



# **Small Business Energy Savings Program PY6 Evaluation Report**

**Final**

**Energy Efficiency / Demand Response Plan:  
Plan Year 6  
(6/1/2013-5/31/2014)**

**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 program year six (PY6)<sup>1</sup> Small Business Energy Savings (SBES) program, ComEd's primary energy efficiency program for small business customers. PY6 represents the program's third full year of operation.

The SBES program is designed to assist qualified ComEd non-residential customers to achieve electric energy savings by educating them about energy efficiency (EE) opportunities through on-site assessments conducted by trade allies and installation of no-cost direct-install (DI) measures.<sup>2</sup> Further savings were available to participating customers through incentives of 30 to 75 percent offered for select contractor-installed (CI) measures.

Key changes during PY6 included:

- Extension of an expanded role for trade allies, following the successful model of the PY5 geo-marketing pilot, to the full SBES program in PY6 with trade allies now performing the initial on-site assessments. In PY5 the implementation contractors performed the assessments.
- Shifting from the previous "one-and-done" approach to a model aimed at fostering an ongoing relationship between customers and trade allies to install recommended measures over an extended time-period.
- Shifting the Program from ComEd's Energy Efficiency Portfolio Standard (EEPS) portfolio to the Illinois Power Authority (IPA) portfolio in PY7 under Illinois' Public Utility Act Section 16-111.5B. Portions of the program, beyond the IPA targets, were claimed through the ComEd EEPS portfolio
- Separation of ComEd's SBES program from those of its natural gas company partners.<sup>3</sup>

### E.1. Program Savings

Table E-1 summarizes the electricity savings from the ComEd PY6 SBES program. These include net energy savings of 128,538 megawatt-hours (MWh) and net peak demand savings of 23.70 megawatts (MW).

<sup>1</sup> The PY6 program year began June 1, 2013 and ended May 31, 2014.

<sup>2</sup> No-cost direct-install measures include low-flow showerheads, faucet aerators, pre-rinse spray valves, vending machine controls, and compact fluorescent lamps (CFLs).

<sup>3</sup> Separation from the Nicor Gas Small Business program occurred following PY5, and separation from the Peoples Gas and North Shore Gas programs occurred at the end of PY6.

**Table E-1. PY6 Total Program Electric Savings for EEPS and IPA**

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings <sup>4</sup>	135,607	49.51	25.66
Verified Gross Savings	135,303	35.61	24.95
Verified Net Savings	128,538	33.83	23.70

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

Table E-2 and Table E-3 summarize the allocation of PY6 SBES electricity savings between the Energy Efficiency Portfolio Standard (EEPS) and Illinois Power Agency (IPA) portfolios.<sup>5</sup>

**Table E-2. PY6 Total Program EEPS Electric Savings**

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	64,083	29.47	11.87
Verified Gross Savings	63,739	16.99	11.47
Verified Net Savings	60,552	16.15	10.90

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

**Table E-3. PY6 Total Program IPA Electric Savings**

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	71,524	20.04	13.79
Verified Gross Savings	71,564	18.62	13.48
Verified Net Savings	67,986	17.68	12.80

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

## E.2. Program Savings by End-Use Category

Table E-4 summarizes PY6 SBES program savings by measure end-use category. Lighting measures continue to comprise the majority of program savings, achieving 127,896 MWh (99.5 percent) of verified net energy savings. The program achieved a 100 percent gross realization rate.

<sup>4</sup> Includes 1,879 MWh from 70 projects that were installed in PY6 but whose invoicing and paperwork were not completed until June-July 2014, as well as 204 MWh from 25 projects that were begun during PY5 were not completed until the first month of PY6.

<sup>5</sup> ComEd allocated 71,521 gross MWh to IPA based on the IPA budget, with the rest going to EEPS (ComEd PY6 Ex Ante Savings.xlsx, 8-05-2014, and correspondence from ComEd program manager). Navigant identified 71,524 gross MWh for IPA and 64,083 gross MWh for EEPS in the tracking data.

**Table E-4. PY6 Program Results by End-use**

Parameter	Unit	Lighting	Water Efficiency Device	HVAC	Refrigeration	Total
<b>Energy Savings</b>						
Ex Ante Gross Savings	(MWh)	134,980	93	9	525	135,607
Verified Gross Savings	(MWh)	134,628	122	9	544	135,303
Verified Net Savings	(MWh)	127,896	116	8	516	128,538
<b>Peak Demand Reduction</b>						
Ex Ante Gross Peak Demand Reduction	(MW)	25.48	0.17	0.01	<0.00	25.66
Verified Gross Peak Demand Reduction	(MW)	24.92	0.02	0.01	<0.00	24.95
Verified Net Peak Demand Reduction	(MW)	23.67	0.02	0.01	<0.00	23.7

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

\* A deemed value from the IL Stakeholder Advisory Group (SAG) consensus process "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>

### E.3. Program Volumetric Detail

As shown in Table E-5, the SBES program implemented 7,515 projects and 553,955 measures in PY6.

**Table E-5. PY6 Volumetric Findings Detail**

	Direct-Install	Contractor-Installed	Total
Total Implemented Projects	1,638	7,390	7,515*
Total Participant Customers	1,473	5,872	5,975**
Total Program Measures	12,432	541,523	553,955

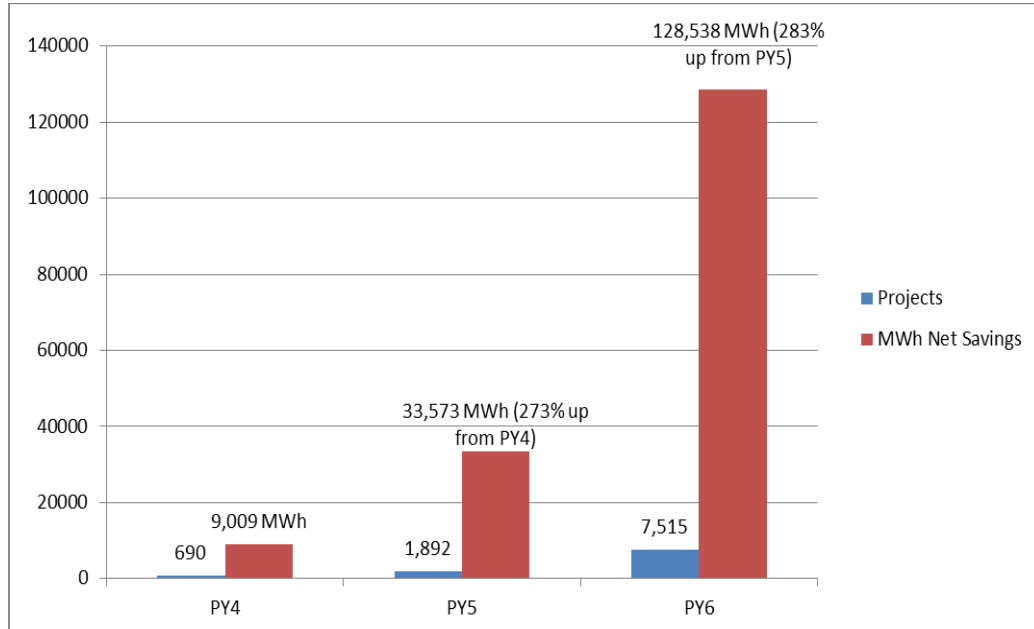
Source: ComEd tracking data and Navigant team analysis.

\* Unique projects: excludes 1,513 duplicate projects which had both CI and DI measures installed.

\*\* Unique customers: excludes 1,370 duplicate customer names with both CI and DI measures installed.

