761 | 3% | 10 | 8% | 2,732 | 9% |
| K-12 School | 1,324 | 1% | - | 0% | - | 0% |
| Miscellaneous | 46,350 | 18% | 24 | 20% | 5,765 | 20% |
| **Total** | **262,295** | **100%** | **120** | **100%** | **28,767** | **100%** |

*Source: Utility tracking data and Navigant analysis.*

**Engineering Review of Project Files**

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

To support this review, ComEd provided project documentation in electronic format for each sampled project. Documentation included some or all of scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports and photos (when required), post inspection reports and photos (when conducted), calculation spreadsheets, a project summary report, and important email and memoranda.

**On-Site Data Collection**

On-site surveys were completed for a subset of 42 of the 120 customer applications sampled. For most projects on-site sources include interviews that are completed at the time of the on-site, visual inspection of the systems and equipment, EMS data downloads, spot measurements, and short-term monitoring (e.g., less than four weeks).

An analysis plan is developed for each project selected for on-site data collection. Each plan explains the general gross impact approach used (including monitoring plans), provides an analysis of the

current inputs (based on the application and other available sources at that time), and identifies sources that will be used to verify data or obtain newly identified inputs for the ex post gross impact approach.

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

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

**Site-Specific Impact Estimates**

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

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

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

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

After completion of the engineering analysis, a site-specific draft impact evaluation report is prepared that summarizes the M&V plan, the data collected at the site, and all of the calculations and

parameters used to estimate savings. Each draft site report underwent engineering review and comment, providing feedback to each assigned engineer for revisions or other improvements. Each assigned engineer then revised the draft reports as necessary to produce the final site reports.

**Research Findings for the Gross Impact Sample**

In Table 7-3 below we present the research findings results by end-use for sampled projects. Un-weighted realization rates are provided in the table, but since the results shown are not weighted by strata, they are not representative of the realization rate for the population.

**Table 7-3. Research Findings for the Gross Impact Sample – By End-Use**

| End Use | Measure Count | Sample-Based Ex Ante Gross kWh | Sample-Based Ex Ante Gross kW | Sample-Based Research Finding Gross kWh | Sample-Based Research Finding Gross kW | Sample-Based Research Finding Gross kWh Realization Rate | Sample-Based Research Finding Gross kW Realization Rate |
|---|---|---|---|---|---|---|---|
| LIGHTING | 211 | 19,703,186 | 2,963 | 23,203,190 | 3,706 | 1.18 | 1.25 |
| HVAC (VSD/IS_VSD)/ AIR_COMP/HVAC EQUIPMENT | 65 | 5,856,546 | 1,049 | 6,546,934 | 1,014 | 1.12 | 0.97 |
| REFRIG | 13 | 732,878 | 69 | 1,038,581 | 99 | 1.42 | 1.43 |
| FOOD SERVICE/OTHER | 8 | 2,473,955 | 1,960 | 189,341 | 10 | 0.08 | 0.01 |
| TOTAL | 297 | 28,766,564 | 6,041 | 30,978,045 | 4,829 | 1.08 | 0.80 |

*Source: Evaluation analysis*

*† Energy and demand realization rates shown are un-weighted, and do not reflect population estimates of realization rates.*

**CATI Survey Responses to Impact Questions**

A brief set of questions in the CATI survey was asked regarding installed lighting measures, removed equipment, and installation in non-air-conditioned space. Table 7-4 identifies the survey question or issue that was addressed, the participant responses, and conclusions.

**Table 7-4. Participant Reponses to CATI T12 Lighting Impact Questions**

| Survey Question | Participant Responses | EM&V Conclusion |
|---|---|---|
| What type of lighting was removed when you installed <MEASD1/2/3> through the Smart Ideas for Your Business program? | 54 participants responded to this question: 21 responded linear fluorescent light, 18 respondents for Metal Halide Fixtures, 2 mentioned High Pressure Sodium, 1 Incandescent, and 17 mentioned "other or don't know" but did not specify. | Responses are consistent with Illinois TRM assumptions for the new fixtures installed on deemed measures.<br><br>Only 12 of 63 (19%) of sampled lighting respondents in EPY5 mentioned T12 lighting as an existing fixture. By contrast, 31 of 93 (33%) sampled lighting participants reported T12s in EPY3, and 24 of 82 (29%) reported T12s in EPY4. This finding points to a trend of decreasing prominence of T12 lighting in the program. |
| What types of linear fluorescent lights were removed? | 12 mentioned T12 Fixtures (1.5' diameter bulbs), 2 mentioned standard performance T8 fixtures (1' diameter bulbs), 1 mentioned T5, and the remainder did not know or specify. | |
| Are you aware of the fact that federal standards for lighting equipment recently changed so that there are now restrictions on the production of T12 lamps for sale in the U.S? | 9 responded "Yes" and 3 said "No". | Although this is a very small sample, it suggests some customers are not familiar with recent changes in Federal standards on fluorescent lighting, and there is still a role for independent third-parties (associations, non-profits, ComEd) to provide customer education on this issue, and not rely solely on trade allies to get the word out. Although we did not ask customers to name all of the selling points offered up by trade allies, we see that customers are recalling different messages. |
| What are lighting contractors and suppliers telling you about these changes in federal standards? | 5 respondents answered the question "Never mentioned Federal standard" or similar, 1 mentioned the TA said T12s are still produced and were recommended, 3 others that the TA said they would soon be harder to get, and 2 others mentioned failures, lighting quality, and cost issues. | |
| Prior to participating in the program, did you consider trying to maintain your T12 system with spare or compliant T12 lamps and electronic T12 ballasts? | 5 respondents said "Yes" and 3 said "No". | This is a small sample, but it suggests the T12 market is transitioning but not transformed to HP T8s.<br><br>Some customers are experiencing failures and anticipating near-term replacements, while others are not seeing failures and are not having trouble replacing T12 lamps. At least some customers have the ability and the intention to maintain their T12 lighting indefinitely.<br><br>A larger sample would be needed to confirm the current state of the T12 market. |
| Were you experiencing a noticeable amount of failures in the T12 system due to aging T12 lamps or ballast? | 8 respondents said "Yes" and 1 said "No" on T12 lamps, but 5 respondents said "Yes" and 6 said "No" on T12 ballast. | |
| Did you have any troubles finding replacement T12 lamps? | 9 respondents said "No" and 1 said "Yes" | |
| If you had not participated in the program, when would you have replaced your T12 lighting? | 3 respondents said within one year, 2 said within 1 and 2 years, and 4 respondents said 2 or more years later. | |

*Source: Participant survey*

**Research Findings Realization Rate for the EPY5 Standard Program**

A stratified ratio estimation technique was used to estimate evaluation research findings gross energy savings for the Standard program. The stratified ratio estimation technique follows the steps outlined in the California Evaluation Framework[25]. These steps are matched to the stratified random sampling method that was used to create the sample for the program savings verification effort. The standard error was used to estimate the error bound around the estimate of evaluation research findings gross energy savings realization rate. The research findings gross realization rates and relative precision at 90% confidence interval for lighting and non-lighting end-uses are summarized in Table 7-5 and Table 7-6 below.

**Table 7-5. Research Findings Realization Rates and Relative Precision for Lighting End-use**

| | | Lighting End-use | | | |
|---|---|---|---|---|---|
| Population Group | Sampling Strata | Mean kWh RR | KWh Relative Precision at 90% Level of Confidence ± % | Mean kW RR | kW Relative Precision at 90% Level of Confidence ± % |
| Lighting Wave 1 | 1 | 1.07 | 10% | 1.19 | 9% |
| | 2 | 0.98 | 10% | 1.04 | 8% |
| | 3 | 0.97 | 9% | 1.29 | 33% |
| Lighting Wave 2 | 1 | 1.74 | 82% | 1.64 | 71% |
| | 2 | 1.09 | 14% | 1.24 | 16% |
| | 3 | 1.04 | 3% | 1.22 | 27% |
| ***Lighting Subtotal*** | | 1.09 | 12% | 1.23 | 12% |

*Source: Evaluation analysis*

**Table 7-6. Research Findings Realization Rates and Relative Precision for Non-Lighting End-use**

| | | Non-Lighting End-use | | | |
|---|---|---|---|---|---|
| Population Group | Sampling Strata | Mean kWh RR | kWh Relative Precision at 90% Level of Confidence ± % | Mean kW RR | kW Relative Precision at 90% Level of Confidence ± % |
| Non-Lighting Wave 1 | 1 | 0.86 | 15% | 0.26 | 30% |
| | 2 | 0.78 | 25% | 0.24 | 59% |
| | 3 | 0.71 | 41% | 0.24 | 180% |
| Non-Lighting Wave 2 | 1 | 0.98 | 54% | 1.05 | 58% |
| | 2 | 1.09 | 32% | 1.00 | 4% |
| | 3 | 0.63 | 64% | 0.06 | 256% |
| ***Non-Lighting Subtotal*** | | 0.84 | 15% | 0.51 | 25% |

*Source: Evaluation analysis*

**Research findings:**

[25] TecMarket Works, et al., *The California Evaluation Framework*, Chapter 13, Sampling. June 2004

1. The savings verification and research findings results share the same evaluation adjustments on the following parameters: eligibility, quantities, business type, and measure type. They differ on these evaluation adjustments: savings per eligible unit installed. Where the verification savings per unit relies on deemed values and ComEd savings documentation, the research findings incorporate all available site-specific data gathered and evaluation engineering judgments to estimate the actual savings at each site evaluated. This research data includes customer interviews, spot measurements, analysis of equipment trend data, short term metering and data logging, and engineering review of equipment specifications. On some measures where site data was not collected (generally the file review sample), the research findings often concluded the deemed value or KEMA EPY5 Workpapers provided the best available assumptions.
2. The research findings estimate a higher gross realization rate on energy savings for lighting end-use (1.09) when compared with savings verification (1.02) for the following reasons: Lighting hours of use on some projects were substantially higher than the deemed assumption.
3. The research findings estimate a lower realization rate on energy savings for the non-lighting end-use (0.84) when compared with savings verification (0.92) for the following reasons: 1) Some eligible HVAC variable speed drive measures were found to save less energy than deemed. 2) Several Hotel Guest Room Energy Management measure installations we sampled had very low realization rates on research savings estimates, compared with the deemed value from the Illinois TRM.
4. An additional factor that lowered the research findings for non-lighting energy savings compared with ex-ante energy savings were low realization rates on sampled energy management controls projects.
5. The research findings estimate a higher realization rate on peak demand reduction for lighting (1.23) when compared with the savings verification realization (1.21) due to minor differences in fixture delta watts and occupancy sensor savings.
6. The research findings estimate a lower realization rate on peak demand reduction for non-lighting (0.51) when compared with savings verification peak demand reduction realization rate (0.53) due to the net sum of higher and lower evaluation research adjustments on several measures, primarily HVAC variable speed drives, chillers, and guest room energy management controls (versus the savings verification demand estimate).
7. The research findings and savings verification for lighting peak demand savings were significantly higher than ex-ante peak demand due to the issue of improperly calculated ex ante demand savings for occupancy sensors, as describe in Section 3.
8. The research findings and savings verification non-lighting peak demand savings were significantly lower than ex-ante peak demand due to the issue of improperly over-estimated ex ante demand savings for guest room energy management systems, and instances of ineligible chillers and HVAC variable speed drives as described in Section 3.
9. While in some cases deemed HVAC VSD savings over-estimate our research findings, we found a number of VSD projects that had deemed energy savings that were less than our research findings. The Illinois TRM algorithm obtains deemed input values from different sources for variables that are interdependent: default motor load factor (from ComEd workpapers), energy and demand savings factors (Connecticut Saves Energy), and default hours of operation (ComEd workpapers). An internally consistent set of

assumptions for these three key variables should be developed through the Illinois TRM update process.

**Research Findings Gross Program Impact Summary Results**

Based on the gross impact parameter research findings described previously, the evaluation research findings gross program impacts were derived for the EPY5 Standard Program. The results are provided in Table 7-7.

**Table 7-7. Research Findings Gross Realization Rates and Savings Estimates**

| End-Use Segment | kWh, Ex Ante Gross Savings | kWh, Research Finding Gross Savings | kWh RR | kW, Ex Ante Gross Savings | kW, Research Finding Gross Savings | kW RR |
|---|---|---|---|---|---|---|
| Lighting End-use | 197,993,500 | 215,964,332 | 1.09 | 28,991 | 35,656 | 1.23 |
| Non-Lighting End-use | 64,301,918 | 54,221,185 | 0.84 | 13,232 | 6,771 | 0.51 |
| Total | 262,295,417 | 270,185,517 | 1.03 | 42,223 | 42,427 | 1.00 |

*Source: Evaluation analysis*

We conclude that program tracking ex ante estimates of lighting gross energy savings are conservative overall, but that ex ante savings for non-lighting measures have inconsistent realization results across the end-use and measures types, high and low, that should be the emphasis for improving ex ante savings estimates.

### 7.2.1 Research Findings Net Program Impact Results

The primary objective of the evaluation research net savings analysis for the Standard program was to determine the program's net effect on customers' electricity usage. After gross program impacts have been assessed, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio that quantifies the percentage of the gross program impacts that can be reliably attributed to the program.

For EPY5, the evaluation research net program impacts were quantified from the estimated level of free-ridership and participant spillover and spillover estimated by participating trade allies. Quantifying free-ridership requires estimating what would have happened in the absence of the program. A customer self-report method, based on data gathered during participant telephone interviews, was used to estimate the free-ridership for this evaluation. The existence of participant spillover was quantitatively examined by identifying spillover candidates through questions asked in the participant telephone interviews. Participating trade allies were interviewed to obtain their estimates of spillover – without distinction between ComEd customer participants or non-participants. After we estimated spillover from customers and trade ally interview data, we examined the results to factor out potential double-counting of energy savings projects.

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

NTG Ratio = 1 – Free-ridership Rate + [Spillover Estimated by Participating Trade Allies + Spillover Estimated by Participating Customers, adjusted for double counting]

#### *7.2.1.1 Free-Ridership*

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

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

Each of these scores represents the highest response or the average of several responses given to one or more questions about the decision to install a program measure. The rationale for using the maximum value is to capture the most important element in the participant's decision making. This approach and scoring algorithm were identical to that used for the Ameren Illinois C&I rebate program, and similar to that used for gas C&I programs.

In EPY5, if a Basic Rigor respondent identified a vendor as an "other factor" that was influential, and the vendor was registered as a ComEd trade ally or trade associate, the "other factor" score for that vendor was included among program influences in the "Timing and Selection" score.

**Standard Rigor Free-Ridership Assessment**
For projects that receive greater program funding levels in excess of $50,000, an effort is made during the customer telephone interview to more completely examine project influence sources in order to allow for any analyst-determined adjustments to customer self-reported score calculations using the Basic approach outlined above. Additional survey batteries examine other project decision-making influences including the vendor, ComEd Account Manager, age and condition of existing equipment, corporate policy for efficiency improvements and so on. Any adjustments made on this basis are carefully documented and the rationale for any adjustments is provided, to ensure their transparency to the reviewer.

In a Standard Rigor Free-Ridership Assessment, program influence through vendor or ComEd Account Manager recommendations is incorporated into the Timing and Selection score, if a follow-

up interview has been triggered. The purpose of this additional component is to assess the influence of the program on vendors for programs that are vendor-driven, where the utility has specific outreach and assistance efforts targeting vendors. The vendor or account manager interviews provide insight into multiple points of program influence exerted into large and often complex participating customer organizations. Follow-up interviews are triggered only where the customer had not already assigned a maximum program influence score to one of the other program components, and the interview result may affect the final NTG score.

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

Responses are used to calculate a Timing and Selection score, a Program Influence score and a No-Program score for each project covered through the survey. These three scores can take values of 0 to 10 where a lower score indicates a higher level of free-ridership. The calculation then averages those three scores to come up with a project-level free-ridership level. If the customer has additional projects at other sites covering the same end-use, the survey asks whether the responses also apply to the other projects. If that is the case, the additional projects are given the same score.

**NTG Scoring (Free-ridership only)**

The net-to-gross scoring approach is summarized in Table 7-8.

**Table 7-8. Net-to-Gross Scoring Algorithm (Free-Ridership only) for the EPY5 Standard Program**

| Scoring Element | Calculation |
|---|---|
| **Timing and Selection score.** The maximum score (scale of 0 to 10 where 0 equals not at all influential and 10 equals very influential) among the self-reported influence level the program had for:<br>A. Availability of the program incentive<br>B. Recommendation from utility program staff person<br>C. Information from utility or program marketing materials<br>D. Endorsement or recommendation by utility account manager<br>E. Other factors (recorded verbatim)<br>F. Information provided through technical assistance received from utility or KEMA field staff<br>G. Vendor Score (when triggered)<br>H. Account Manager Score (when triggered) | Basic Rigor: Maximum of A, B, C, D, and E<br><br>Standard Rigor: Maximum of A, B, C, D, E, F, G, and H |
| **Program Influence score.** "If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <ENDUSE>, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?" | Points awarded to the program (divided by 10). Divide by 2 if the customer learned about the program AFTER deciding to implement the measure that was installed |
| **No-Program score.** "Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely," if the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment?" The NTG algorithm computes the Likelihood Score as 10 minus the respondent's answer (e.g., the likelihood score will be 0 if extremely likely to install exactly the same equipment if the program had not been available).<br><br>Adjustments to "Likelihood score" are made for timing: "Without the program, when do you think you would have installed this equipment?" Free-ridership diminishes as the timing of the installation without the program moves further into the future. | Interpolate between Likelihood Score and 10 to obtain the No-Program score, where<br>If "At the same time" or within 6 months then the No Program score equals the Likelihood Score, and if 48 months later then the No Program Score equals 10 (no free-ridership) |
| Project-level Free-ridership (ranges from 0.00 to 1.00) | 1 – Sum of scores (Timing & Selection, Program Influence, No-Program)/30 |
| "Our records show that <COMPANY> also received an incentive from <UTILITY> for a <different end use> project at <same ADDRESS>. Was the decision making process for the <different end use> project the same as for the <ENDUSE> project we have been talking about?" | If participant responds "same decision," assign free-ridership score to other end-uses of the same project |
| "Our records show that <COMPANY> also received an incentive from <UTILITY> for <number> other <ENDUSE> project(s). Was it a single decision to complete all of those <ENDUSE> projects for which you received an incentive from <UTILITY> or did each project go through its own decision process?" | If participant responds "single decision," assign free-ridership score to same end-use of the additional projects (projects with separate project ID's) |
| EPY5 Project level Net-to-Gross Ratio (free-ridership only) | 1 – Project level Free-ridership |

*Source: Evaluation team*

In EPY5, 32 of 127 respondents in our sample went through the standard rigor approach. No projects triggered follow-up interviews. Non-program influences were weighed against program influences in the Timing & Selection score on a project-by-project basis. No adjustments were made to increase or decrease free-ridership for non-program influences, based on a qualitative review of participant responses.

In EPY5, the evaluation team examined NTG ratios accounting for free-ridership only (FR-only) for two subgroups of the overall population: Lighting and Non-lighting. The additional NTG ratio subgroup tables were requested in previous program years based on review of evaluation reports. The NTG (without trade ally spillover) for lighting increased from 0.70 in EPY4 to 0.74 in EPY5, and significantly for non-lighting projects from 0.63 to 0.69. Compared to EPY3 and EPY4, the EPY5 sample design produced a much better precision to estimate a Non-lighting NTG ratio.

The NTG ratio and relative precision at a 90% confidence level for projects with lighting energy savings, based only on the lighting portion of project-level savings, is provided in Table 7-9.

**Table 7-9. NTG Ratio (FR-only) and Relative Precision at 90% Confidence Level – Lighting**

| Sample Strata | Population (N=2,563) | NTG Interviews (n=63) | NTG Sample (n=70) | Sample kWh Wgts. | Relative Precision ± % | Low | NTGR Mean | High |
|---|---|---|---|---|---|---|---|---|
| 1 | 108 | 21 | 21 | 0.33 | 7% | 0.70 | 0.76 | 0.81 |
| 2 | 367 | 21 | 21 | 0.34 | 6% | 0.76 | 0.80 | 0.85 |
| 3 | 2,088 | 21 | 28 | 0.33 | 15% | 0.56 | 0.66 | 0.76 |
| Total | 2,563 | 63 | 70 | 1.00 | 5% | 0.70 | 0.74 | 0.78 |

*Source: Evaluation analysis. The NTG does not include trade ally spillover.*

The NTG ratio and relative precision at a 90% confidence level for projects with non-lighting energy savings, based on the variable speed drive, HVAC equipment, IS_VSD, Air Compressors, Other, or Refrigeration portion of project-level savings, is provided in Table 7-10. Based on these results, we recommend applying the NTG findings to non-lighting measures.

**Table 7-10. NTG Ratio (FR-only) and Relative Precision at 90% Confidence Level – Non-Lighting**

| Sample Strata | Population (N=981) | NTG Interviews (n=64) | NTG Sample (n=278) | Sample kWh Wgts. | Relative Precision ± % | Low | NTGR Mean | High |
|---|---|---|---|---|---|---|---|---|
| 1 | 49 | 10 | 10 | 0.32 | 29% | 0.45 | 0.64 | 0.82 |
| 2 | 161 | 32 | 32 | 0.27 | 12% | 0.52 | 0.59 | 0.66 |
| 3 | 771 | 22 | 236 | 0.41 | 1% | 0.79 | 0.80 | 0.81 |
| Total | 981 | 64 | 278 | 1.00 | 8% | 0.63 | 0.69 | 0.74 |

*Source: Evaluation analysis. The NTG does not include trade ally spillover.*

#### *7.2.1.1 Spillover*

**Participant Spillover**

For the EPY5 Standard program evaluation, a battery of questions was asked to identify spillover candidates and to encourage spillover candidates to participate in a follow-up interview by an engineer to quantify spillover savings. Below are paraphrased versions of the spillover questions that were asked:

1. Since your participation in the ComEd program, did you implement any ADDITIONAL energy efficiency measures at this facility or at your other facilities within ComEd's service territory that did NOT receive incentives through any utility or government program?
2. On a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Smart Ideas program influence your decision to install high efficiency equipment on your own?
3. Why do you give the ComEd program this influence rating?

If the response to question 2 was given a score of 7 or higher, we judged the respondent to be a spillover candidate. Spillover candidates were asked additional questions:

4. What was the first measure that you implemented?
    a. Why did you purchase this equipment without the incentive available through the Smart Ideas program?
5. What was the second measure that you implemented?
    a. Why did you purchase this equipment without the incentive available through the Smart Ideas program?
6. Thank you for sharing this information with us. We may have follow-up questions about the equipment you installed outside of the program. Would you be willing to speak briefly with a member of our team?

All respondents who answered "yes" to question 6 that they would be willing to speak with a member of our team were eligible to be contacted for an engineering interview to confirm that spillover had occurred and gather data to estimate the energy savings.

**Participant Spillover Findings**

The evidence of spillover from the CATI participant survey for the Standard program is presented in Table 7-11 below.

**Table 7-11. EPY5 Standard Program Spillover Evidence from the Participant Telephone Survey**

| Spillover Question | Evidence of Spillover |
|---|---|
| Since your participation in the ComEd program, did you implement any additional energy efficiency measures at this facility that did NOT receive incentives through any utility or government program? | Of the 127 survey respondents, 30 (24%) said "Yes" |
| On a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Smart Ideas program influence your decision to install high efficiency equipment on your own? | Scoring is as follows:<br>(1) "Don't Know"<br>(7) Rating of 0 to 3<br>(8) Rating of 4 to 6<br>(13) Rating of 7 to 10s |
| EPY5 Spillover Candidates (influence 7 or higher) | 13 participants from 127 survey respondents (10%) |
| Of the 13 spillover candidates, how many remain after evaluation review of additional responses to confirm they understood the questions and may have had projects in ComEd territory. | 7 candidates remained after evaluation review. |
| EPY4 Spillover Candidates (influence 7 or higher) | 11 participants from 110 survey respondents (10%) |

*Source: Evaluation analysis*

Among the reasons that spillover candidates did not participate in the program (paraphrased):

- Had reached the maximum incentive amount
- No time to participate, needed equipment immediately
- Takes too long to get approval
- The equipment did not qualify
- Did not understand the program

These findings suggested that participant spillover effects for EPY5 are evident, similar to EPY4. In EPY4, participant spillover of 1 percent was estimated based on follow-up interviews conducted by an engineer to quantify spillover savings. Because the number of EPY5 spillover candidates and their responses are similar to EPY4, we expected the EPY5 interviews would return a similar spillover estimate.

We believe that spillover estimated by participating customers overlaps with spillover estimated by participating trade allies, and we concluded that the EPY5 evaluation spillover adjustment should be the higher of the two estimates. When the participating trade ally estimate of spillover was measured at 5 percent for lighting and 6 percent for non-lighting, as described below, we relied solely on the trade ally estimate for EPY5 spillover and we did not conduct follow-up interviews with EPY5 customer spillover candidates.

**Participating Trade Ally Spillover Findings**

Navigant conducted trade ally evaluation research in EPY5 to estimate spillover for participants and non-participants in the Standard program. Separate spillover estimates were developed for lighting and non-lighting savings. The crosscutting Business programs conducted survey research with trade allies that included a set of questions to estimate spillover, without distinction between spillover occurring in participating or non-participating customers. Of the 60 trade ally interviews, 31 participated in the Standard program in EPY5, and provided part of the sample used to estimate Standard program spillover. The crosscutting research included interviews with 29 business sector trade allies that did not participate in the EPY5 Standard program.

After the crosscutting research was completed, a second telephone survey was conducted with a supplemental sample of 30 additional Standard program lighting trade allies that had participated in EPY5. This supplemental survey included an expanded set of questions to quantify spillover, explore trade ally and customer behavior, and obtain insight on the T12 lighting phase-out. This CATI survey was completed in October and November, 2013.

Spillover was estimated by participating trade allies using the following algorithm:

***Trade Ally Estimated SO*** ***= (Sales of qualifying equipment that does not receive an incentive from ComEd) * Program Influence Score***

The trade ally survey began with several questions to understand trade ally and customer awareness of the program, and how the program has influenced their work. Questions then proceed to the core spillover questions that were used to obtain data for the above algorithm (below specifically for lighting trade allies):

SO2. Before your involvement in ComEd's program, what percentage of your sales included high efficiency lighting equipment that now qualifies for an incentive from ComEd? [Numeric 0-100, 998=Don't know, 999=Refused]

SO3. Since your involvement in ComEd's program, what percentage of your sales now includes high efficiency lighting equipment that qualifies for an incentive from ComEd? [Numeric 0-100, 998=Don't know, 999=Refused]

SO4. Thinking about your sales of lighting equipment that qualifies for a ComEd incentive, in what percentage of those sales do customers actually receive an incentive from ComEd? [Numeric 0-100, 998=Don't know, 999=Refused]

***Program Incentivized Sales= Qualifying Sales * SO4***

or,

***Qualifying Sales = Program Incentivized Sales / SO4***

At this point, since we can quantify ***Program Incentive Sales*** using data from the ComEd tracking system, we can estimate a quantify of ***Qualifying Sales.*** The response to SO4 can also be used estimate *potential* spillover sales, as follows:

***Sales of qualifying equipment that does not receive an incentive from ComEd*** ***= Qualifying Sales * (1 – SO4)***

The results to this point were checked with the respondent by creating a variable: 1-SO4=<No_Inc>

SO5. Does this mean then that <No_Inc> percent of your sales of lighting equipment qualifies for the Standard incentives program but DOES NOT receive an incentive from ComEd?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

To estimate spillover, we need to know the amount of influence the trade ally assigns to ComEd for sales of qualifying equipment that does not receive an incentive from ComEd.

SO6. To the best of your knowledge, on a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did ComEd's program influence your sales of qualifying lighting equipment to these non-participating customers ? [Numeric 0-10, 98=Don't know, 99=Refused]

The response to question SO6 is the ***Program Influence Score***. By making substitutions with program sales and response data, we can estimate spillover.

***Trade Ally Estimated SO*** ***= (Sales of qualifying equipment that does not receive an incentive from ComEd) * Program Influence Score***

***Trade Ally estimate of Spillover*** ***= Qualifying Sales * (1 – SO4) * SO6***

***Trade Ally estimate of Spillover*** ***= Program Incentivized Sales/ SO4 * (1 – SO4) * SO6***

Questions SO2 and SO3 were used as a secondary check on the estimate of qualifying sales.

The results of the trade ally surveys are summarized in Table 7-12 and Table 7-13.