Participation and savings have both grown substantially since PY4, the first full year of operation, as shown in Figure E-1.

**Figure E-1. Year-over-Year Differences in SBES Program Participation and Savings**



Source: ComEd tracking data and Navigant team analysis.

#### E.4. Results Summary

The key metrics from the SBES program are summarized in Table E-6:

**Table E-6. PY6 Results Summary**

Participation	Units	PY6 Total
Net MWh Savings	MWh	128,538
Net Peak Demand Reduction	MW	23.77
Verified Gross MWh Savings	MWh	135,303
Gross Peak Demand Reduction	MW	24.95
Program Realization Rate	%	100%
Program NTGR*	#	0.95
Projects	#	7,515
Measures Installed	#	553,955
Customers Touched	#	5,975

Source: ComEd tracking data and Navigant team analysis.

\* A deemed value from the IL SAG consensus process "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>



## E.6. Key Findings and Recommendations

Overall, in PY6 the SBES program continued to grow rapidly, with program participation increasing by 297 percent, program measures increasing by 190 percent, and program verified net savings increasing by 283 percent from PY5.

- » **Verified Gross Impacts and Realization Rate**
  - **Finding 1.** The PY6 SBES program achieved 135,303 MWh of verified gross savings and 24.95 MW of verified gross peak demand savings with an overall verified gross realization rate of 100 percent for electricity savings. The program is accurately tracking gross savings for most measures with the exceptions noted below.
  - **Recommendation 1.** ComEd and the implementation contractor should update the tracking system default measure savings with adjustments to hours of use for religious worship location and others, and delta watts input assumptions. ComEd should include in the lighting measure description the delta-watts value used to derive the tracking savings, as well as total watts controlled for occupancy sensors.
- » **Peak Demand Reduction**
  - **Finding 2.** The SBES tracking system did not track demand savings, although the tracking system has an input field for demand that could be used. Navigant observed that the implementation contractor’s measure default savings spreadsheet calculated the PY6 measure demand savings.
  - **Recommendation 2.** ComEd and the implementation contractor should transfer demand savings estimates in the measure default savings spreadsheet to the tracking system to populate the demand savings input field.
- » **Verified Net Impacts & NTGR**
  - **Finding 3.** Navigant used deemed net-to-gross (NTG) ratio estimates from the Illinois SAG consensus process to calculate net verified savings for both EEPS and IPA measures.<sup>6</sup> PY6 IPA measures were not covered by the SAG NTG consensus decision. The evaluation determined that NTGR estimates for PY6 EEPS measures were appropriate to use for comparable PY6 IPA measures. Navigant plans to pursue NTG research in PY7 (June 1, 2014 to May 31, 2015) with the intent of having results available for prospective application in PY8 (June 1, 2015 to May 31, 2016). As trade allies have become the key channel for delivering the SBES program, ComEd together with the evaluation team should consider how best to structure this research so as to most accurately capture the Program’s changing structure.
- » **Program Volumetric Findings**
  - **Finding 4.** Navigant found projects in the tracking system database where some measures had negative quantities and savings, aggregating in some cases to negative

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<sup>6</sup> “ComEd PY5-PY6 Proposal Comparisons with SAG.xls,” available on the ILSAG website here: <http://ilsag.info/net-to-gross-framework.html>

overall savings. Nexant explained that “when errors or adjustments are found after a project has already been processed and batched; Nexant does not go back and change the project in the tracking system, but creates a subproject with the corrections”.

- **Recommendation 4.** While Navigant considers this to be primarily an issue of program internal checks and balances, we recommend that Nexant take additional care to avoid duplication, for example by including an additional field indicating which previous project/measure combination a new subproject is canceling or correcting.

## 1. Introduction

### 1.1 Program Description

The Small Business Energy Savings (SBES) program is designed to assist qualified ComEd non-residential customers to achieve electric energy savings by educating them about energy efficiency (EE) opportunities through the on-site assessments conducted by trade allies and the installation of no-cost direct-install (DI) measures.<sup>7</sup> Further savings were available to customers with incentives of 30 to 75 percent for select contractor-installed (CI) measures.

One key change to the SBES program in PY6 was a shift in the respective roles of the implementers and the trade allies. In previous years the initial customer contacts and walk-through assessments were conducted by energy advisors from the implementation contractors, who installed the DI measures and prepared a list of optional CI measures for each participant. The participant would schedule one or more subsequent visits from a participating trade ally to install any desired DI measures. In PY6, following the success of the PY5 Geo-Marketing Pilot, which was delivered entirely by trade allies<sup>8</sup>, the program expanded the role for the trade allies. At the same time, the philosophy of the program changed to place greater emphasis on fostering ongoing relationships between participating customers and the program's trade allies, reflecting financial constraints of small business owners that, in many cases, require the installation of CI measures to be spread out over an extended time period.

Another change from previous years was the separation of ComEd's SBES program from those of its gas company partners. Largely due to financial constraints on the gas company programs, the Nicor Gas Small Business program separated from the ComEd program prior to the start of PY6. The Peoples Gas and North Shore Gas Small Business Programs were still formally joint programs with the ComEd SBES program during PY6, but did not coordinate their operations and are not included in this report.

### 1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for PY6:

#### 1.2.1 Impact Questions

1. What is the level of gross and net annual energy savings induced by the program?
2. Did the Program meet its energy savings goals?
3. Are the assumptions and calculations used to calculate program savings in compliance with the current version of the Illinois Technical Reference Manual (TRM)? If not, what changes are required to bring them into compliance?

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<sup>7</sup> No-cost direct-install measures include low-flow showerheads, faucet aerators, pre-rinse spray valves, vending machine controls, and compact fluorescent lamps (CFLs).

<sup>8</sup> See Small Business Energy Savings Program Evaluation Report – ComEd and Nicor Gas, EPY5/GPY2 for a discussion of the geo-marketing pilot.



### **1.2.2 Process Questions**

Navigant did not pursue process or net-to-gross research on the SBES program in PY6.

## 2. Evaluation Approach

Navigant verified gross energy savings by reviewing the SBES program tracking system files for completeness and appropriate application of the TRM unit savings algorithms, supplemented by computer-assisted telephone interview (CATI) surveys of a sample of participating customers to verify the accuracy of tracking system data, assumptions and algorithms. To calculate the PY6 verified net energy savings values, Navigant applied the SAG consensus net-to-gross value of 0.95, which was based on research conducted during PY4, to the verified gross energy savings values.

### 2.1 Overview of Data Collection Activities

The core data collection activities included extraction and review of the program tracking database, in-depth interviews with the ComEd and Nexant SBES program managers, and surveying a random sample of participants to verify data from the tracking database. The full set of data collection activities is shown in the following tables.

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

What	Who	Target Completes	Completes Achieved	Comments
Program Tracking Database	Participants	Census	NA	
In-Depth Interviews	Program Manager/ Implementer Staff	2	2	Interviews w/ ComEd, Nexant project managers
Telephone Survey	Participants	70	70	CATI surveys of a representative sample during July-August 2014

Additional information used in the impact analysis included a supplementary comprehensive database of unit savings values and underlying work papers, as shown in Table 2-2.