**Table 7-12. Lighting Spillover Estimated by EPY5 Standard Trade Allies**

| Trade Ally Survey Group | Interviews | EPY5 Standard Lighting Ex Ante Savings, kWh | Trade Allies Reporting Spillover | Spillover Estimate, kWh | Spillover Estimate |
|---|---|---|---|---|---|
| Crosscutting Research | 25 | 29,176,501 | 5 | 995,434 | 0.03 |
| Supplemental Interviews | 30 | 35,079,319 | 7 | 2,112,676 | 0.06 |
| Total | 55 | 64,255,820 | 12 | 3,108,111 | 0.05 |

*Source: Evaluation analysis. The population for sampling of participating lighting trade allies in the EPY5 Standard program was 444 firms, based on Navigant analysis of August 2, 2013 tracking data.*

**Table 7-13. Non-Lighting Spillover Estimated by EPY5 Standard Trade Allies**

| Trade Ally Survey Group | Interviews | EPY5 Standard Non-Lighting Ex Ante Savings, kWh | Trade Allies Reporting Spillover | Non-Lighting Spillover Estimate, kWh | Non-Lighting Spillover Estimate |
|---|---|---|---|---|---|
| Crosscutting Research | 10 | 1,298,106 | 5 | 82,187 | 0.06 |
| Supplemental Interviews | 0 | NA | NA | NA | NA |
| Total | 10 | 1,298,106 | 5 | 82,187 | 0.06 |

*Source: Evaluation analysis. The population for sampling of participating non-lighting trade allies in the EPY5 Standard program was 133 firms, based on Navigant analysis of August 2, 2013 tracking data.*

The total spillover estimates for lighting (0.05) and non-lighting (0.06) are added to the NTG estimate. There may be overlap between the trade ally spillover estimates and estimates from participating customers. We chose the trade ally spillover estimate, because it covers participant and non-participant spillover. We estimate the relative precision for the interview samples to be ± 11% for lighting, and ± 28% for non-lighting, at a 90% level of confidence. Although the precision for non-lighting spillover is low, non-lighting spillover will have a small effect on the overall Standard program net savings.

**Feedback from Lighting Trade Allies on the T12 market**

After the crosscutting research was completed, a second telephone survey was conducted with a supplemental sample of 30 additional Standard program trade allies that had participated in EPY5. This supplemental survey included an expanded set of questions to quantify spillover, explore trade ally and customer behavior, and obtain insight on the T12 lighting phase-out. This CATI survey was completed in October and November, 2013. The findings and conclusions from the T12 lighting system questions are provided in Table 7-14 through Table 7-18.

**Table 7-14. Participating Trade Ally Reponses on Customer Awareness of Federal T12 Standards**

| Survey Question | Response from Lighting Trade Allies that Participated in the EPY5 Standard Program (Based on 30 Interviews) | |
|---|---|---|
| On a scale of 0-10, with 0 being "not at all" and 10 being "extremely aware", how aware are businesses of the recently changed federal standards for T12 lighting? [0-10, 98="Don't know," 99="Refused"] | **Scale** | **Score** |
| | 0-1 | 7% |
| | 2-4 | 23% |
| | 5-7 | 44% |
| | 8-10 | 23% |
| | No Answer | 3% |

*Source: Interviews with 30 lighting trade allies that participated in the EPY5 Standard program, conducted September-October 2013.*

Nearly one-third of the trade allies surveyed considered businesses to have low awareness (score 4 or less) of the Federal T12 standard. ComEd should consider continuing to facilitate informational outreach on the T12 phase out with customers, because there appears to be remaining customers with low awareness. Lacking awareness of the Federal standard, some may be inclined to maintain their T12 lighting for several more years, as suggested by the interviews with participating customers. Open ended responses from trade allies (Table 7-18) indicated awareness of the T12 standard was an effective motivator for action.

**Table 7-15. Participating Trade Ally Reponses about Customer T12 Systems Maintenance Steps**

| Survey Question | Response from Lighting Trade Allies that Participated in the EPY5 Standard Program (Based on 30 Interviews) |
|---|---|
| On a scale of 0-10, with 0 being "not at all common" and 10 being "extremely common", how common is it for businesses with T12 lighting to maintain their T12 systems by taking these steps: [0-10, 98="Don't know," 99="Refused"]<br><br>(Score on three choices read to respondents) | Installing "compliant" T12 lamps<br>**Scale** **Score**<br>0-1 33%<br>2-4 20%<br>5-7 20%<br>8-10 14%<br>No Answer 13% |
| | Installing electronic T12 ballasts<br>**Scale** **Score**<br>0-1 30%<br>2-4 30%<br>5-7 17%<br>8-10 10%<br>No Answer 13% |
| | Installing stockpiled T12 lamps<br>**Scale** **Score**<br>0-1 17%<br>2-4 20%<br>5-7 17%<br>8-10 33%<br>No Answer 13% |

*Source: Interviews with 30 lighting trade allies that participated in the EPY5 Standard program, conducted September-October 2013.*

The average score for using compliant T12 lamps is 3.5, and 3.2 for installing electronic ballasts. The average score for installing stockpiled T12 lamps is 5.4. Using stockpiled T12 lamps appears to be the most common approach for maintaining T12 lighting systems, although businesses are using multiple methods to stall off retrofits. One trade ally mentioned that "…a lot of people went out and bought cases and cases of lamps...". These responses suggest that businesses still have options available to maintain T12 lighting, allowing a segment of the business population to resist retrofitting.

ComEd should consider continuing to facilitate T12 phase out with customers, because market forces and Federal standards have not entirely overtaken the T12 market.

**Table 7-16. Participating Trade Ally Reponses on Non-Program Factors Causing Customers to Upgrade T12 Lighting**

| Survey Question | Response from Lighting Trade Allies that Participated in the EPY5 Standard Program (Based on 30 Interviews) |
|---|---|
| On a scale of 0-10, with 0 being "not at all important" and 10 being "extremely important", how important are the following factors in causing businesses to upgrade their T12 lighting systems: ? [0-10, 98="Don't know," 99="Refused"]<br><br>(Score on four choices for Non-Program factors read to respondents) | <u>Excessive number of T12 lamp failures</u><br>**Scale** **Score**<br>0-1 6%<br>2-4 20%<br>5-7 40%<br>8-10 27%<br>No Answer 7% |
| | <u>Excessive number of T12 ballast failures</u><br>**Scale** **Score**<br>0-1 10%<br>2-4 17%<br>5-7 33%<br>8-10 37%<br>No Answer 3% |
| | <u>Cost of operating T12 lighting</u><br>**Scale** **Score**<br>0-1 3%<br>2-4 27%<br>5-7 20%<br>8-10 47%<br>No Answer 3% |
| | <u>Poor lighting quality</u><br>**Scale** **Score**<br>0-1 6%<br>2-4 17%<br>5-7 13%<br>8-10 57%<br>No Answer 7% |

*Source: Interviews with 30 lighting trade allies that participated in the EPY5 Standard program, conducted September-October 2013.*

The average score for excessive number of T12 lamp failures is 5.9, and 6.0 for T12 ballast failure. The average score on the cost of operating T12 lighting is 6.5, and 7.0 for poor lighting quality.

These responses indicate that lighting component failures are an important non-program factor in triggering upgrades. The most important factors cited by trade allies that cause upgrades are cost of operation and poor lighting quality. This suggests an opportunity to influence upgrades even where businesses are capable of maintaining their T12 systems. This suggests there continues to be a role for ComEd and trade allies to educate business customers, emphasizing cost of operation and poor lighting quality to accelerate T12 upgrades.

**Table 7-17. Participating Trade Ally Reponses – Years to Phase out T12s**

| Survey Question | Response from Lighting Trade Allies that Participated in the EPY5 Standard Program (Based on 30 Interviews) | |
|---|---|---|
| How many years do you expect it will take before most non-compliant T12 lighting systems are changed out to T8's, T5s, or some other compliant lighting system? [NUMERIC OPEN END, 98="Don't know," 99="Refused'] | **Years** | **Score** |
| | 0-1 | 6% |
| | 2-4 | 57% |
| | 5-7 | 17% |
| | 8-10 | 10% |
| | No Answer | 10% |

*Source: Interviews with 30 lighting trade allies that participated in the EPY5 Standard program, conducted September-October 2013.*

The responses indicate that about two-thirds of participating trade allies interviewed thought that most T12 lighting systems would be gone within the next four years. The Illinois TRM that states that standard T8s should become the baseline on January 1, 2016 and the survey responses do not conflict with that approach.

About one-quarter of trade allies thought it would take 5 to 10 years, suggesting that T12s could linger as the last of the laggards resist change until they are forced or convinced to change out their T12 systems.

Unless Standard lighting free-ridership increases substantially, there remains a role for the program to work with trade allies, offer rebates, and facilitate the shift of T12 lighting out of C&I spaces through 2015. ComEd should consider an initiative to remove stockpiles of T12 lamps to accelerate the phase-out.

**Table 7-18. Participating Trade Ally Open Ended Reponses to Questions about Customer T12 Lighting Systems**

| Survey Question: How have recent changes in Federal T12 lamp standards affected your company's approach to selling high-efficiency T8 or T5 linear fluorescent lighting equipment? |
|---|
| Response from Lighting Trade Allies that Participated in the EPY5 Standard Program (Based on 30 Interviews) |
| We sell a lot more of it that we would have otherwise. |
| We only do efficient equipment so it has made it better for us to get projects |
| We bring that up whenever we are asked to install T12's, and we tell them about the rebate and encourage them to change to T5's or T8's. |
| The suggestions we make to customers. |
| Tell them the benefits of everything. |
| It's got us more focused on customers who have older technology |
| It is an easy sale because they can't purchase any other lamps. It has helped them think about changing even if it takes them awhile to make the change. |
| It helped us sell more |
| It helped people who were hanging on to their old technology understand that they don't have a choice any more. It got a lot of people to move that weren't moving before. |
| It has affected our business greatly with the addition of the incentives |
| It has changed the brands we promote and the stocks on the shelves. |
| Increased focused on more efficient technology. |
| I think it will take another 2 years a lot of people went out and bought cases and cases of lamps |
| Greatly, well once the T12 became not manufactured the customers have become more interested in changing their lighting now instead of waiting. |
| Greatly influenced it. Helped a lot. More difficult to sale energy efficient upgrades before things started going obsolete. The new standards have helped sales and the ComEd program has helped increase sales even more. |
| Great influence, customers can't make their own choices now so we sell them what the government dictates. |
| Dramatically improved our sales |
| There has been a general feeling of, I guess I don't have a choice any more. They don't hate the idea, they just wish they didn't have to do it, though they are cooperating |
| They are upgrading their equipment |
| They are not that happy, no one wants to spend a bunch of money to upgrade their systems. |

| Survey Question: How have recent changes in Federal T12 lamp standards affected your company's approach to selling high-efficiency T8 or T5 linear fluorescent lighting equipment? |
|---|
| **Response from Lighting Trade Allies that Participated in the EPY5 Standard Program (Based on 30 Interviews)** |
| Seem open to it positively |
| Some are very interested in changing immediately to not be caught behind their competition. |
| They are not reacting. They are more concerned with energy efficiency. |
| Most are not changing unless they have to. owners upgrade once buildings are vacant |
| Expensive to make change, complicated |
| Mixed reaction, some would like to stock pile, and some see benefit in doing project |
| Some know about it. Most noticed because of the price increase. The bulk of them are aware of the change, but they are not all changing. |
| Moving to other types because they are cost effective |
| They are upgrading to be more efficient. |
| Some are looking for retro fitting, others to hording. They want to use up what they have. |
| Not many, just a few are installing them, some like the change, some don't, 30% are still up in the air about the change he feels. |
| Some are willing to spend the money to upgrade, others aren't. |
| Not all respond well but after they do it they love it. |
| They seem to take it in their stride, I don't sense a lot of animosity. |
| The ones that are made aware, we are encouraging them to change. Some places just aren't changing. |

*Source: Interviews with 30 lighting trade allies that participated in the EPY5 Standard program, conducted September-October 2013.*

**Other NTG Findings**

The NTG ratios from EPY1 through EPY5 evaluation research on Standard Program participants are summarized in Table 7-19.

**Table 7-19. NTG Ratio and Relative Precision at a 90% Confidence Level - Overall**

| Program Year | Relative Precision ± % | Low | NTGR Mean | High |
|---|---|---|---|---|
| EPY1 | 9% | 0.62 | 0.67 | 0.74 |
| EPY2 | 6% | 0.69 | 0.74 | 0.78 |
| EPY3 | 5% | 0.69 | 0.72 | 0.76 |
| EPY4 | 5% | 0.67 | 0.70 | 0.73 |
| EPY5 (Adjusted for Free-ridership Only) | | | | |
| Lighting | 5% | 0.70 | 0.74 | 0.78 |
| Non-Lighting | 8% | 0.63 | 0.69 | 0.74 |
| EPY5 Spillover Adder | | | | |
| Lighting | 11% | 0.04 | 0.05 | 0.06 |
| Non-Lighting | 28% | 0.04 | 0.06 | 0.08 |

*Source: Evaluation analysis*

There were only 12 EPY5 participants in the sample of 63 (19%) who reported T12 lighting in their baseline. The participants reporting T12s in their baseline comprised 14% of the sampled ex ante lighting energy savings, and were distributed across size strata: three stratum 1 (large), four stratum 2 (medium), five stratum 3 (small) projects; and five building types (light industry, warehouse, office, retail, and miscellaneous). The weighted average NTGR for the T12 group (free-ridership only) was 0.74, which is the same value as the full EPY5 sample of 63 lighting projects.

In EPY5, a stratified sample of 64 non-lighting participants were interviewed and we obtained a NTG ratio (free-ridership only) of 0.69 at a relative precision of ± 8%. The non-lighting NTG ratios estimated prior to EPY5 were not significant at the 90/10 level.

The EPY5 research findings for NTG ratios for lighting (0.79, with spillover added) and non-lighting (0.75 with spillover) should be considered for future deeming.

## 7.3 Detailed Process Results

### 7.3.1 Sampling

A CATI telephone survey was implemented with a stratified random sample of Standard Program participants, resulting in 127 completed interviews, used for net-to-gross and process analysis.

To best support estimation of the net-to-gross ratio for the program, a stratified random sampling approach was employed for this survey. Projects were stratified first by end-use – lighting or non-lighting – and then energy savings, using the ex-ante energy impacts reported in the tracking database. Records were sorted from largest to smallest kWh claimed, and placed into one of three strata, such that approximately one-third of ex-ante savings fell into each size stratum.

The sampling unit for the CATI telephone survey was the unique program participant. When the sample was developed, there were 3,544 projects. Participants who completed a Standard project and either a Custom, gas, or BILD project were also removed from the sample for the Standard program survey (given the smaller population of Custom, gas, and BILD projects, those programs were given priority for calling overlapping project contacts). Participants that completed multiple projects had one project designated as the interview project, and then asked if the other projects were part of the same decision process. The final population for the CATI survey was 1,945 participants. We completed interviews with 127 participants (63 lighting, 64 non-lighting), which resulted in a precision level of better than +/- 10% for net-to-gross questions for lighting and non-lighting.

For the process analysis, survey weights were developed for the three size strata. These weights reflect the fact that not all strata were surveyed in proportion to their representation in the population. The following weights were applied to respondents in the three size strata:

**Table 7-20. Process Weights**

| Size Stratum | Population | Completes | Weight |
|---|---|---|---|
| 1 | 124 | 32 | 0.25 |
| 2 | 401 | 53 | 0.49 |
| 3 | 1420 | 42 | 2.21 |
| **TOTAL** | **1945** | **127** | |

*Source: Evaluation analysis*

### 7.3.2 Survey Disposition

Table 7-21 below shows the final disposition of the 1,945 unique contacts included in the original sample frame for the participant survey.

**Table 7-21. Sample Disposition for NTG and Process Analysis**

| Sample Disposition | Customers |
|---|---|
| Population of Unique Customers | 1,945 |
| Completed Survey | 127 |
| Not Dialed | 1,055 |
| Unable to Reach | 466 |
| Callback requested | 154 |
| Refusal | 41 |
| Phone Number Issue | 94 |
| Ended Interview Midway Through | 5 |
| Could not confirm measures or participation | 3 |
| *Response Rate* | *14%* |

*Source: Evaluation team*

Table 7-22 presents the comparison of business sectors for survey respondents and the overall population of participating projects.

**Table 7-22. Business Sector of Survey Respondents**

| Sector | Respondents (n=127) | Percentage | Population (N=3,544) | Percentage |
|---|---|---|---|---|
| Retail/Service | 7 | 6% | 934 | 26% |
| Office | 16 | 13% | 636 | 18% |
| Miscellaneous | 28 | 22% | 634 | 18% |
| Light Industry | 38 | 30% | 415 | 12% |
| Warehouse | 11 | 9% | 374 | 11% |
| Heavy Industry | 13 | 11% | 168 | 5% |
| Medical | 2 | 2% | 102 | 3% |
| Grocery | 3 | 2% | 79 | 2% |
| Hotel/Motel | 6 | 5% | 69 | 2% |
| Restaurant | 2 | 2% | 52 | 1% |
| College/University | 1 | 1% | 45 | 1% |
| K-12 School | 0 | 0% | 36 | 1% |

*Source: Program Tracking Database; results of CATI telephone survey.*

### 7.3.3 Participation Trends

In EPY5, the number of projects completed was 3,544 and in EPY4 it was 4,603. This represents a 23% year-over-year decrease. As participation decreased significantly so did the achieved ex-ante energy

savings; decreasing by about 21% from EPY4 to EPY5. The average project size decreased from 157,196 kWh in EPY4 to 74,011 kWh in EPY5; about a 50% drop. Specific observations:

- Hotel/Motel was the only sector that grew in total number of projects, with a 23% increase in year-to-year participation. All other sectors saw participation declines.
- The biggest year-over year decrease in energy savings was in the grocery sector, which saw participation decline by nearly 88%. Other large declines came from the Light industry (-73%) and Medical sectors (-72%).
- In terms of ex-ante gross energy savings, the highest contributors to the overall energy savings came from the Warehouse, Miscellaneous, and Light Industry categories.
- The largest average project size was seen in the Medical sector, with an average project size of about 144,000 kWh.

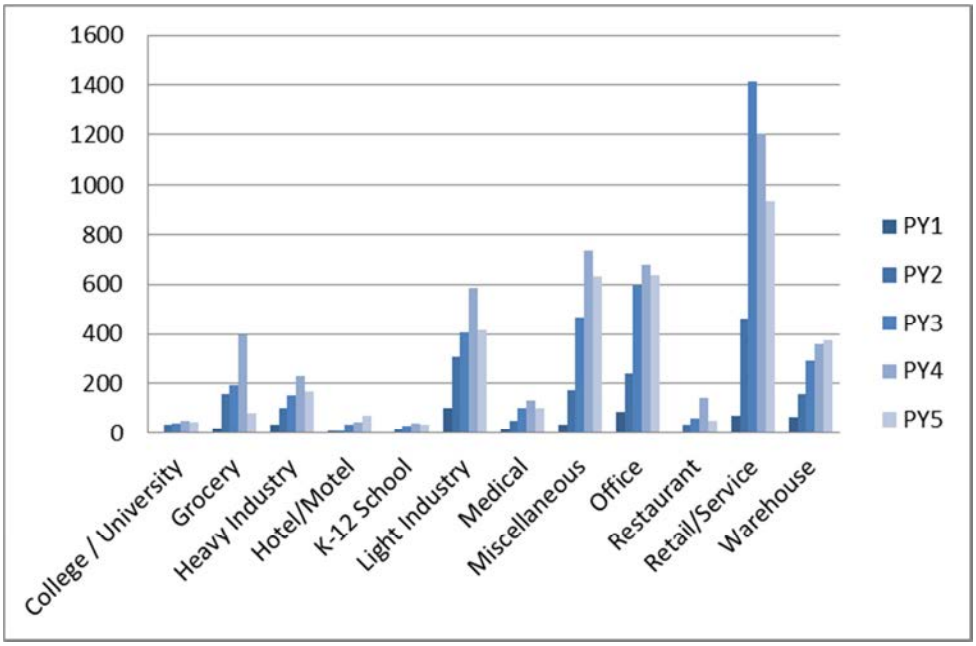
Table 7-23 and Figure 7-1 through Figure 7-4 compare the number of projects, participants, and ex-ante gross energy and peak demand saving by business sector and program year.

**Table 7-23. EPY5 Standard Projects and Ex-Ante Energy Savings and Peak Demand Reduction**

| Sector | Projects | | Ex-ante Gross Energy Savings | | kWh / Project | Ex-ante Gross Peak Demand Savings | |
|---|---|---|---|---|---|---|---|
| | # | % | kWh | % | | kW | % |
| College / University | 45 | 1% | 3,642,805 | 1% | 80,951 | 812 | 2% |
| Grocery | 79 | 2% | 5,344,777 | 2% | 67,655 | 610 | 1% |
| Heavy Industry | 168 | 5% | 22,501,286 | 9% | 133,936 | 3,599 | 9% |
| Hotel / Motel | 69 | 2% | 8,760,625 | 3% | 126,966 | 6,294 | 15% |
| K-12 School | 36 | 1% | 1,323,704 | 1% | 36,770 | 75 | 0% |
| Light Industry | 415 | 12% | 39,277,675 | 15% | 94,645 | 6,039 | 14% |
| Medical | 102 | 3% | 14,641,916 | 6% | 143,548 | 2,474 | 6% |
| Miscellaneous | 634 | 18% | 46,350,138 | 18% | 73,107 | 7,216 | 17% |
| Office | 636 | 18% | 38,739,648 | 15% | 60,911 | 6,136 | 15% |
| Restaurant | 52 | 1% | 645,077 | 0% | 12,405 | 113 | 0% |
| Retail/Service | 934 | 26% | 34,236,573 | 13% | 36,656 | 2,841 | 7% |
| Warehouse | 374 | 11% | 46,831,194 | 18% | 125,217 | 6,015 | 14% |
| TOTAL | 3,544 | | 262,295,417 | | 74,011 | 42,223 | |

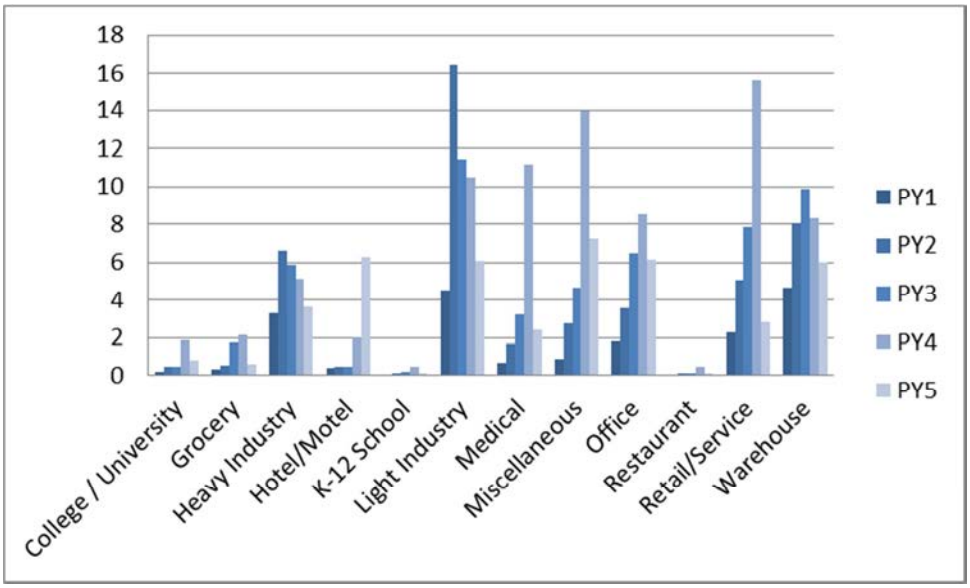
*Source: EPY5 Program Tracking Database, August 2, 2013 extract.*

**Figure 7-1. Number of Projects by Business Sector and Program Year**



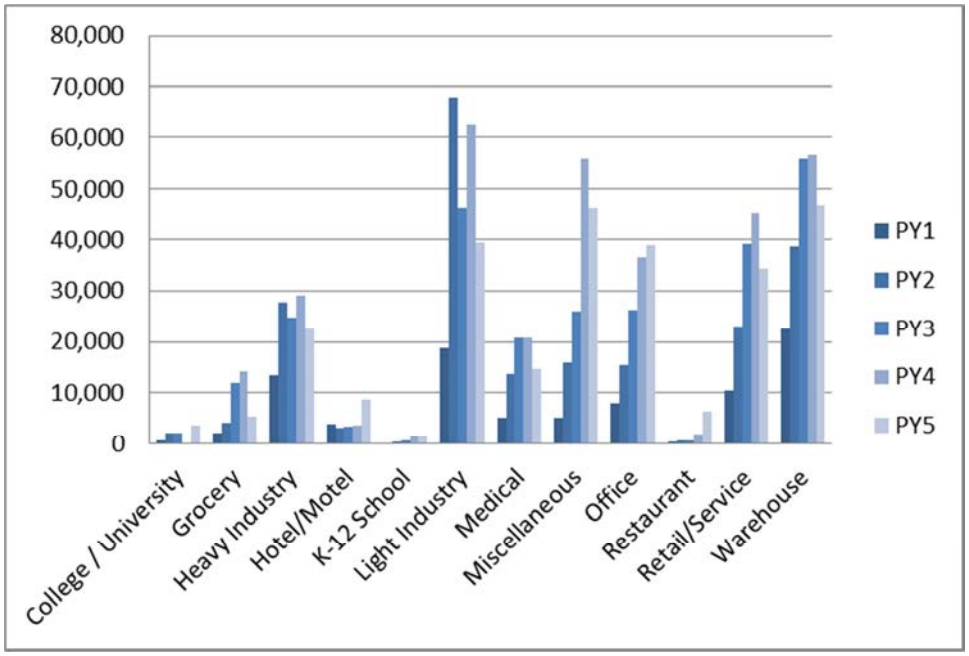

*Source: EPY5 Program Tracking Database, August 2, 2013 extract.*

**Figure 7-2. Ex-Ante Peak Demand Savings by Program Year (MW)**



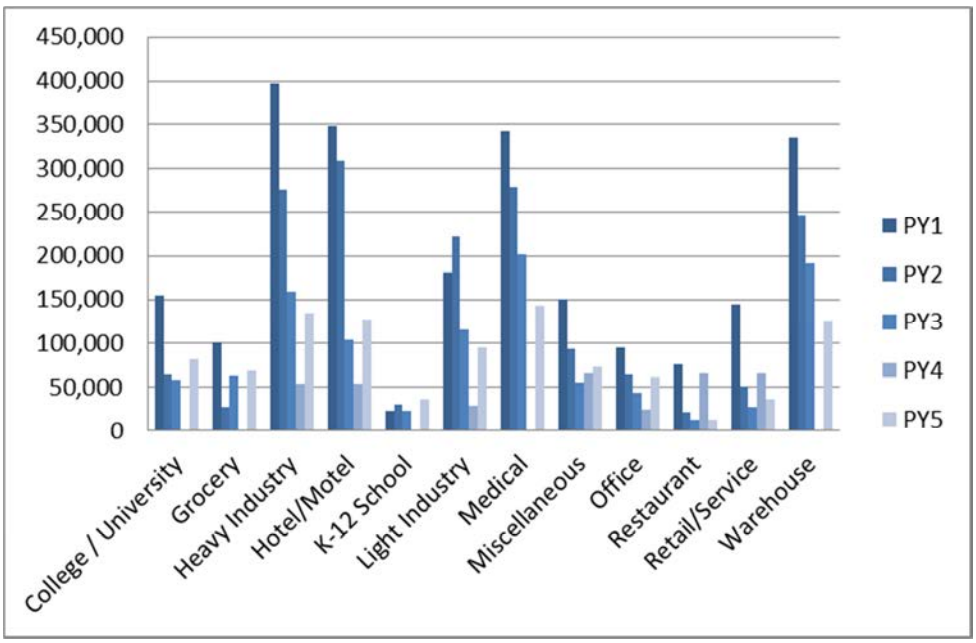

*Source: EPY5 Program Tracking Database, August 2, 2013 extract.*

**Figure 7-3. Ex-Ante Energy Savings by Year (MWh)**




*Source: EPY5 Program Tracking Database, August 2, 2013 extract.*

**Figure 7-4. Average Project Size by Year (kWh/project)**



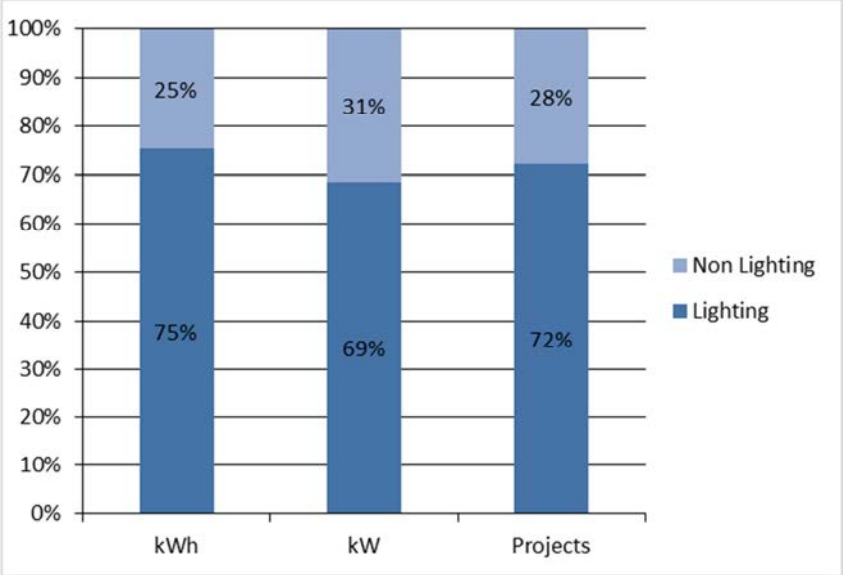

*Source: EPY5 Program Tracking Database, August 2, 2013 extract.*

**Participation by End Use**

In EPY5, the majority of projects (72%), ex-ante energy (75%) and ex-ante peak demand (69%) came from lighting. This is slightly less than in EPY4, where 85% of projects and 84% of ex-ante energy

came from lighting. However, the portion of ex-ante demand savings that came from lighting in EPY5 (69%) is somewhat larger than EPY4 (59%).