**Table 2-2. Additional Resources**

Reference Source	Author	Application	Gross Impact	Process
ComEd_021914 Illinois Electric Master Measure Database.xlsx	ComEd	Measure lookup and unit savings review	X	
ComEd PY6 Measure Work papers 5-29-13.docx	ComEd	Measures not found in Illinois TRM v2.0	X	

## 2.2 Verified Savings Parameters

### 2.2.1 Verified Gross Program Savings Analysis Approach

Navigant estimated verified per-unit savings for each program measure using impact algorithm sources from the Illinois TRM v2.0 for deemed measures and evaluation research for non-deemed measures. The tracking data for the SBES PY6 evaluation came from ComEd’s Frontier tracking system and was extracted by Navigant on August 31, 2014. Navigant reviewed the SBES tracking system and procedures to verify that the program accurately reported measure counts. In addition, Navigant sourced ComEd’s SBES default measure lookup savings spreadsheet with the supporting ComEd work papers to verify input assumptions for other deemed or non-deemed measures. The spreadsheet enabled the evaluation team to verify the tracking inputs against the TRM. Navigant verified that the majority of the PY6 program savings were derived based on deemed values and algorithms from the TRM. Verified per-unit savings reflect evaluation adjustments to per-unit savings values based on Navigant measure review. The verified gross savings are the product of verified per-unit savings and verified measure quantities.

### 2.2.2 Verified Net Program Savings Analysis Approach

Navigant used the deemed net-to-gross (NTG) ratio estimate from the Illinois Stakeholder Advisory Group (IL SAG) consensus process to calculate net verified savings for EEPS measures. PY6 IPA measures were not covered by the SAG NTG consensus decision. The evaluation determined that NTG ratio estimates for PY6 EEPS measures were appropriate to use for comparable PY6 IPA measures. The deemed NTG ratio estimate of 0.95 was applied to both direct install and contractor installed projects.

Table 2-3 presents the key parameters and the references used in the verified gross and net savings calculations (energy and coincident peak demand).

**Table 2-3. Verified Savings Parameter Data Sources**

Verified Gross and Net Input Parameter	Value	Data Source	Deemed <sup>‡</sup> or Evaluated
NTGR – Direct Install & Contractor Installed*	0.95	IL SAG Spreadsheet <sup>‡</sup>	Deemed
Gross Realization Rate	100%	Program Tracking Data Review	Evaluated
All lighting measures delta watts	Vary	TRM, Sections 4.5	Deemed
DI & CI Lighting In-Service Rate	1.00	TRM, Section 4.5.1	Deemed
DI Showerhead In-Service Rate	0.98	TRM, Section 4.3.3	Deemed
DI Faucet Aerators In-Service Rate	0.95	TRM, Section 4.3.2	Deemed
HVAC/VSD Measure Inputs	Vary	ComEd Workpaper, TRM, Sections 4.4.8	Evaluated/ Deemed
Refrigeration Measures Inputs	Vary	ComEd Workpaper, TRM, Sections 4.6, ComEd Work Paper	Evaluated

<sup>‡</sup> From IL SAG consensus process “ComEd PY5-PY6 Proposal Comparisons with SAG.xls,” available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>

### **2.3 Process Evaluation**

No process evaluation was conducted of PY6 SBES program activities.

### 3. Gross Impact Evaluation

Navigant verified PY6 SBES program gross savings of 135,303 MWh, demand savings of 35.61 MW, and peak demand savings of 24.95 MW. The program’s verified gross realization rate was 100 percent. The methods used for gross savings verification included a tracking data review and an engineering review of per-unit measure savings for compliance with the TRM (Version 2.0 was used for PY6 evaluation except for measures with errata correction where the Illinois TRM Version 3.0 was used.)<sup>9</sup> We found that the program is accurately tracking gross savings for most measures.

#### 3.1 Tracking System Review

For the PY6 evaluation, ComEd provided a platform for the evaluation team to automatically and regularly download the MCEEP and other programs’ tracking data from the Frontier tracking system after ComEd had uploaded the data on the ComEd evaluation SharePoint site. Navigant downloaded the final data for the SBES program impact evaluation on August 31, 2014. Navigant reviewed the tracking data to verify the completeness and accuracy of the tracking system data and to identify any issues that would affect the impact evaluation of the program.

Key findings from the tracking system review include the following:

1. In our analysis we included only measures marked as “active” and projects in the tracking system data with install dates in PY6 (i.e., 6-01-2013 to 5-31-2014 inclusive). We excluded projects with StatusID values of 10, 20, and 100 (which indicate “Customer called to request site visit,” “Assessment is scheduled/rescheduled”, and “Cancelled,” respectively).<sup>10</sup>
2. We identified 70 projects that were installed in PY6 but had completed paper work a few weeks after the PY6 program had ended. There were 25 other projects that were also carried over. These projects were installed in the last quarter of PY5 but their invoices and paper work were completed within the first quarter of PY6. These 95 projects accounted for 2,083 MWh (2%) of PY6 ex-ante gross savings. Upon further discussion with Nexant, we determined that these projects should be included in PY6.<sup>11</sup>
3. The evaluation team applied adjustments to default unit savings for the following measures:
  - o We corrected errata in the bath and kitchen aerators savings assumptions using the TRM (V3). This resulted in increased measure savings.
  - o We found savings from some lighting measures (mostly HP/RW T8 retrofits, delamping, parabolic CFLs, LED Exit Signs, and Incandescent to LEDs) carried forward from ComEd

<sup>9</sup> Consensus from the Illinois TRM Technical Advisory Committee and the SAG indicated that changes should be made effective June 1, 2013. “Specifically, when a measure error was identified (in V2 TRM) and the TAC process resulted in a consensus, the measure is identified (in V3 TRM) as an ‘Errata’. In these instances the measure code indicates that a new version of the measure has been published, and that the effective date of the measure dates back to June 1st, 2013” (see page 10 of V3 TRM).

<sup>10</sup> We made this determination in consultation with the ComEd program manager on 8/8/2014.

<sup>11</sup> Telephone discussion with ComEd and Nexant SBES project managers on October 30, 2014.



PY5 Geo-Marketing Pilot program were based on PY5 savings assumptions. Upon further discussion with Nexant, we determined that depending on the kind and blended mix of the bulb types (delta watts) installed, the claimed savings were reasonable.

- We were unable to verify Nexant’s savings assumptions for occupancy sensors, due to lack of information in the tracking database of the total watts controlled or how savings per sensor were estimated. Upon further clarification from Nexant, we determined that no savings adjustment was needed.
- We found two different savings values were claimed for 2-Lamp 8ft T12 Slimline/HO- 4-Lamp 4ft T8 retrofits based on either 23.5 or 76.6 delta-watts assumption. For instance, a retail/service space has 137.5 kWh or 448 kWh savings; a restaurant space has either 115.7 kWh or 376 kWh savings. Most of these discrepancies were found in the Nexant territory. Upon further inquiry Nexant explained that mid-way through PY6 they were “not confident that Trade Allies were selecting the correct measure, Slimline versus HO/VHO. Hence Nexant determined the weighted average of these measures based upon PY4 and PY5 recommended versus installed quantities and applied that weighted average to the savings for a blended measure, combining [L09/L11] and [L10/L12]”. Navigant sought additional details and, following discussions with Nexant and ComEd program staff, concluded that the claimed savings were reasonable.<sup>12</sup>
- For other lighting measures such as LED Exit Signs, Navigant defaulted to ComEd’s delta watts values found in the *ComEd\_021914 Illinois Electric Master Measure Database spreadsheet* as the basis to verify the claimed savings.
- Navigant did not adjust the savings based on the building type, except for cases where we found that some of the lighting projects designated in the tracking database as miscellaneous building type were religious worship facilities. For these projects ComEd used either the miscellaneous or religious worship savings assumptions (e.g. projects SBES\_1627, SBES\_2924, and SBES\_2936). Navigant used the religious savings assumptions to calculate the verified savings. The savings for those measures were reduced. We also identified several other projects that were hospital or medical facilities but which had had the savings calculated using the miscellaneous building type. After further clarification with Nexant we adjusted the savings accordingly.
- Project# SBES\_004930 tracked one bathroom aerator but with claimed savings similar to cooling mixers (1,210 kWh). We adjusted the per-unit value to 137.5 kWh. Similarly, project# SBES\_005060 was tracked as an installed vending miser but with claimed savings appropriate for a cooler miser. We adjusted the per-unit savings from 1,210 kWh to 1,613 kWh. Others were project# SBES\_005778 which installed showerheads but the claimed unit savings (871 kWh) was twice the verified unit savings (436 kWh).
- We estimated the program demand savings from reviewing the *ComEd\_021914 Illinois Electric Master Measure Database spreadsheet*. We found that peak coincidence factor of 0.0004 was used to estimate peak demand savings for outdoor/exterior lighting. Navigant changed the value to zero per the TRM requirement.