**Figure 7-5. Distribution of Projects and Ex-Ante Savings by End Use**




*Source: EPY5 Program Tracking Database.*

## 7.4 PJM Data and Findings

**Program Name and ComEd Program Year**
Business Standard Program, ComEd Program Year 2012 (EPY5)

**Ex-Post Gross Demand (MW) Savings**
The ex-post gross coincident peak demand savings was 42.4 MW.

**List parameters included in the ex-post gross demand calculation.**

- ***(a)*** **Non-coincident kW reduction**
- ***(b)*** **kW of baseline equipment**
- ***(c)*** **kW of replacement equipment**
- ***(d)*** **Coincidence Factor**
- ***(e)*** **Demand interactive effect**
- ***(f)*** **kW of baseline equipment during Performance Hours**
- ***(g)*** **kW of replacement equipment during Performance Hours**

For lighting measures, the algorithms used to calculate demand savings were:

- *(a) Non-coincident kW reduction = kW of baseline equipment - kW of replacement equipment*
- *(b) PJM Coincident kW reduction = non-coincident kW savings * Coincidence Factor * Demand interactive effect*

For non-lighting measures, the algorithms used to calculate demand savings were:

- *(c) PJM Coincident kW reduction = kW of baseline equipment during Performance Hours - kW of replacement equipment during Performance Hours*

**Include a brief explanation of the evaluation methodology used to derive ex-post gross demand savings for your program.**

The Standard program evaluation approach for demand savings verification followed the International Performance Measurement and Verification Protocol (IPMVP) Options (as referenced in PJM Manual 18B, Section 7) including *Option A: Partially Measured Retrofit Isolation/Stipulated Measurement, Option B: Retrofit Isolation / Metered Equipment* and other acceptable measurement and verification methodologies.

For lighting measures, Option A was employed, supplemented by other acceptable M&V methodologies, as described below. For non-lighting measures, Options A and B were employed.

The savings calculations are accomplished using methods that include short-term monitoring-based assessments, simulation modeling (e.g., DOE-2), bin models, application of ASHRAE methods and algorithms, analysis of pre- and post-installation billing and interval data, and other specialized algorithms and models. Customer-supplied data from energy management systems (EMS) or supervisory control and data acquisition (SCADA) systems are often used when available for onsite measurements.

Generally, the ex post impact evaluation incorporates the following methodologies:

a. Selection of a sample from the population of projects that meets the PJM requirements for statistical accuracy and precision as detailed in Manual 18B, Section 9 (the evaluation conducted on-site M&V at 42 sites in the program year 2012 (24 lighting and 18 non-lighting sites).
b. Develop a site-specific M&V plan for the representative sample of program projects. Each M&V plan details the data collection and analysis approach to be undertaken, following a careful review of relevant documents stored in ComEd's online tracking system.
c. Implement a site-specific data collection approach for each sampled project including verification that measures are installed and operational, and whether or not the as-built condition will generate the predicted level of savings.
d. Observed post-installation operating schedule and system loading conditions.
e. A thorough validation of baseline selection, including appropriateness of a retrofit baseline versus standard replacement on failure, to justify the use of the PJM "Current Load" baseline versus a "Standard Baseline".
f. Development of stipulated and measured engineering parameters that contribute to the impact calculations. Complete ex post engineering-based estimates of summer peak demand (kW) impact for each sampled project.
g. Prepare a detailed, site-specific impact evaluation report for each sampled site.
h. Carry out a quality control review of the ex post impact estimates and the associated draft site reports and implement any necessary revisions.

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

**Realization Rate on Demand Savings:**
Overall program realization rate on coincident peak demand savings: 1.00
Realization rate on coincident peak demand savings for lighting measures: 1.23
Realization rate on coincident peak demand savings for non-lighting measures: 0.51

**Precision Estimate on Demand Savings (90% confidence, two-tail):**
**Note: If precision estimate is not available, please provide the standard error for demand.**
Overall program precision estimate on coincident peak demand savings: 11% at 90% confidence, two tail.
Precision estimate on coincident peak demand savings for lighting measures: 12% at 90% confidence, two tail.
Precision estimate on coincident peak demand savings for non-lighting measures: 25% at 90% confidence, two tail.

**List parameters included in the precision estimate calculation – i.e., what are researched values, what are deemed values?**

**(a) Sample mean peak demand savings**
**(b) T-distribution score of samples**
**(c) Error bound around the sample mean**

The precision estimate is based on researched values of ex post coincident peak demand savings for the sample, the t-distribution values are based on research sample sizes, and the error bound is a calculated value.

**Peak Demand or Coincident Peak Demand:**
**Does your data track demand savings during a "peak" period, in addition to year-round? If so, please report the "peak" or "coincident-peak" demand savings.**
ComEd's program tracking database tracks the ex ante gross coincident peak demand savings. The ex-post gross coincident peak demand savings for the program year 2012 was 42.4 MW

**How is "peak demand" defined in your program or program tracking data?**
**If your data includes "peak" demand, please indicate how your program tracking data defines the program's "peak demand period" and the source of this data (i.e. program tracking database).**
ComEd's coincident peak demand savings for both baseline and post retrofit conditions are defined as the average demand kW savings for the EE Performance Hours (between the hour ending 15:00 Eastern Prevailing Time (EPT) and the hour ending 18:00 EPT during all days from June 1 through August 31, inclusive, of such Delivery Year, that is not a weekend or federal holiday.

If this savings measure is determined to have weather dependency then the coincident peak demand savings are based on the zonal weighted temperature humidity index (WTHI) standard posted by PJM. The zonal WTHI is the mean of the zonal WTHI values on the days in which PJM peak load occurred in the past ten years.

**What are the hours, days and months associated with the program tracking system's "peak demand period?" Is the peak demand period in your program's tracking data defined in the same way as PJM's peak demand period? PJM's peak demand period is 1-5 pm CT, non-holiday weekdays during June, July and August.**
The coincident peak demand period in the ComEd tracking database is defined between the hour ending 15:00 Eastern Prevailing Time (EPT) and the hour ending 18:00 EPT during all days from June 1 through August 31, inclusive, of such Delivery Year, that is not a weekend or federal holiday. This period is consistent with PJM peak demand period.

**Non-Peak Demand or Non-Coincident Peak Demand:**
**Does your data track demand savings throughout the year, regardless of whether the demand occurs during a "peak" period? If so, then it is "non-peak" demand or "non-coincident" peak demand savings.**
ComEd tracking data for demand savings reports the coincident peak demand reduction consistent with the PJM conditions as shown above.

## 7.5 Data Collection Instruments

**ComEd Business Standard EPY5 Participating Customer Survey**

**COMED SMART IDEAS FOR YOUR BUSINESS PROGRAM**

**PARTICIPANT SURVEY – BUSINESS STANDARD PROJECTS**

**EPY5 Final 8/30/2013**

**INTRODUCTION**
[READ IF CONTACT=1]
Hello, this is _____ from Opinion Dynamics calling on behalf of ComEd. This is not a sales call. May I please speak with <PROGRAM CONTACT>?
Our records show that <COMPANY> purchased <ENDUSE>, which was recently installed and received an incentive of $<INCENTIVE AMOUNT> from ComEd. When signing the application form, you also agreed to support evaluation efforts of the ComEd Smart Ideas for Your Business Program which includes participating in surveys like this one. I was told you're the person most knowledgeable about this project. Is this correct? [IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGABLE PERSON OR RECORD NAME & NUMBER.]
This survey will take about 20 minutes. Is now a good time? [If no, schedule call-back]
[READ IF CONTACT=0]
Hello, this is _____ from Opinion Dynamics calling on behalf of ComEd. I would like to speak with the person most knowledgeable about recent changes in cooling, lighting or other energy-related equipment for your firm at this location.
[IF NEEDED] Our records show that <COMPANY> purchased <ENDUSE>, which was recently installed and received an incentive of <INCENTIVE AMOUNT> from ComEd. When signing the application form, you also agreed to support evaluation efforts of the ComEd Smart Ideas for Your Business Program which includes participating in surveys like this one. I was told you're the person most knowledgeable about this project. Is that correct? [IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGABLE PERSON OR RECORD NAME & NUMBER.]

This survey will take about 20 minutes. Is now a good time? [If no, schedule call-back]

**SCREENING QUESTIONS**

S1 Which of the following statements best characterizes your relation to <COMPANY>?

1. (I am an employee of <COMPANY> (THIS CATEGORY SHOULD INCLUDE THE OWNER/PRESIDENT/PARTNER ETC. OF THE COMPANY.))
2. (My company provides energy-related services to <COMPANY>)
3. (I am a contractor and was involved in the installation of energy efficient equipment for this project)

00. (Other, specify) (PUT OWNER/PRESIDENT/PARTNER ETC. OF THE COMPANY IN 1)
98. (Don't know)
99. (Refused)

[READ if S1<>1] This survey asks questions about the energy efficiency upgrades for which <COMPANY> received an incentive at <ADDRESS>. Please answer the questions from the perspective of <COMPANY>. For example, when I refer to "YOUR COMPANY", I am referring to <COMPANY>. If you are not familiar with certain aspects of the project, please just say so and I will skip to the next question.

A1. Just to confirm, between June 1, 2012 and May 31, 2013 did <COMPANY> participate in ComEd's Smart Ideas for Your Business Program at <ADDRESS>? (IF NEEDED: This is a program where your business received an incentive for installing one or more energy-efficient products.)

1 (Yes, participated as described)
2 (Yes, participated but at another location)
3 (NO, did NOT participate in program)
00 (Other, specify)
98 (Don't know)
99 (Refused)

[SKIP A2 IF A1=1,2]

A2. Is it possible that someone else dealt with the energy-efficient product installation?

1 (Yes, someone else dealt with it)
2 (No)
00 (Other, specify)
98 (Don't know)
99 (Refused)

[IF A2=1, ask to be transferred to that person. If not available, thank and terminate. If available, go back to A1]

[IF A1=2,3,00,98,99: Thank and terminate. Record dispo as "Could not confirm participation".]

Before we begin, I want to emphasize that this survey will be primarily about the <END USE> you installed through the Smart Ideas for Your Business Program at <ADDRESS>.

A3. I'd like to confirm some information in ComEd's database. Our records show that you implemented the following <ENDUSE> measures through the Smart Ideas for Your Business Program. Is this correct?

[ASK A3a IF MEASD1 <> BLANK]

A3a <MEASD1>

1 (Yes)
3 (No, did not install)
8 (Don't know)
9 (Refused)

[ASK A3b IF MEASD2 <> BLANK]

A3b <MEASD2>

1 (Yes)
3 (No, did not install)
8 (Don't know)
9 (Refused)

[ASK A3c IF MEASD3 <> BLANK]

A3c <MEASD3>

1 (Yes)
3 (No, did not install)
8 (Don't know)
9 (Refused)

IF A3A=3,8,9 AND A3B=3,8,9 AND A3C=3,8,9: Thank and Terminate, Record Dispo as "Could Not Confirm Measures"

IF QA3A=1 OR 2 THEN MEAS1=1, IF QA3B=1 OR 2 THEN MEAS2=1, IF QA3C=1 OR 2 THEN MEAS3=1

## LIGHTING MODULE [ASK IF LIGHT=1, ELSE SKIP TO NON-LIGHTING MODULE]

PL1 Who was the most influential in identifying and recommending that you install the <ENDUSE> project you completed through the Smart Ideas Program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Owner)
8. (Supplier)
9. (ComEd representative/program staff)
10. (Project manager)
00. (Other, specify)
98. (Don't know)
99. (Refused)

PL2 And who informed you about the availability of an incentive through ComEd Smart Ideas Program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (ComEd Account Manager)
8. (owner/developer)
9. (project manager)
10. (Supplier)
11. (ComEd representative/program staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

## Measure Loop

[Loop 1: ASK IF MEAS1=1. Loop 2: ASK IF MEAS2=1. Loop 3: ASK IF MEAS3=1.]
[For Loop 2, replace "1" at the end of read-ins with "2"; for Loop 3, replace "1" with "3".]

[LMSR=1: LINEAR]
[LMSR=2: INTERIOR OTHER]
[LMSR=3: CONTROLS]
[LMSR=4: EXIT SIGNS]
[LMSR=5: DELAMP WITH LINEAR]
[LMSR=6: DELAMPING ONLY]
[LMSR=9: EXTERIOR]

[IF LMSR=3,5,9 SKIP TO NEXT LIGHTING MEASURE]

[IF LMSR=2,4 SKIP TO L9]

**REMOVED EQUIPMENT**

I'd like to ask you a few questions about the equipment that was removed when you installed the <MEASD1>…

[SKIP to L7a if LMSR=6]

L7 What type of lighting was removed when you installed <MEASD1> through the Smart Ideas for Your Business program? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]

- 1 Linear fluorescent lights
- 2 Metal Halide Fixtures
- 3 High Pressure Sodium Fixtures
- 4 Compact fluorescent lights
- 5 Incandescent bulbs
- 6 (Did not replace anything - new equipment)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK L7a IF L7=1 or LMSR=6]

L7a What type of linear fluorescent lights were removed? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]

- 1 High performance T8 lighting (1" diameter bulbs)
- 2 Standard performance T8 fluorescent lighting (1" diameter bulbs)
- 3 BLANK
- 4 T12 lighting (1.5" diameter bulbs)
- 5 T5 lighting (5/8" diameter)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK L8a-L8g IF L7a=4]

L8a Are you aware of the fact that federal standards for lighting equipment recently changed so that there are now restrictions on the production of T12 lamps for sale in the U.S?

1 Yes
2 No
00 (Other, specify)
98 (Don't know)
99 (Refused)

[Note: Energy Independence and Security Act (EISA) of 2007 raised standards for a variety of lamp types. For linear fluorescent lamps, new standards restrict the production of T12 lamps. New standards went into effect July 2012.]

L8b What are lighting contractors and suppliers telling you about these changes in federal standards?

1 Never mentioned Federal standard
00 Other (RECORD VERBATIM)
98 (Don't know)
99 (Refused)

[IF L8a=1, ASK L8c]

L8c Prior to participating in the program, did you consider trying to maintain your T12 system with spare or compliant T12 lamps and electronic T12 ballasts?

1 Yes
2 No
98 (Don't know)
99 (Refused)

L8d Were you experiencing a noticeable amount of failures in the T12 system due to aging T12 lamps?

1 Yes
2 No
98 (Don't know)
99 (Refused)

L8e Were you experiencing a noticeable amount of failures in the T12 system due to aging T12 ballasts?

1 Yes
2 No
98 (Don't know)
99 (Refused)

L8f Did you have any troubles finding replacement T12 lamps?

1 Yes

2 No
98 (Don't know)
99 (Refused)

L8g If you had not participated in the program, when would you have replaced your T12 lighting?