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<sup>12</sup> Telephone discussion with ComEd and Nexant program managers on October 30, 2014.

Program Volumetric Findings Table 3-1 disaggregates the program volumetric findings by program delivery channel. The SBES program in PY6 implemented 7,390 projects and 553,955 measures (297% increase in projects and 190% increase in measures from PY5). The IPA program comprised 5,364 projects with 232,522 contractor installed measures. The EEPs program comprised 2,026 projects with 321,433 measures (12,432 direct install measures and 309,001 contractor installed measures).

**Table 3-1. PY6 Volumetric Findings Detail by Program Delivery Channel**

	Direct Install	Contractor Installed	Total
Total Implemented Projects	1,638	7,390	7,515*
Total Participant Customers	1,473	5,872	5,975**
Total Program Measures	12,432	541,523	553,955
Total Program Lighting Measures	11,466	541,449	552,915
Total Program Non-Lighting Measures	966	74	1,040
Average Program Measures/Project	8	73	74

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

\* Unique projects exclude duplicate projects with both CI and DI measures. There were 1,513 such projects.

\*\* Unique customers exclude duplicate customer names with both CI and DI measures. There were 1,370 such customers.

Table 3-2 below provides additional measure details for the direct install and the contractor installed measures. Navigant found some measures with negative quantities and savings, aggregating to make some projects with negative overall savings. Nexant explained that “when errors or adjustments are found after a project has already been processed and batched, Nexant does not go back and change the project in the tracking system, but [instead] creates a subproject with the corrections”.<sup>13</sup> Navigant did not adjust the reported measure quantities.

<sup>13</sup> Email correspondence with Nexant on 10-30-2014.

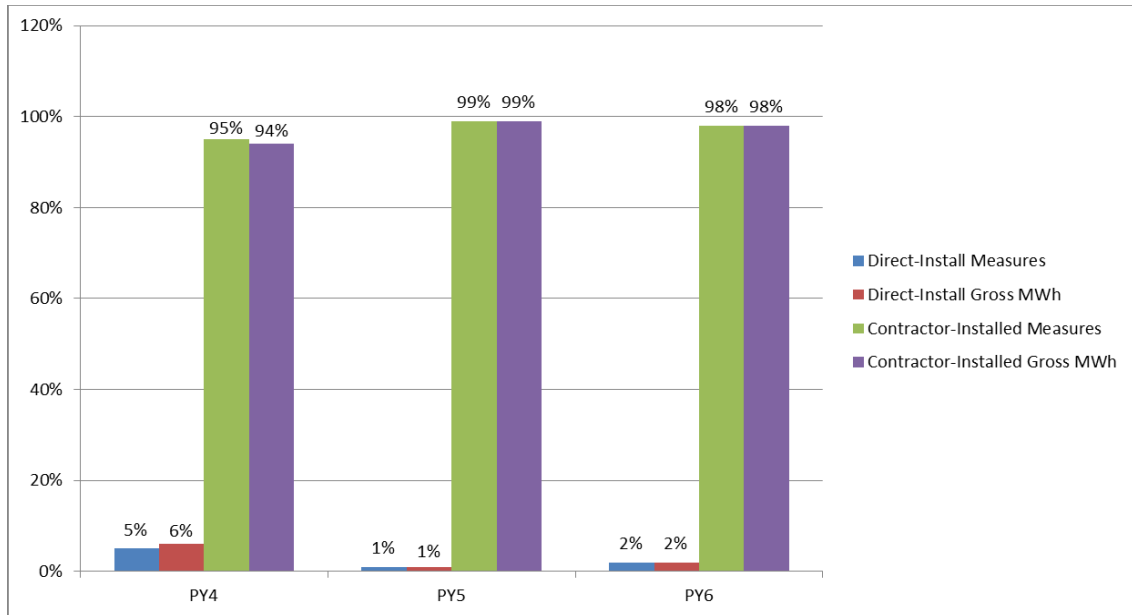
**Table 3-2. PY6 Volumetric Findings Detail**

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
CFLs (14W, 19W, 23W)	Each	Direct Install	11,446	11,446
Cooler Miser	Each	Direct Install	217	217
Showerheads	Each	Direct Install	28	28
Vending Miser	Each	Direct Install	148	148
Pre Rinse Sprayers	Each	Direct Install	17	17
Bath & Kitchen Aerators	Each	Direct Install	576	576
HPT8/LW Retrofit	Each	Contractor Install	158,841	158,841
Delamping T12 to HPT8/RWT8	Each	Contractor Install	107,785	107,785
LED Lamps	Each	Contractor Install	85,932	85,932
Occupancy Sensors	Each	Contractor Install	174,107	174,107
Exterior LED	Each	Contractor Install	2,338	2,338
Cold Cathode	Each	Contractor Install	678	678
Parabolic CFLs (15W & 23W)	Each	Contractor Install	2,595	2,595
LED Exit Sign	Each	Contractor Install	9,144	9,144
Metal Halide & HID	Each	Contractor Install	29	29
EC Motor, Walk-in & Reach-in	Each	Contractor Install	66	66
GREM - PTAC	Each	Contractor Install	8	8
<b>Total</b>			<b>553,955</b>	<b>553,955</b>

*Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)*

Figure 3-1 shows the distribution of measures installed by program delivery channel over the life of the program. Except in PY4 (the first year of the program) when DI measures accounted for 6 percent of gross energy savings, CI measures have accounted for 98-99 percent of total savings. Notably, lighting measures have also consistently dominated program savings, comprising roughly 99 percent of total energy savings since PY4 (not shown in figure).

**Figure 3-1. Relative Importance of Direct-Install vs. Contractor-Installed Measures**



Source: Evaluation Analysis

### 3.2 Gross Program Impact Parameter Estimates

Navigant estimated verified per-unit savings for each program measure using impact algorithm sources found in the TRM for deemed measures<sup>14</sup>, and using evaluation research for non-deemed measures. Navigant used ComEd’s SBES program default measure lookup savings spreadsheet<sup>15</sup> with the supporting ComEd work papers<sup>16</sup> to verify input assumptions for other deemed or non-deemed measures. Table 3-3 presents the key parameters and the references used in the verified gross and net savings calculations.

<sup>14</sup> Source: <http://www.ilsag.info/technical-reference-manual.html>

<sup>15</sup> ComEd\_021914 Illinois Electric Master Measure Database.xlsx

<sup>16</sup> ComEd PY6 Measure Workpapers 5-29-13.docx

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

Measure	Ex-Ante Gross Savings (kWh/unit)	Verified Gross Savings (kWh/unit)	Method*	Source
CFLs (14W, 19W, 23W)	Vary	Vary. Adjusted based on building type savings	Deemed	IL TRM v2.0, Section 4.5.8
Cooler Miser	1,210	1,210	Deemed	IL TRM v2.0, Section 4.5.1
Showerheads	436.1	436.1	Deemed	IL TRM v2.0, Section 4.5.2
Vending Miser	1,613	1,613	Deemed	IL TRM v2.0, Section 4.5.4
Pre Rinse Sprayers	Vary	Vary. Verified as acceptable	Deemed	IL TRM v2.0, Section 4.5.3
Bath & Kitchen Aerators	Vary (70, 92, etc.)	Corrected errata to 137.48	Deemed	IL TRM v3.0, Section 4.3.2
HPT8/LW Retrofit				
Delamping T12 to HPT8/RWT8				
LED Lamps				
Occupancy Sensors				
Exterior LED				
Cold Cathode				
Parabolic CFLs (15W & 23W)				
LED Exit Sign				
Metal Halide & HID	Vary	Verified as acceptable	Deemed	IL TRM v2.0, Section 4.5
EC Motor, Walk-in & Reach-in	411 or 392 for walk-in, and 345 for reach in	Verified as acceptable	Deemed	IL TRM v2.0, Section 4.6.4
GREM - PTAC	1,117	1,117	Evaluated	TRM/ComEd work papers

\* Deemed values are from TRM, available at <http://www.ilsag.info/technical-reference-manual.html>.

Table 3-4 presents the verified gross savings parameters and the verified realization rates on ex-ante gross savings for lighting and non-lighting measures and by program delivery channel. Verified gross realization rate is the ratio of verified gross savings to ex-ante gross savings from the program tracking system. Navigant applied verified measure quantities found in the program tracking system to verified unit measure savings values as displayed in Table 3-3 to calculate verified gross savings.

**Table 3-4. Verified Gross Savings Parameters**

Gross Savings Input Parameters	Value	Deemed* or Evaluated?
All Lighting Quantity	552,915	Evaluated
Non-lighting Quantity	1,040	Evaluated
Measure Type and Eligibility	Vary. All verified as acceptable	Evaluated
Gross Savings per Unit, Sampled Deemed Measures	Vary. See Table 3-3. Some adjustments applied	Deemed
Verified Realization Rate on Ex Ante Gross Savings (Overall)	100%	Evaluated
Verified Realization Rate on Ex Ante Gross Savings (Lighting)	100%	Evaluated
Verified Realization Rate on Ex Ante Gross Savings (Non-Lighting)	108%	Evaluated
Verified Realization Rate on Ex Ante Gross Savings (All Direct Install Measures)	96%	Evaluated
Verified Realization Rate on Ex Ante Gross Savings (Contractor Installed Measures)	100%	Evaluated

\* Deemed values are from Illinois TRM v2.0, available at <http://www.ilsag.info/technical-reference-manual.html>.

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract).

### 3.3 Verified Gross Program Impact Results

The ComEd PY6 SBES program reported ex-ante gross energy savings of 135,607 MWh. Evaluation adjustments described in the previous sections resulted in evaluation verified gross energy savings of 135,303 MWh, verified gross demand savings of 35.61 MW, and verified gross peak demand savings of 24.95 MW. The program achieved 100 percent gross realization rate on electricity savings. Table 3-5 presents the details of the verified savings, including the verified gross savings by program delivery channel and measure group.

As indicated in Figure 3-1 and elsewhere, savings from DI measures contributed 2,571 MWh (2%) of the Program's PY6 verified gross savings. The CI measures contributed 132,732 MWh (98%) of PY6 verified gross savings. Verified gross savings from all lighting measures were 134,628 MWh (99.5% of the PY6 gross savings), and verified gross savings from non-lighting measures were 675 MWh (0.5%). Additional measure breakdown and savings are presented below in Table 3-6.

**Table 3-5. PY6 Verified Gross Impact Savings Estimates by End-use**

Program Channel	Sample (90/10 Significance*)	Gross Energy Savings (MWh)		Gross Coincident Peak Demand Savings	
		Direct Install	Contractor Install	Direct Install	Contractor Install
<b>Lighting</b>					
Ex Ante Gross Savings	NA	2,080	132,900	0.54	24.93
Verified Gross Realization Rate**		93%	100%	88%	98%
Verified Gross Savings		1,931	132,697	0.48	24.43
<b>Lighting Sub-total</b>		<b>134,628</b>		<b>24.92</b>	
<b>Non-Lighting</b>					
Ex Ante Gross Savings	NA	592	35	0.17	0.01
Verified Gross Realization Rate**		108%	100%	13%	100%
Verified Gross Savings		640	35	0.02	0.01
<b>Non-lighting Sub-total</b>		<b>675</b>		<b>0.04</b>	
<b>Program Total Savings</b>					
Ex Ante Gross Savings	NA	135,607		25.66	
Verified Gross Realization Rate**		100%		97%	
<b>Verified Gross Savings</b>		<b>135,303</b>		<b>24.95</b>	

\* NA indicates that the TRM determines the gross savings.

\*\* Based on evaluation research findings

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

**Table 3-6. PY6 Verified Gross Impact Savings Estimates by Measure**

Measure	Ex Ante Gross Savings (MWh)	Ex Ante Demand Savings (MW)	Verified Demand Savings (MW)	Energy Realization Rate	Verified Gross Energy Savings (MWh)
CFLs (14W, 19W, 23W)	2,080	0.54	0.48	93%	1,931
Cooler Miser	263	-	-	100%	263
Showerheads	18	0.00	0.00	68%	12
Vending Miser	236	-	-	108%	255
Pre Rinse Sprayers	31	-	-	100%	31
Bath & Kitchen Aerators	44	0.17	0.02	179%	79
HPT8/LW Retrofit	59,368	10.94	10.74	100%	59,171
Delamping T12 to HPT8/RWT8	55,548	10.27	10.03	100%	55,575
LED Lamps	12,709	3.35	3.29	100%	12,694
Occupancy Sensors	900	0.04	0.04	100%	897
Exterior LED	1,773	0.00	0.00	98%	1,744
Cold Cathode	99	0.02	0.02	99%	98
Parabolic CFLs (15W & 23W)	424	0.11	0.11	98%	414
LED Exit Sign	2,068	0.19	0.19	101%	2,095
Metal Halide & HID	11	0.00	-	100%	11
EC Motor, Walk-in & Reach-in	26	0.00	0.00	100%	26
GREM - PTAC	9	0.01	0.01	100%	9
<b>Total</b>	<b>135,607</b>	<b>25.66</b>	<b>24.95</b>	<b>100%</b>	<b>135,303</b>

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)



## 4. Net Impact Evaluation

Navigant calculated the SBES program’s verified net savings to be 128,538 MWh, its verified net demand savings as 33.83 MW, and its verified net peak demand savings as 23.70 MW. These were allocated between the EEPS and IPA portfolios as follows: EEPS net energy savings of 60,552 MWh and net peak demand savings of 10.90 MW. IPA net energy savings of 67,986 MWh and net peak demand savings of 12.80 MW.

Table 4-1 presents verified net impact parameters. The NTGRs approved by the IL SAG consensus process for SBES PY6 EEPS measures were 0.95 for both lighting and non-lighting measures. PY6 IPA measures were not covered by the SAG NTG consensus decision. The evaluation determined that NTGR estimate for PY6 EEPS measures were appropriate to use for comparable PY6 IPA measures. Table 4-3, further below, summarizes the allocation of total electricity savings between the EEPS and IPA portfolios.