1 (Within one year)
2 (Between 1 and 2 years)
3 (2 or more years later)
8 (Don't know)
9 (Refused)

[SKIP L9 IF LMSR=9]

L9 Was the new lighting equipment installed in an air conditioned (cooled) space?

1. (Yes)
2. (No)
3. (Some of the lighting was and some wasn't)
8. Don't know
9. Refused

[ASK THE PY5 NET-TO-GROSS MODULE, THEN RETURN]

[ASK THE PY5 SPILLOVER MODULE, THEN RETURN]

## NON-LIGHTING MODULE [ASK IF NONLIGHT=1]

PNL1 Who was the most influential in identifying and recommending that you install the <ENDUSE> project you completed through the Smart Ideas Program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Owner)
8 (Project manager)
9. (ComEd Representative/Program Staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

PNL2 And who informed you about the availability of an incentive through ComEd Smart Ideas Program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (ComEd Account Manager)
8. (owner/developer)
9. (project manager)
11. (ComEd Representative/Program Staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK PY5 NET-TO-GROSS MODULE, THEN RETURN]

[ASK PY5 SPILLOVER MODULE, THEN RETURN]

# PY5 NET-TO-GROSS MODULE

*Variables for the net-to-gross module:*
<NTG> (B=Basic rigor level, S= Standard rigor level. All questions here are asked if the standard rigor level is designated. Basic rigor level is designated through skip patterns)
<UTILITY> (ComEd)
<PROGRAM> (Name of energy efficiency program)
<NTGENDUSE> (Type of measure installed; from program tracking dataset)
<VEND1> (Contractor who installed new equipment, from program tracking dataset)
<TECH_ASSIST> (If participant conducted Feasibility Study, Audit, or received Technical Assistance through the program; from program tracking database)
<OTHERPTS> (Variable to be calculated based on responses. Equals 1- minus response to N3p.)
<MSAME> (Equals 1 if same customer had more than one project of the same measure type; from program tracking database)
<NSAME> (Number of additional projects of the same measure type implemented by the same customer; from program tracking database)
<FSAME> (Equals 1 if same customer also had a project of a different measure type at the same facility; from program tracking database)
<FDESC> (Type of project of a different measure type at the same facility; from program tracking database)

## VENDOR INFORMATION

I would like to get some information on the VENDORS that may have helped you with the implementation of this equipment.

V1 Did you work with a contractor or vendor that helped you with the choice of this equipment?
- 1 (Yes)
- 2 (No)
- 8 (Don't Know)
- 9 (Refused)

[SKIP TO V4 IF V1=2, 8, or 9]

V3 Did you also use a DESIGN or CONSULTING Engineer?
- 1 (Yes)
- 2 (No)
- 8 (Don't know)
- 9 (Refused)

V4 Did your utility account manager assist you with the project that you implemented through the <UTILITY> <*PROGRAM*>?
- 1 (Yes)
- 2 (No, don't have a utility account manager)
- 3 (No, have a utility account manager but they weren't involved)
- 8 (Don't know)
- 9 (Refused)

## NET-TO-GROSS BATTERY

I'd now like to ask a few questions about the <NTGENDUSE> you installed through the program.

A2aa. Did this new energy efficiency equipment that you installed through the program replace existing equipment or was it added to control or work directly with existing equipment?

1 Replaced existing equipment
2 Added to control or work directly with existing equipment
3 Other (record VERBATIM)
8 (Don't know)
9 (Refused)

[SKIP ER1 IF A2aa=2,8,9]

ER1. Which of the following statements best describes the performance and operating condition of the equipment you replaced through the program?

1 Existing equipment was functioning without significant problems
2 Existing equipment was functioning, but it was obsolete
3 Existing equipment was functioning, but with significant problems
4 Existing equipment had failed or did not function
5 Not applicable, ancillary equipment (VSD, EMS, controls, etc.)

00 Other (RECORD VERBATIM)
98 (Don't know)
99 (Refused)

N00 In deciding to do a project of this type, there are usually a number of reasons why it may be undertaken. In your own words, can you tell me why you decided to implement this project? Were there any other reasons?

**DO NOT READ**

1 (To replace old or outdated equipment)
2 (As part of a planned remodeling, build-out, or expansion)
3 (To gain more control over how the equipment was used)
4 (The maintenance downtime and associated expenses for the old equipment were too high)
5 (Had process problems and were seeking a solution)
6 (To improve equipment performance)
7 (To improve the product quality)
8 (To comply with codes set by regulatory agencies )
9 (To comply with company policies regarding regular/normal maintenance/replacement policy)
10 (To get a rebate from the program)
11 (To protect the environment)
12 (To reduce energy costs)
13 (To reduce energy use/power outages)
14 (To update to the latest technology)
15 (To meet corporate goals or mandates)
00 (Other (RECORD VERBATIM))
98 (Don't know)
99 (Refused)

N1 When did you first learn about ComEd's Smart Ideas for your Business Program? Was it BEFORE or AFTER you first began to THINK about implementing the <NTGENDUSE> that was installed? (NOTE TO INTERVIEWER: "<NTGENDUSE>" refers to the specific energy efficient equipment installed through the program.)

1 (Before)
2 (After)
8 (Don't know)
9 (Refused)

[ASK N2 IF N1=2, 8, 9]

N2 Did you learn about ComEd's Program BEFORE or AFTER the decision was made to implement the <NTGENDUSE> that was installed? (NOTE TO INTERVIEWER: the "<NTGENDUSE>" refers to the specific energy efficient equipment installed through the program.)

1 (Before)
2 (After)
8 (Don't know)
9 (Refused)

N3 Next, I'm going to ask you to rate the importance of the program as well as other factors that might have influenced your decision to implement the <NTGENDUSE> that was installed. Think of the degree of importance as being shown on a scale with equally spaced units from 0 to 10, where 0 means not at all important and 10 means extremely important. Now using this scale please rate the importance of each of the following in your decision to implement the <NTGENDUSE> at this time. [FOR N3a-n, RECORD 0 to 10; 96=Not Applicable; 98=Don't Know; 99=Refused]

(If needed: How important in your DECISION to implement the project was…)

[SKIP N3a IF NTG=B]

N3a. The age or condition of the old equipment

N3b. Availability of the PROGRAM incentive

[ASK IF N3b=8, 9, 10]

N3bb. Why do you give it this rating? [OPEN END; 98=Don't know; 99=Refused]

[SKIP TO N3f IF NTG=B]

[ASK IF <TECH_ASSIST>=1, ELSE SKIP TO N3d]

N3c. Information provided through the technical assistance you received from ComEd or KEMA field staff

[SKIP N3cc IF NTG=B]

[ASK IF N3c=8, 9, 10]

N3cc. Why do you give it this rating? [OPEN END; 98=Don't know; 99=Refused]

[ASK N3d IF V1=1]

N3d. Recommendation from an equipment vendor or contractor that helped you with the choice of the equipment

N3e. Previous experience with this type of equipment

N3f. Recommendation from a ComEd or KEMA program staff person

[SKIP N3ff IF NTG=B]
[ASK N3ff IF N3f=8, 9, 10]
N3ff. Why do you give it this rating?

N3h. Information from Smart Ideas or ComEd marketing materials
[SKIP N3hh IF NTG=B]
[ASK IF N3h=8, 9, 10]
N3hh. Why do you give it this rating?

[SKIP TO N3k IF NTG=B]
[ASK N3i IF V3=1]
N3i. A recommendation from a design or consulting engineer

N3j. Standard practice in your business/industry
[SKIP N3k IF V4>1]
N3k. Endorsement or recommendation by a ComEd account manager
[SKIP N3kk IF NTG=B]
[ASK IF N3k=8, 9, 10]
N3kk. Why do you say that?

[SKIP TO N3n IF NTG=B]
N3l. Corporate policy or guidelines
N3m. Payback on the investment
N3n. Were there any other factors we haven't discussed that were influential in your decision to install the <NTGENDUSE>?
00 [Record verbatim]
96 (Nothing else influential)
98 (Don't Know)
99 (Refused)

[ASK N3nn IF N3n=00]
N3nn. Using the same zero to 10 scale, where 0 means not at all important and 10 means extremely important, how would you rate the influence of this factor? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

Thinking about this differently, I would like you to compare the importance of the PROGRAM with the importance of other factors in implementing the <NTGENDUSE> project.

[SKIP TO N3p IF NTG=B]

[READ IF (N3A, N3D, N3E, N3I, N3J, N3L, N3M, OR N3N)=8,9,10; ELSE SKIP TO N3p]
You just told me that the following other factors were important:
[READ IN ONLY ITEMS WHERE THEY GAVE A RATING OF 8 or higher]
(N3A) Age or condition of old equipment,
(N3D) Equipment Vendor recommendation
(N3E) Previous experience with this measure
(N3I) Recommendation from a design or consulting engineer

(N3J) Standard practice in your business/industry
(N3L) Corporate policy or guidelines
(N3M) Payback on investment
(N3N) Other factor

N3p If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <NTGENDUSE> that was installed, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?
Points given to program: [RECORD 0 to 100; 998=Don't Know; 999=Refused]

[CALCULATE VARIABLE "OTHERPTS" AS: 100 MINUS N3p RESPONSE; IF N3p=998, 999, SET OTHERPTS=BLANK]

N3o And how many points would you give to other factors? [RECORD 0 to 100; 998=Don't Know; 999=Refused] [The response should be <OTHERPTS> because both numbers should equal 100. If response is not <OTHERPTS> ask INC1]

INC1 The last question asked you to divide a TOTAL of 100 points between the program and other factors. You just noted that you would give <N3p RESPONSE> points to the program. Does that mean you would give <OTHERPTS> points to other factors?
1 (Yes)
2 (No)
98 (Don't know)
99 (Refused)

[IF INC1=2, go back to N3p]

## CONSISTENCY CHECK ON PROGRAM IMPORTANCE SCORE

[ASK IF (N3p>69 AND ALL OF (N3b, N3c, N3f, N3h, AND N3k)=0,1,2,3), ELSE SKIP TO N4aa]

N4 You just gave <N3p RESPONSE> points to the importance of the program, I would interpret that to mean that the program was quite important to your decision to install the <NTGENDUSE>. Earlier, when I asked about the importance of individual elements of the program I recorded some answers that would imply that they were not that important to you. Just to make sure I have recorded this properly, I have a couple questions to ask you.

N4a When asked about THE AVAILABILITY OF THE PROGRAM INCENTIVE, you gave a rating of ...<N3B RESPONSE> ... out of ten, indicating that the program incentive was not that important to you. Can you tell me why the incentive was not that important?
00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

[SKIP N4b IF NTG=B OR<TECH ASSIST>=0]

N4b When I asked you about THE INFORMATION PROVIDED THROUGH THE TECHNICAL ASSISTANCE, you gave a rating of ...<N3C RESPONSE> ... out of ten, indicating that the information provided was not that important to you. Can you tell me why the information provided was not that important?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N4c When I asked you about THE RECOMMENDATION FROM A <UTILITY> PROGRAM STAFF PERSON, you gave a rating of ...<N3F RESPONSE> ... out of ten, indicating that the information provided was not that important to you. Can you tell me why the information provided was not that important?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N4d When asked about THE INFORMATION from the <PROGRAM> or <UTILITY> MARKETING MATERIALS, you gave a rating of ...<N3H RESPONSE> ... out of ten, indicating that this information from the program or utility marketing materials was not that important to you. Can you tell me why this information was not that important?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

[SKIP N4e IF V4>1 or N3k=96,98,99]

N4e When asked about THE ENDORSEMENT or RECOMMENDATION by YOUR UTILTY ACCOUNT MANAGER, you gave a rating of <N3K RESPONSE> ... out of ten, indicating that this Account manager endorsement was not that important to you. Can you tell me why this endorsement was not that important?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

[ASK IF N3p<31 AND ANY ONE OF (N3b, N3c, N3f, N3h, OR N3k=8,9,10) ELSE SKIP TO N5]

N4aa You just gave <N3p 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 the <NTGENDUSE>. 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?

Now I would like you to think about the action you would have taken with regard to the installation of the <NTGENDUSE> that was installed if the utility program had not been available.

IF A2aa=1 (MEASURE=REPLACEMENT), THEN ASK:

N5 Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely", if the utility program had not been available, what is the likelihood that you would have installed exactly the same ENERGY EFFICIENT equipment? [RECORD 0 to 10; 98=Don't know; 99=Refused]

IF A2aa=2 (MEASURE=ADD-ON) THEN ASK:

N5aa Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely", if **PROGRAM** had **not** been available, what is the likelihood that you would have installed exactly the same item/equipment at the same time as you did? [RECORD 0 to 10; 98=Don't know; 99=Refused]

IF A2aa=1 (MEASURE=REPLACEMENT), THEN ASK:

Next, I'd like to ask a couple of questions to help us estimate at what point in the future you would definitely have replaced your existing equipment. We understand that you can't know exactly when you would have done this, especially so far into the future. We're just trying to get a sense of how long you think the current equipment or process would have kept serving your company's needs before you had to or chose to replace it.

N5ab. If the program had not been available, how likely is it that you would have replaced your existing equipment within **one** year of when you did? Would you have definitely, probably, equally likely or unlikely, probably not or definitely not replaced your existing equipment within one year of when you did? [Note to Interviewer: Read categories aloud to respondent]

1 (Definitely would have)
2 (Probably would have)
3 (Equally likely or unlikely)
4 (Probably not)
5 (Definitely not)
98 (Don't know)
99 (Refused)

IF N5ab=3,4,5 THEN ASK:

N5ac. In the absence of the program, how likely is it that you would have replaced your existing equipment within **three** years of when you did? [Note to Interviewer: Read categories aloud to respondent]

1 (Definitely would have)
2 (Probably would have)
3 (Equally likely or unlikely)
4 (Probably not)
5 (Definitely not)
98 (Don't know)
99 (Refused)

IF N5ac=3,4,5 THEN ASK:

N5ad. In the absence of the program, how likely is it that you would have replaced your existing equipment within **five** years of when you did? [Note to Interviewer: Read categories aloud to respondent]

1 (Definitely would have)

2 (Probably would have)
3 (Equally likely or unlikely)
4 (Probably not)
5 (Definitely not)
98 (Don't know)
99 (Refused)

N5ae. Now I would like you to think one last time about what action you would have taken if the program had not been available. Supposing that you had not installed the program qualifying equipment, which of the following alternatives would you have been MOST likely to do?

a. Install fewer units
b. Install standard efficiency equipment or whatever required by code
c. install equipment more efficient than code but less efficient than what you installed through the program
d. repair/rewind or overhaul the existing equipment
e. do nothing (keep the existing equipment as is)
f. something else (specify what _____)

## CONSISTENCY CHECKS

[ASK N5a-d IF N3b=8,9,10 AND N5=7,8,9,10]

N5a When you answered ...<N3B RESPONSE> ... for the question about the influence of the incentive, I would interpret that to mean that the incentive was quite important to your decision to install. Then, when you answered <N5 RESPONSE> for how likely you would be to install the same equipment without the incentive, it sounds like the incentive was not very important in your installation decision.