**Table 4-1. PY6 Verified Net Impact Parameters**

End-use	NTGR*	Source
Lighting	0.95	IL SAG
Non-lighting	0.95	IL SAG

\* Deemed through IL SAG consensus process “PY5-PY6 Proposal Comparisons with SAG.xls,” available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>

As indicated in the Table 4-2, the overall savings from DI measures was 2,442 MWh (2%) of the total SBES program net energy savings in PY6, whereas CI measures accounted for 126,096 MWh (98%) of the PY6 net savings. Net savings from all lighting measures accounted for 127,897 MWh (99.5%) of PY6 Program net savings, while net savings from non-lighting measures amounted to 641 MWh (0.5%). Navigant derived measure savings from the TRM and engineering analyses of program population-level data, so sample size and statistical significance are not applicable. The PY6 evaluation did not include new free-ridership or spillover research.

**Table 4-2. PY6 Verified Net Impact Savings Estimates by End-use for all Projects**

Program Channel	Gross Energy Savings (MWh)		Gross Coincident Peak Demand Savings (MW)	
	Direct Install	Contractor Install	Direct Install	Contractor Install
<b>Lighting</b>				
Ex Ante Gross Savings	2,080	132,900	0.54	24.93
Verified Gross Realization Rate**	93%	100%	88%	98%
Verified Gross Savings	1,931	132,697	0.48	24.43
NTG Ratio*	0.95	0.95	0.95	0.95
Verified Net Savings	1,834	126,062	0.46	23.21
<b>Non-Lighting</b>				
Ex Ante Gross Savings	592	35	0.17	0.01
Verified Gross Realization Rate**	108%	100%	13%	100%
Verified Gross Savings	640	35	0.02	0.01
NTG Ratio*	0.95	0.95	0.95	0.95
Verified Net Savings	608	33	0.02	0.01
<b>Program Total Savings</b>				
Ex Ante Gross Savings		135,607		25.66
Verified Gross Realization Rate**		100%		97%
Verified Gross Savings		135,303		24.95
NTG Ratio*		0.95		0.95
Verified Net Savings		128,538		23.70

\* Deemed through IL SAG consensus process "PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework-1.html>

\*\* Based on evaluation research findings

Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)

Table 4-3 summarizes the allocation of total electricity savings between the EEPS and IPA portfolios. The EEPS category realized net energy savings of 60,552 MWh and net peak demand savings of 10.90 MW. The IPA category realized net energy savings of 67,987 MWh and net peak demand savings of 12.80 MW.

**Table 4-3. PY6 Verified Net Impact Savings Estimates For IPA and EEPS Programs**

Savings Category	EEPS	IPA	Total
Verified Net Savings (MWh)	60,552	67,986	128,538
Verified Net Demand Savings (MW)	16.15	17.68	33.83
Verified Net Peak Demand Savings (MW)	10.90	12.80	23.70

*Source: Navigant analysis of ComEd tracking data (8-31-2014 data extract)*

Table 4-4 compares PY6 program details against those from PY4 and PY5.

**Table 4-4. Small Business Program Yearly Comparison**

Detail	PY4	PY5	PY6	Percent Growth PY5 to PY6
Participants (Projects)	690	1,892	7,515	+297%
Total Measures	27,842	190,808	553,955	+190%
Verified Net Savings (MWh)	9,009	33,573	128,538	+283%

*Source: Navigant analysis*

## 5. Process Evaluation

Navigant did not pursue process or NTG research for the SBES Program during PY6.

## 6. Findings and Recommendations

Overall, the SBES Program continued to grow in PY6, with program participation increasing by 297 percent, program measures increasing by 190 percent, and program verified net savings increasing by 283 percent from PY5.

### » Verified Gross Impacts and Realization Rate

- **Finding 1.** The PY6 SBES program achieved 135,303 MWh verified gross savings and 24.95 MW verified gross peak demand savings with an overall verified gross realization rate of 100 percent for electricity savings. The program is accurately tracking gross savings for most measures with the exceptions noted below.
- **Recommendation 1.** ComEd and the implementation contractor should update the tracking system default measure savings with adjustments to hours of use for religious worship location and others, and delta watts input assumptions. ComEd should include in the lighting measure description the delta watts used to derive the tracking savings, total watts controlled for occupancy sensors.

### » Peak Demand Reduction

- **Finding 2.** The SBES tracking system did not track demand savings, although the tracking system has an input field for demand that could be used. Navigant observed the implementation contractor's measure default savings spreadsheet calculated the PY6 measure demand savings.
- **Recommendation 2.** ComEd and the implementation contractor should transfer demand savings estimates in the measure default savings spreadsheet to the tracking system to update demand savings input data.

### » Verified Net Impacts & NTGR

**Finding 3.** Navigant used deemed net-to-gross ratio (NTGR) estimates from the Illinois Stakeholder Advisory Group (IL SAG) consensus process to calculate net verified savings for both EEPS and IPA measures.<sup>17</sup> PY6 IPA measures were not covered by the SAG NTG consensus decision. The evaluation determined that NTGR estimates for PY6 EEPS measures were appropriate to use for comparable PY6 IPA measures. Navigant plans to pursue NTG research in PY7 (June 1, 2014 to May 31, 2015) with the intent of having results available for prospective application in PY8 (June 1, 2015 to May 31, 2016). As trade allies have become the key channel for delivering the SBES program, ComEd together with the evaluation team should consider how best to structure this research so as to most accurately capture the Program's changing structure.

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<sup>17</sup> "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>

» **Program Volumetric Findings**

- **Finding 4.** Navigant found some measures with negative quantities and savings, aggregating to make some projects with negative overall savings. Nexant explained that “when errors or adjustments are found after a project has already been processed and batched, Nexant does not go back and change the project in the tracking system, but creates a subproject with the corrections”.
- **Recommendation 3.** While Navigant considers this as Nexant’s internal checks and balances, we recommend that additional care should be taken to avoid duplication as we found in an instance with project SBES\_2914 which was cancelled and corrected/re-created under project SBES\_2758, but both existed in the tracking system with savings.

## 7. Appendix

### 7.1 Evaluation Research Impact Approaches and Findings

#### 7.1.1 Evaluation Research Gross Impact Parameter Estimates

As described in Section 2, gross energy and demand savings for lighting measures are estimated using the following formula as specified in the TRM:

**Verified Gross Annual kWh Savings** = Program bulbs \* Delta Watts/1000 \* HOU \* IEe\* ISR

**Verified Gross Annual kW Savings** = Program bulbs \* Delta Watts/1000 \* ISR

**Verified Gross Annual Peak kW Savings** = Gross Annual kW Savings \* Peak Load CF \* IEd \* ISR

**Where:**

- Delta Watts = Difference between the Baseline Wattage and CFL Wattage
- HOU = Annual Hours of Use
- ISR = Installation Rate
- Peak Load CF = Peak Load Coincidence Factor is calculated as the percentage of program bulbs turned on during peak hours (weekdays from 1 to 5 p.m.) throughout the summer.
- IEe = Energy Interactive Effects
- IEd = Demand Interactive Effects

### 7.2 PJM Data and Findings

Small Business Energy Savings Program (SBES)  
 Program Year 6 (EPY6/GPY3) – June 1, 2013 – May 31, 2014

**Ex-Post Gross Peak Demand (MW) Savings**

The ex-post gross coincident peak demand savings was 24.95 MW.

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

- (a) PY6 program bulbs and HVAC measures installed
- (b) Non-coincident kW reduction
- (c) kW of baseline equipment
- (d) kW of replacement equipment
- (e) Coincidence Factor
- (f) Demand interactive effect
- (g) kW of baseline equipment during Performance Hours
- (h) 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*

ComEd's program tracking database is setup to track gross coincident peak demand savings. The ex-post gross coincident peak demand savings for the program year EPY6/GPY3 was 24.95 MW



### 7.3 Participant Survey Instrument

COMED SMALL BUSINESS ENERGY SAVINGS PROGRAM

PARTICIPANT SURVEY

PY6 FINAL (7/02/2014)

**Table 1: Small Business Energy Savings Program Survey Topics**

Topics	Research Questions
Measure Modules: 1) Direct Install Measures 2) Capital Investment Lighting Measures	<ul style="list-style-type: none"> <li>• Impact Direct Install Measure issues</li> <li>• Persistence</li> <li>• Hours of use</li> <li>• Tune-up baseline check</li> <li>• Early Replacement check</li> </ul>
Firmographics Module	<ul style="list-style-type: none"> <li>• Ownership</li> <li>• Type</li> <li>• Age</li> <li>• Number of employees</li> </ul>

**Measure1, Measure2, Measure3**

- CFL Parabolic
- Cold Cathode Lamp
- Delamping
- Delamping /Reflector
- DI CFL
- DI Cool Miser
- DI Low-Flow Aerator
- DI Low-Flow Bath Aerator
- DI Vending Miser
- EC Motor, Walk-In
- LED Exit Sign
- LED Exit Sign w/Battery
- LED PAR 38
- Occupancy Sensor
- Other LED
- Outdoor LED
- Screw-in LED

**INTRODUCTION**

[READ IF CONTACT=1]

Hello, this is \_\_\_\_\_ from Blackstone calling on behalf of ComEd *This is not a sales call.* May I please speak with **<PROGRAM\_CONTACT>**?

Our records show that **<COMPANY>** installed energy efficient equipment through the Small Business Energy Savings Program sponsored by ComEd. We are calling to do a follow-up study about **<COMPANY>**'s participation in this incentive program. I was told you're the person most knowledgeable about this project. Is this correct? **[IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGEABLE PERSON OR RECORD NAME & NUMBER.]**

This survey will take about 10 minutes. Is now a good time? **[IF NO, SCHEDULE CALL-BACK]**

[READ IF CONTACT=0]

Hello, this is \_\_\_\_\_ from Blackstone calling on behalf of ComEd. I would like to speak with the person most knowledgeable about the recent assessment and changes in lighting, cooling or other energy-related equipment for your firm at this location.

**[IF NEEDED]** Our records show that **<COMPANY>** installed energy efficient equipment such as **<MEASURE1>**, **<MEASURE2>**, and **<MEASURE3>**. We are calling to do a follow-up study about your firm's participation in this incentive program, which is called the Small Business Energy Savings Program. I was told you're the person most knowledgeable about this project. Is that correct? **[IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGEABLE PERSON OR RECORD NAME & NUMBER.]**

This survey will take about 10 minutes. Is now a good time? **[IF NO, SCHEDULE CALL-BACK]**

**SCREENING QUESTIONS**

A1. Just to confirm, did **<COMPANY>** recently participate in the Small Business Energy Savings Program offered by ComEd at **<ADDRESS>**?

**IF MORE EXPLANATION IS NEEDED:** This is a program where your business may have received a free energy assessment, an offer of free energy savings products, and a report.

- 1 Yes, participated as described
- 2 Yes, participated but at another location
- 3 NO, did NOT participate in program
- 97 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
- 97 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 INTRO]

[IF A1=2, 3, 97, 98, 99: Thank and terminate. Record disposition as “Could not confirm participation”.]

Before we begin, I want to emphasize that this survey will only be about the energy saving products and services received through the Small Business Energy Savings Program at **<ADDRESS>**.

[IF **<DIRECTINSTALL1=DI OR DIRECTINSTALL2=DI OR DIRECTINSTALL3=DI, ASK QA0-QA7** ASK QUESTION SET ONLY ONCE.]

### **Direct Install Measures**

QA0. Were you present when **<COMPANY>** was visited by a trade ally from the Small Business Energy Savings Program who conducted an assessment of your facility’s energy saving opportunities?

- 1. YES
- 2. NO
- 98. DON'T KNOW
- 99. REFUSED

QA1. I am going to read a list of energy saving products that our records indicate were installed in your facility or building. Please confirm whether the following products were installed during the energy assessment. Also let me know how many were installed.

No Cost Products	QA1			QA1_Num
	Yes, confirmed	No, not installed	DK/NA	If Yes, How many were installed? Range [0-50]
14 W CFLs				
19 W CFLs				
23 W CFLs				
Bathroom Faucet Aerators (electric)				
Kitchen Faucet Aerators (electric)				
Showerheads (electric)				
Pre-Rinse Sprayer				
Vending Miser				

QA2. Is (are) all of the free product(s) still installed in the original locations?

- 1. YES
- 2. NO
- 98. DON'T KNOW
- 99. REFUSED

**[IF QA2=2 Ask QA2a, ELSE SKIP TO QA7]**

QA2a. Which free products are currently not installed in their original locations?

[Show all products. If a respondent says "yes" to installing an product, then the interviewer needs to record how many they installed.] based on measures 1,2,3

	Yes, moved from original location	DK/NA	If yes, how many? Range (0 – 50)
14 W CFLs			
19 W CFLs			
23 W CFLs			
Bathroom Faucet Aerators (electric)			
Kitchen Faucet Aerators (electric)			
Showerheads (electric)			
Pre-Rinse Sprayer			
Vending Miser			

**For each measure mentioned in QA2a, ask QA3-QA6**

ASK Q3\_1 (QUESTION BELOW) UP TO THREE TIMES. NUMBER OF TIMES THE QUESTION IS ASKED IS DEPENDENT ON NUMBER OF TYPES OF MEASURES IN QA2A

QA3\_1 – QA3\_3 How many [answer from QA2a] were removed from their original locations (please be specific)? Range (0 – 50)

ASK QA4\_1 (QUESTION BELOW) UP TO THREE TIMES. NUMBER OF TIMES THE QUESTION IS ASKED IS DEPENDENT ON NUMBER OF TYPES OF MEASURES IN QA2A

QA4\_1- QA4\_3. What happened to the [answer from QA2a] that was removed? (INTERVIEWER: READ LIST AND RECORD ONE RESPONSE).

- 1. It is installed at some other location in the facility
- 72. It is in storage
- 3. It was sold or given away

- 4. It was thrown away
- 97. OTHER (SPECIFY)
- 98. DON'T KNOW
- 99. REFUSED

ASK QA5\_1 (QUESTION BELOW) UP TO THREE TIMES. NUMBER OF TIMES THE QUESTION IS ASKED IS DEPENDENT ON NUMBER OF TYPES OF MEASURES IN QA2A

QA5\_1-QA5\_3 Why [was/were] the **[answer from QA2a]** moved from [their/its] original locations? (DO NOT READ. RECORD ALL THAT APPLY. PROMPT IF NECESSARY)

- 1. Equipment failed
- 2. Didn't work properly
- 3. Wrong size – too small or too large
- 4. Low water flow
- 5. Didn't like the color
- 6. Didn't like the appearance/unattractive
- 97. Other, specify
- 98. Don't know
- 99. Refused

ASK QA6\_1 (QUESTION BELOW) UP TO THREE TIMES. NUMBER OF TIMES THE QUESTION IS ASKED IS DEPENDENT ON NUMBER OF TYPES OF MEASURES IN QA2A

QA6\_1 –QA6\_3 What did you replace the equipment with? (*Record/answer all that apply*)

- 1. A new high efficiency device
- 2. A less efficient device
- 3. Re-installed old equipment
- 4. Did not replace
- 97. OTHER (SPECIFY)
- 98. DON'T KNOW
- 99. REFUSED

**\*\*\*\*\* end of section on replacing equipment**

## Pre Rinse Sprayer

**[IF QA2A=Pre Rinse Sprayer, ASK QA7]**

- QA7. Hour many hours per day would you estimate the pre-rinse sprayer(s) is (are) used at this site?
1. About one half hour
  2. About one to two hours
  3. About 3 hours
  97. OTHER (SPECIFY)
  98. DON'T KNOW
  99. REFUSED

ASK QA8A THROUGH Q8C ONLY IF NO MEASURES WERE CONTRACTOR INSTALLED.