I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain the role the incentive played in your decision to install this efficient equipment?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N5b Would you like for me to change your score on the importance of the incentive that you gave a rating of <N3B RESPONSE> or change your rating on the likelihood you would install the same equipment without the incentive which you gave a rating of <N5 RESPONSE> and/or we can change both if you wish?

1 (Change importance of incentive rating)
2 (Change likelihood to install the same equipment rating)
3 (Change both)
4 (No, don't change)
8 (Don't know)
9 (Refused)

[ASK IF N5b=1,3]

N5c How important was… availability of the PROGRAM incentive? (IF NEEDED: in your DECISION to implement the project) [Scale of 0 to 10, where 0 means not at all important and 10 means extremely important; 98=Don't know, 99=Refused]

[ASK IF N5b=2,3]

N5d If the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment? [Scale of 0 to 10, where 0 means "Not at all likely" and 10 means "Extremely likely"; 98=Don't know, 99=Refused]

[ASK IF N3j>7]

N6 In an earlier question, you rated the importance of STANDARD PRACTICE in your industry very highly in your decision making. Could you please rate the importance of the PROGRAM, relative to this standard industry practice, in influencing your decision to install this measure. Would you say the program was much more important, somewhat more important, equally important, somewhat less important, or much less important than the standard practice or policy?

1 (Much more important)
2 (Somewhat more important)
3 (Equally important)
4 (Somewhat less important)
5 (Much less important)
8 (Don't know)
9 (Refused)

[ASK IF N5>0, ELSE SKIP TO N8]

N7 You indicated earlier that there was a <N5 RESPONSE or Changed N5 RESPONSE> in 10 likelihood that you would have installed EXACTLY the same ENERGY EFFICIENT equipment if the program had not been available. Without the program, when do you think you would have installed the <NTGENDUSE>? Would you say…

1 At the same time
2 Earlier
3 Later
4 (Never)
8 (Don't know)
9 (Refused)

[ASK N7a IF N7=3]

N7a. How much later would you have installed the <NTGENDUSE>? Would you say…

1 Within 6 months?
2 7 months to 1 year
3 more than 1 year up to 2 years
4 more than 2 years up to 3 years
5 more than 3 years up to 4 years
6 Over 4 years
8 (Don't know)
9 (Refused)

[ASK N7b IF N7a=6]

N7b. Why do you think it would have been over 4 years later?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

**PAYBACK BATTERY** [ASK N8-N10e IF N3m=8, 9,10]

I'd like to find out more about the payback criteria <COMPANY> uses for its investments.

N8 What financial calculations does <COMPANY> make before proceeding with installation of a MEASURE like this one?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N9 What is the payback cut-off point <COMPANY> uses (in months) before deciding to proceed with an investment? Would you say…

1 0 to 6 months
2 7 months to 1 year
3 more than 1 year up to 2 years
4 more than 2 years up to 3 years
5 more than 3 years up to 5 years
6 Over 5 years
8 (Don't know)
9 (Refused)

N10 Does your company generally implement projects that meet the required financial cut-off point?

- 1 (Yes)
- 2 (No)

8 (Don't know)
9 (Refused)

[ASK N10aa IF N10=2]

N10aa Why doesn't your company generally implement projects that meet the required financial cut-off point?

00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N10a Did the rebate (incentive) play a big role in moving your project within the acceptable payback cutoff point?

- 1 (Yes)
- 2 (No)

8 (Don't know)
9 (Refused)

**CORPORATE POLICY BATTERY** [ASK N11-N17 IF N3L= 8, 9,10]

N11 Does your organization have a corporate environmental policy to reduce environmental emissions or energy use? Some examples would be to "buy green" or use sustainable approaches to business investments.
1 (Yes)
2 (No)
8 (Don't know)
9 (Refused)

[ASK N12-N17 IF N11=1]
N12 What specific corporate policy influenced your decision to adopt or install the <NTGENDUSE> through the <UTILITY> program?
00 [RECORD VERBATIM]
98 (Don't know)
99 (Refused)

N13 Had that policy caused you to adopt <NTGENDUSE> at this facility before participating in the <UTILITY> program?
1 (Yes)
2 (No)
8 (Don't know)
9 (Refused)

N14 Had that policy caused you to adopt <NTGENDUSE> at other facilities before participating in the <UTILITY> Program?
1 (Yes)
2 (No)
3 (No other facilities)
8 (Don't know)
9 (Refused)
[ASK N15-N16 IF N13=1 OR N14=1]
N15 Did you receive an incentive for a previous installation of <NTGENDUSE>?
1 (Yes)
2 (No)
8 (Don't know)
9 (Refused)

[ASK N16 IF N15=1]
N16 To the best of your ability, please describe…. [Record VERBATIM; 98=Don't know; 99=Refused]

a. the amount of incentive received
b. the approximate timing
c. the name of the program that provided the incentive

[ASK N17 IF N13=1 OR N14=1]

N17 If I understand you correctly, you said that <COMPANY> 's corporate policy has caused you to install <NTGENDUSE> previously at this and/or other facilities. I want to make sure I fully understand how this corporate policy influenced your decision versus the <UTILITY> program. Can you please clarify that?
00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

**STANDARD PRACTICE BATTERY** [ASK N18-N22 IF N3j=8,9,10]

N18 Approximately, how long has use of <NTGENDUSE> been standard practice in your industry?
M [00 Record Number of Months; 98=Don't know, 99=Refused]
Y [00 Record Number of Years; 98=Don't know, 99=Refused]

N19 Does <COMPANY> ever deviate from the standard practice?
1 (Yes )
2 (No)
8 (Don't know)
9 (Refused)

[ASK IF N19=1]

N19a Please describe the conditions under which <COMPANY> deviates from this standard practice.
00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N20 How did this standard practice influence your decision to install the <NTGENDUSE> through the <PROGRAM>?
00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N20a Could you please rate the importance of the <PROGRAM>, versus this standard industry practice in influencing your decision to install the <NTGENDUSE>. Would you say the <PROGRAM> was…
1 Much more important
2 Somewhat more important
3 Equally important
4 Somewhat less important
5 Much less important

8 (Don't know)
9 (Refused)

N21 What industry group or trade organization do you look to establish standard practice for your industry?
00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

N22 How do you and other firms in your industry receive information on updates in standard practice?
00 [Record VERBATIM]
98 (Don't know)
99 (Refused)

## DESIGN ASSISTANCE

N23 Who provided the most assistance in the design or specification of the <NTGENDUSE> you installed through the <PROGRAM>? (If necessary, probe from the list below.)
1 (Designer)
2 (Consultant)
3 (Equipment distributor)
4 (Installer)
5 (<UTILITY> account manager)
6 (<PROGRAM> staff)
00 (Other, specify)
98 (Don't know)
99 (Refused)

[SKIP N24 IF N23=98, 99]
N24 Please describe the type of assistance that they provided.
00 Record VERBATIM
98 Don't know
99 Refused

## ADDITIONAL PROJECTS

[ASK N26 IF MSAME=1]
Our records show that <COMPANY> also received an incentive from <UTILITY> for <NSAME> other <NTGENDUSE> project(s).

N26 Was it a single decision to complete all of those <NTGENDUSE> projects for which you received an incentive from <UTILITY> or did each project go through its own decision process?

1 (Single Decision)
2 (Each project went through its own decision process)
00 (Other, specify)
98 (Don't know)
99 (Refused)

[ASK N27 IF FSAME=1 ELSE SKIP TO SPILLOVER MODULE]
Our records show that <COMPANY> also received an incentive from <UTILITY> for a <FDESC> project at < ADDRESS >.

N27 Was the decision making process for the <FDESC> project the same as for the <NTGENDUSE> project we have been talking about?

1 (Same decision making process)
2 (Different decision making process)
00 (Other, specify)
98 (Don't know)
99 (Refused)

# PY5 SPILLOVER MODULE

Thank you for discussing the new <ENDUSE> that you installed through the ComEd Smart Ideas Program. Next, I would like to discuss any energy efficient equipment you might have installed OUTSIDE of the program.

SP1 Since your participation in the ComEd program, did you implement any ADDITIONAL energy efficiency measures at this facility or at your other facilities within ComEd's service territory that did NOT receive incentives through any utility or government program?

1 (Yes)
2 (No)
8 (Don't know)
9 (Refused)

[ASK SP2 IF SP1=1, ELSE SKIP TO S0]

SP2 On a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Smart Ideas program influence your decision to install high efficiency equipment on your own? [SCALE 0-10; 98=Don't know, 99=Refused]

[SKIP IF SP2=DK/REF]

SP2a Why did you give it this rating? [OPEN END]

[ASK IF SP2>7, ELSE SKIP TO S0]

SP3 What was the first measure that you implemented? (IF RESPONSE IS GENERAL, E.G., "LIGHTING EQUIPMENT", PROBE FOR SPECIFIC MEASURE. PROBE FROM LIST, IF NECESSARY.)

1 (Lighting: T8 lamps)
2 (Lighting: T5 lamps)
3 (Lighting: Highbay Fixture Replacement)
4 (Lighting: CFLs)
5 (Lighting: Controls / Occupancy sensors)
6 (Lighting: LED lamps)
7 (Cooling: Unitary/Split Air Conditioning System)
8 (Cooling: Room air conditioners)
9 (Cooling: Variable Frequency Drives (VFD/VSD) on HVAC Motors)
10 (Motors: Efficient motors)
11 (Refrigeration: Strip curtains)
12 (Refrigeration: Anti-sweat controls)
13 (Refrigeration: EC motor for WALK-IN cooler/freezer)
14 (Refrigeration: EC motor for REACH-IN cooler/freezer)
00 (Other, specify)
96 (Didn't implement any measures)
98 (Don't know)
99 (Refused)

[SKIP TO S0 IF SP2=96, 98, 99]

SP4 What was the second measure? (IF RESPONSE IS GENERAL, E.G., "LIGHTING EQUIPMENT", PROBE FOR SPECIFIC MEASURE. PROBE FROM LIST, IF NECESSARY.)

1 (Lighting: T8 lamps)
2 (Lighting: T5 lamps)
3 (Lighting: Highbay Fixture Replacement)
4 (Lighting: CFLs)
5 (Lighting: Controls / Occupancy sensors)
6 (Lighting: LED lamps)
7 (Cooling: Unitary/Split Air Conditioning System)
8 (Cooling: Room air conditioners)
9 (Cooling: Variable Frequency Drives (VFD/VSD) on HVAC Motors)
10 (Motors: Efficient motors)
11 (Refrigeration: Strip curtains)
12 (Refrigeration: Anti-sweat controls)
13 (Refrigeration: EC motor for WALK-IN cooler/freezer)
14 (Refrigeration: EC motor for REACH-IN cooler/freezer)
00 (Other, specify)
96 (There was no second measure)
98 (Don't know)
99 (Refused)

SP5 I have a few questions about the FIRST measure that you installed. (If needed, read back measure: <SP3 RESPONSE>). Why did you purchase this equipment without the incentive available through the Smart Ideas program? [MULTIPLE RESPONSE, UP TO 3]

a.

1 (Takes too long to get approval)
2 (No time to participate, needed equipment immediately)
3 (The equipment did not qualify)
4 (The amount of the incentive wasn't large enough)
5 (Did not know the program was available)
6 (There was no program available)
7 (Had reached the maximum incentive amount)
00 (Other, specify)
98 (Don't know)
99 (Refused)

[ASK SP5a IF SP5=3, ELSE SKIP TO SP7]

SP5a Why didn't the equipment qualify? [OPEN END]

SP7. Thank you for sharing this information with us. We may have follow-up questions about the equipment you installed outside of the program. Would you be willing to speak briefly with a member of our team?

1 (Yes)
2 (No)

98 (Don't know)
99 (Refused)

# PROCESS MODULE

I'd now like to ask you a few general questions about your participation in the Smart Ideas for Your Business program.

### Program Processes and Satisfaction

[IF S1<>1 SKIP TO S1A]

S0 How did you first hear about the Smart Ideas program?

1. (ComEd Account Manager)
2. (ComEd Website)
4. (Contractor/Trade Ally)
5. (Email)
6. (Friend/colleague/word of mouth)
00. (Other, specify)
98. (Don't know)
99. (Refused)

S1a Did YOU fill out the application forms for the project? (Either the initial or the final program application)

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK S1b IF S1a=1 ELSE SKIP TO S1e]

S1b Did the application forms clearly explain the program requirements and how to participate?

1. (Yes)
2. (No)
3. (Somewhat)
8. (Don't know)
9. (Refused)

S1c How would you rate the application process? Please use a scale of 0 to 10 where 0 is "very difficult" and 10 is "very easy". [SCALE 0-10; 98=Don't know, 99=Refused]

[ASK S1d IF S1c<4]

S1d Why did you rate it that way?

1. (Difficult to understand)
2. (Long process)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S1e IF S1a=2]

S1e Who filled out the application forms for the project?

1. (Someone else at the facility)
2. (Someone else at the company)
3. (Trade Ally)
4. (Contractor)
5. (Supplier/Distributor/Vendor)
6. (Engineer)
7. (Consultant)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[IF S1=3, SKIP TO S8]

S4a Did you use a contractor for your <ENDUSE> project?

1. Yes
2. No
8. (Don't know)
9. (Refused)

[ASK S4b IF S4a=1]

S4b Was the contractor you used associated with ComEd's Smart Ideas for Your Business Program? (IF NEEDED: Was the contractor REGISTERED with the Smart Ideas for Your Business Program?)

1. Yes
2. No
8. (Don't know)
9. (Refused)

[ASK S5 IF S4a=1 ELSE SKIP TO S7]

S5 How would you rate the contractor's ability to meet your needs in terms of implementing your project? Please use a scale from 0 to 10, where 0 is "not at all able to meet needs" and 10 is "completely able to meet needs"? [SCALE 0-10; 98=Don't know, 99=Refused]

S6a Would you recommend the contractor you worked with to other people or companies?

1. Yes
2. No
8. (Don't know)
9. (Refused)

[ASK IF S6a = 2 ELSE SKIP TO S7]

S6b Why not?

1. (Too small)
00. (Other, specify)
98. (Don't know)
99. (Refused)

S7 How important is it to you that the contractor is trained in ComEd's Smart Ideas for Your Business application process and program incentives? Please use a scale from 0 to 10, where 0 is "not at all important" and 10 is "very important"? [SCALE 0-10; 98=Don't know, 99=Refused]

S8 During the course of your participation in the program, did you place any calls to the Smart Ideas for Your Business Call Center?

1. Yes
2. No
8. (Don't know)
9. (Refused)

[ASK S9 IF S8=1]

S9 On a scale of 0 to 10, where 0 is "very dissatisfied" and 10 is "very satisfied;" how would you rate your satisfaction with the Call Center's ability to answer your questions? [SCALE 0-10; 98=Don't know, 99=Refused]

[ASK S10 IF S9<4]

S10 Why did you rate it that way?

1. (Provided inconsistent information)
2. (Didn't understand the question)
3. (Hard to reach the right person/person with the answer)
00. (Other, specify)
98. (Don't know)
99. (Refused)

S11 On a scale of 0 to 10, where 0 is very dissatisfied and 10 is very satisfied, how would you rate your satisfaction with… [SCALE 0-10; 96=not applicable, 98=Don't know, 99=Refused]

a. the incentive amount
b. the communication you had with the Smart Ideas program staff
c. the measures offered by the program (If needed: this is the equipment that is eligible for an incentive under the program)
d. the Smart Ideas program overall
e. ComEd overall

[ASK S12a IF S11a<4]

S12a You indicated some dissatisfaction with the incentive amount, why did you rate it this way? [MULTIPLE RESPONSE; UP TO 3]

1. (Better rebates in other states)
2. (Too small)
3. (Equipment didn't qualify)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S12b IF S11b<4]

S12b You indicated some dissatisfaction with the communication you had with the Smart Ideas staff, why did you rate it this way?

1. (Provided inconsistent information)
2. (Didn't understand the question)
3. (Hard to reach the right person/person with the answer)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S12b IF S11c<4]

S12c You indicated some dissatisfaction with the measures offered by the Smart Ideas program, why did you rate it this way? [OPEN END; 98=Don't know, 99=Refused]

[ASK S12d IF S11d<4]

S12d You indicated some dissatisfaction with the Smart Ideas Program overall, why did you rate it this way?

1. (Not as easy as other states)
2. (No clear guidance)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S12e IF S11e<4]

S12e You indicated some dissatisfaction with ComEd overall, why did you rate it this way?

1. (Rates are too high)
2. (Took too long to get rebate)
3. (Poor customer service)

4. (Poor power supply/service)
00. (Other, specify)
98. (Don't know)
99. (Refused)

### Marketing and Outreach

[IF S1<>1, SKIP TO B1A]

MK0 I'm now going to ask you about several specific ways in which you might have seen or heard information about the Smart Ideas for Your Business program. Have you ever… [1=Yes, 2=No, 8=(Don't know), 9=(Refused)]

a. Received information about the program in your monthly utility bill?
b. Attended a ComEd customer event where the program was discussed?
c. Discussed the program with a ComEd Account Manager?
d. Discussed the program with a Contactor or Trade Ally?
e. Seen information about the program on the ComEd Website?
f. Received information about the program in an Email?
g. Heard about the program from a colleague, friend or family member?
h. Attended a meeting, seminar or workshop where the program was presented?
i. Attended a webinar where the program was discussed?
j. Read about the program in a ComEd Newsletter?
k. Been directly contacted by a ComEd or KEMA outreach staff?
l. Other [we've also run some ads in BOM magazine]

MK1b How useful were the program's marketing materials in providing information about the program? Would you say they were…

1. Very useful
2. Somewhat useful
3. Not very useful
4. Not at all useful
8. (Don't know)
9. (Refused)

[ASK MK1c IF MK1b=3,4]

MK1c What would have made the materials more useful to you? [MULTIPLE RESPONSE, UP TO 3]

1. (More detailed information)
2. (Where to get additional information)
00. (Other, specify)
98. (Don't know)
99. (Refused)

MK2 In general, what is the best way of reaching companies like yours to provide information about energy efficiency opportunities like the Smart Ideas for Your Business program? [MULTIPLE RESPONSE, UP TO 3]

1. (Bill inserts)
2. (Flyers/ads/mailings)
3. (e-mail)
4. (Telephone)
5. (ComEd Account Manager)
8. (Trade allies/contractors)
00. (Other, specify)
98. (Don't know)
99. (Refused)

### Benefits and Barriers

B1a What do you see as the main benefits to participating in the Smart Ideas for Your Business program? [MULTIPLE RESPONSE, UP TO 3]

1. (Energy Savings/Saving money)
2. (Good for the Environment)
3. (Lower Maintenance Costs)
4. (Better Quality/New Equipment)
5. (Rebate/Incentive)
9. (Able to make improvements sooner)
00 .(Other, Specify)
98. (Don't know)
99. (Refused)

B1b What do you see as the drawbacks to participating in the program? [MULTIPLE RESPONSE, UP TO 3]

1. (Paperwork too burdensome)
2. (Incentives not high enough/not worth the effort)
3. (Program is too complicated)
4. (Cost of equipment)
5. (No drawbacks)
00. (Other, specify)
98. (Don't know)
99. (Refused)

### Feedback and Recommendations

R1 Do you plan to participate in the program again in the future?

1. Yes
2. No
3. Maybe
8. (Don't know)
9. (Refused)

R2 How could the Smart Ideas for Your Business Program be improved? [MULTIPLE RESPONSE, UP TO 4]

1. (Higher incentives)
2. (More measures)
3. (Greater publicity)
4. (Better Communication/Improve Program Information)
8. (Simplify application process)
11. (Quicker processing times)
00. (Other, specify)
96. (No recommendations)
98. (Don't know)
99. (Refused)

## Firmographics

I only have a few general questions left.

F1 BLANK

F2 Which of the following best describes the ownership of this facility?
1. <COMPANY> owns and occupies this facility
2. <COMPANY> owns this facility but it is rented to someone else
3. <COMPANY> rents this facility
8. (Don't know)
9. (Refused)

F6 And which of the following best describes the facility? This facility is…
1. <COMPANY>'s only location
2. one of several locations owned by <COMPANY>
3. the headquarters location of <COMPANY> with several locations

F4a How old is this facility? [NUMERIC OPEN END, 0 TO 150; 998=Don't know, 999=Refused]

F5a How many employees, full plus part-time, are employed at this facility? [NUMERIC OPEN END, 0 TO 2000; 9998=Don't know, 9999=Refused]

[SKIP F7 IF F2=2]

F7 In comparison to other companies in your industry, would you describe <COMPANY> as…
1. A local company
2. A regional company
3. A national company
4. An international company
5. (Not applicable)
8. (Don't know)
9. (Refused)

**ComEd Business Standard EPY5 Participating Trade Ally Survey**

**Participating Lighting Trade Ally Survey for the ComEd Standard incentives program Evaluation**
**Final October 25, 2013**

Hello, this is _____ from Opinion Dynamics calling on behalf of ComEd. THIS IS NOT A SALES CALL. We are doing a brief survey with program allies who have been involved in projects supported by the ComEd Smart Ideas for Your Business Program.

We are interested in your experience with the program and the impact it may have had on your business. ComEd plans to use the information to improve the energy efficiency programs and services it offers to its business customers. Can I please speak with <sname>?

Would you be willing to speak with me for about 15 minutes? Is now a good time or is there a more convenient time when I could call back?

*[If sname not available]* Who might be the best person to speak with about your company's involvement in the Smart Ideas for Your Business Program?

*Alert interviewee that the call will be recorded.*
*Note that responses will remain confidential and only be reported in aggregate with other responses.*

## Screening

S1. Our records indicate that within the past year, your company either specified, sold, or installed energy efficient lighting equipment that qualified for incentives from ComEd's Standard incentives program (formerly the Prescriptive incentives program), and as a result, your company or a customer received an incentive payment from ComEd. Is that correct?
1. (Yes)
2. (No) [THANK AND TERMINATE]
98. (Don't Know) [ASK: Is there someone else within the Company who might be able to speak about your company's involvement in the Smart Ideas for Your Business Program? IF NOT, THANK AND TERMINATE]
99. (Refused) [THANK AND TERMINATE]

S3a. How many years have you worked with ComEd's Standard incentives program, formerly called the Prescriptive incentives program?
1. (Less than a year)
2. (One year)
3. (Two years)

4. (Three years)
5. (Four years)
6. (Five years or more)
98. (Don't know)
99. (Refused)

**Unaided Awareness**

UA1. On a scale of 0-10, with 0 being "not at all familiar" and 10 being "extremely familiar", how familiar are you with ComEd's Standard incentives program offerings for lighting equipment? [0-10, 98="Don't know," 99="Refused"]

**Customer Awareness**

CA5. For applicable projects, what percent of the time do you promote the Standard incentives program to your customers? [Numeric 0-100, 998=Don't know, 999=Refused]

[Ask if CA5 = less than 25%]

CA5a. Can you explain why you aren't able to promote the program more often?
00. (OPEN-END)
98. (Don't know)
99. (Refused)

CA7. In the last year, have you seen a customer decide to complete an eligible lighting project but choose not go through the ComEd Standard incentives program?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF CA7=1, ELSE SKIP TO SO1]

CA8. About how many projects have you seen this happen to in the last year?
[OPEN END NUMERIC]
998. (Don't know)
999. (Refused)

[ASK IF CA8 <> 0, 998, 999]

CA8a. Compared to lighting projects that do go through the program, how large, in terms of cost, are the eligible lighting projects that do not go through the ComEd Standard incentives program? Would you say the project costs are, on average:
1. Smaller than projects that go through the program
2. About the same size as projects that go through the program
3. Larger than projects that go through the program
8. (Don't know)
9. (Refused)

CA9. Why do you think those customers chose not to participate in the program?
[OPEN END]
98. (Don't know)
99. (Refused)

**Program Influence**

[MULTIPLE RESPONSE: PICK UP TO 3]

**PI1**. Please describe how ComEd's Standard incentives program has affected your work.

1. (Program has attracted more customers/generated more work/increased sales)
2. (Program has led firm to use/recommend more efficient or qualifying equipment)
3. (Program has provided knowledge/information about equipment/work practices/ the market)
4. (Incentives have saved customers money/impacted customer product choices/allowed us to up-sell)
5. (Program has changed the focus of our work/projects)
6. (Program has had a negative influence or firm is dissatisfied with incentives/information/approval process)
7. (Program has not affected work)
0. Other (Specify)
8. DON'T KNOW
9. REFUSED

**PI2**. I'm going to read a list of ways that ComEd may have influenced your work. For each one, please tell me how much influence ComEd's Standard incentives program has had on that aspect of your work. Please use a scale that ranges from 0-10 where 0 means "no influence" and 10 means "a great deal of influence". The first one is…[INSERT ITEM - RANDOMIZE]

a. The efficiency levels of the equipment you recommend to your customers
b. How you explain the benefits of energy efficient equipment to your customers
c. The methods or techniques you use to do your work
d. Encouraging manufacturers and distributors to stock higher efficiency equipment

[0-10, 98="Don't know," 99="Refused"]

**Spillover**

SO2. Before your involvement in ComEd's program, what percentage of your sales included high efficiency lighting equipment that now qualifies for an incentive from ComEd? [Numeric 0-100, 998=Don't know, 999=Refused]

SO3. Since your involvement in ComEd's program, what percentage of your sales now includes high efficiency lighting equipment that qualifies for an incentive from ComEd? [Numeric 0-100, 998=Don't know, 999=Refused]

SO4. Thinking about your sales of lighting equipment that qualifies for a ComEd incentive, in what percentage of those sales do customers actually receive an incentive from ComEd? [Numeric 0-100, 998=Don't know, 999=Refused]

[CREATE VARIABLE: 1-SO4=No_Inc]

SO5. Does this mean then that <No_Inc> percent of your sales of lighting equipment qualifies for the Standard incentives program but DOES NOT receive an incentive from ComEd?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

SO6. To the best of your knowledge, on a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did ComEd's program influence your sales of qualifying lighting equipment to these non-participating customers? [Numeric 0-10, 98=Don't know, 99=Refused]

**Future of the T12 Lighting Market**

FL1. I'd like to ask you a few questions about how you think the lighting market will be affected by changes in federal equipment standards. Recently, the Energy Independence and Security Act (EISA) of 2007 raised standards for a variety of lamp types. As of July 2012, new standards for linear fluorescent lamps restrict the production of T12 lamps.

a. How have these changes in standards affected your company's approach to selling high-efficiency T8 or T5 linear fluorescent lighting equipment?
[OPEN END]
95. (They have not changed our approach)
98. (Don't know)
99. (Refused)

b. On a scale of 0-10, with 0 being "not at all" and 10 being "extremely aware", how aware are businesses of the recently changed federal standards for T12 lighting ? [0-10, 98="Don't know," 99="Refused"]

c. How are businesses with T12 lighting systems reacting to changes in Federal lighting standards?
[OPEN END]
95. (They are not)
98. (Don't know)
99. (Refused)

d. On a scale of 0-10, with 0 being "not at all common" and 10 being "extremely common", how common is it for businesses with T12 lighting to maintain their T12 systems by taking these steps: [0-10, 98="Don't know," 99="Refused"]

1. Installing "compliant T12 lamps",
2. Installing electronic T12 ballasts
3. Installing stockpiled T12 lamps?

e. On a scale of 0-10, with 0 being "not at all important" and 10 being "extremely important", how important are the following factors in causing businesses to upgrade their T12 lighting systems: ? [0-10, 98="Don't know," 99="Refused"]

1. Excessive number of T12 lamp failures
2. Excessive number of T12 ballast failures
3. Cost of operating T12 lighting,
4. Poor lighting quality

f. How many years do you expect it will take before most non-compliant T12 lighting systems are changed out to T8's, T5s, or some other compliant lighting system? [NUMERIC OPEN END, 98="Don't know," 99="Refused']

## Firmographics

Last, I have a few general questions about your company.

F1. What is your business category? (Probe for: contractor, engineer, ESCO, equipment vendor, architect)

1. (Electrical Contractor)
2. (Engineering)
3. (ESCO or Energy Service Company)
4. (Equipment Vendor)
5. (Architect)
6. (Lighting Equipment Distributor)

00. (Other, please specify: _____)
98. (Don't know)
99. (Refused)

F2b. Approximately how many total commercial or industrial lighting projects does your company implement in a typical year? [NUMERIC, 1-9999]

F3. Would you consider your company to be local, regional, national, or international in size?

1. (Local)
2. (Regional)
3. (National)
4. (International)

8. (Don't know)
9. (Refused)

F4. What are the key business sectors your company serves? (Probe for light/heavy industry, retail, office, restaurant, etc.) (one to four sectors are acceptable answers)

1. (K-12 School)
2. (College/University)
3. (Grocery)
4. (Medical)
5. (Hotel/Motel)
6. (Light Industry)
7. (Heavy Industry)
8. (Office)
9. (Restaurant)
10. (Retail/Service)
11. (Warehouse)
15. (Property Management/Real Estate)
00. (Other, specify)
98. (Don't know)
99. (Refused)

F5. Finally, do you have any recommendations for ways in which the Standard incentives program could be improved?

00. (OPEN-END)
98. (Don't know)
99. (Refused)