QA8a. Did the Energy Advisor recommend any energy efficient equipment you could install to reduce your energy usage?

1. YES
2. NO (SKIP TO A3 ON NEXT PAGE)
98. DON'T KNOW
99. REFUSED

QA8b. What energy efficient measures were recommended by the Energy Advisor? **(OPEN-END)**

QA8c. Why did you decide not to take any of these steps when a generous rebate was available? **(OPEN-END)**

**Capital Investment LIGHTING MODULE** **[ASK MODULE IF if LIGHTING1 or LIGHTING2 OR LIGHTING3 = 1**

**NOTE: THREE MEASURE VARIABLES ARE MEASURE1, MEASURE2 or MEASURE3.**

A3. I'd like to confirm some information in our database. Our records show that a contractor installed the following lighting equipment through the Small Business Energy Savings Program. Is this correct? **(ASK UP TO THREE MEASURES)**.

[Show all attributes. If a respondent says "yes" to installing an attribute, then the interviewer needs to record how many they installed.] based on measures1,2,3

Capital Investment Products- Data from Database	QA3		
	Yes, confirmed	No, not installed	DK/NA
CFL Bulbs			
Cold Cathode Lamp (s)			
T8 Lamp (s)			
Delamping			
Delamping w/Reflector			
PAR 38 LED(s)			
OTHER LED(s)			
Outdoor LED (s)			
LED Exit Sign(s)			
Parabolic CFL (s)			

If the respondent says, “NO, NOT INSTALLED” to any one of the three measures in A3, then **terminate**.

[ASK IF [DIRECTINSTALL1 =CI OR DIRECTINSTALL2 = CI OR DIRECTINSTALL3 =CI] AND [LIGHTING1=1 OR LIGHTING2 = 1 OR LIGHTING3=1]

A3a Our records show you installed <MEASURE1>? Is this correct?

- 1 YES
- 2 NO, DID NOT INSTALL
- 98 DON'T KNOW
- 99 REFUSED

[ASK PL3a IF A3a=1]

PL3a Is the lighting still installed?

- 1. YES
- 2. NO
- 98. DON'T KNOW
- 99. REFUSED

[ASK A3b IF MEASURE2 <> BLANK]

A3b Our records show you installed <MEASURE2>? Is this correct?

- 1 YES
- 2 NO, DID NOT INSTALL
- 98 DON'T KNOW
- 99 REFUSED

[ASK PL3b IF A3b=1]

PL3b Is the lighting still installed?

1. YES
2. NO
98. DON'T KNOW
99. REFUSED

[ASK A3c IF MEASURE3 <> BLANK]

A3c Our records show you installed <MEASURE3>? Is this correct?

- 1 YES
- 2 NO, DID NOT INSTALL
- 98 DON'T KNOW
- 99 REFUSED

[ASK PL3c IF A3c=1]

PL3c Is the lighting still installed?

1. YES
2. NO
98. DON'T KNOW
99. REFUSED

L4 After you completed the installation of the new fixtures, did you install additional lighting fixtures in that same space at a later time to increase the amount of lighting?

- 1 YES
- 2 NO
- 98 DON'T KNOW
- 99 REFUSED

[ASK IF L4=1, ELSE GO TO NEXT LIGHTING MEASURE]

L5 How many of these additional new fixtures did you install? [NUMERIC OPEN END, 1 TO 3000; 9998=Don't know, 9999=Refused]

**If PL3a=2 or PL3b=2 or PL3c=2, ask QA4 1-QA6 1 as appropriate:**

QA4\_1-QA4\_3. You mentioned that <MEASURE1/MEASURE2/MEASURE3> is no longer installed. What happened to the lighting equipment? **(Read list and record one response).**

1. It is installed at some other location in the facility
2. It is in storage
3. It was sold or given away



- 4. It was thrown away
- 97. OTHER (SPECIFY)
- 98. DON'T KNOW
- 99. REFUSED

QA5\_1-QA5\_3. Why [was/were] the lighting equipment moved from [their/its] original locations?  
*(Record/answer all that apply)*

- 1. Equipment failed
- 2. Didn't work properly
- 3. Didn't like the color
- 4. Didn't like the appearance/unattractive
- 97. OTHER, SPECIFY
- 98. DON'T KNOW
- 99. REFUSED

QA6\_1-QA6\_3. What did you replace the lighting equipment with?*(Record/answer all that apply)*

- 1. New high efficiency lighting
- 2. Less efficient lighting
- 3. Re-installed old equipment
- 4. Did not replace
- 97. OTHER, SPECIFY
- 98. DON'T KNOW
- 99. REFUSED

## HOURS OF USE – LIGHTING

Now we'd like to talk about the hours that your interior lighting equipment is in operation.

LH1a Are you typically open every day, Monday through Friday?

- 1 Yes
- 2 No
- 98 DON'T KNOW
- 99 REFUSED

*[ASK LH1b IF LH1a=2]*

LH1b How many days are you CLOSED Monday through Friday?

- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five
- 98 DON'T KNOW
- 99 REFUSED

[IF LH1b=5, SKIP TO LH4]

LH2 At what time do your indoor lights currently turn on during weekdays (Monday - Friday)?  
 (Enter 2400 for 24-hour operation, enter 0 for never on)  
 PROBE IF SCHEDULE AT ALL DIFFERS DURING WEEKDAYS  
 ALTERNATIVE SCHEDULE (SPECIFY)

[SKIP LH3 IF LH2=24hr or never]

LH3 At what time do your indoor lights currently turn off during weekdays (Monday - Friday)?  
 (Enter 2400 for 24-hour operation, enter 0 for never on)  
 PROBE IF SCHEDULE AT ALL DIFFERS DURING WEEKDAYS  
 ALTERNATIVE SCHEDULE (SPECIFY)

LH4 Does the lighting equipment operate on a different schedule on weekends (Saturday and Sunday)?

- 1 YES
- 2 NO
- 98 DON'T KNOW
- 99 REFUSED

[ASK IF LH4=1, ELSE SKIP TO LH9]

LH5 On Saturdays, at what time does the indoor lighting equipment turn-on? (Enter 2400 for 24-hour operation, enter 0 for never on)

[SKIP LH6 IF LH5=24hr or never]

LH6 And when does the indoor lighting equipment turn off on Saturdays? (Enter 2400 for 24-hour operation, enter 0 for never on)

LH7 And on Sundays, at what time does the indoor lighting equipment turn-on? (Enter 2400 for 24-hour operation, enter 0 for never on)

[SKIP LH8 IF LH7=24hr or never]

LH8 And when does the indoor lighting equipment turn off on Sundays? (Enter 2400 for 24-hour operation, enter 0 for never on)

LH8a Enter hours and minutes, e.g., 0530 for 5:30

- LH8b 1. AM
- 2. PM

LH9a During hours when your business is OPEN, approximately what percentage of the indoor lights are kept on? [NUMERIC OPEN END, 0 TO 100; 998=DON'T KNOW, 999=REFUSED]

[SKIP LH9b IF LH1a=1 AND LH2a = 2400 AND LH4 = 2] (Business is open 24/7)

LH9b During hours when your business is CLOSED, approximately what percentage of the indoor lights are kept on? **[NUMERIC OPEN END, 0 to 100; 998=Don't know, 999=Refused]**

LH10a Are there any months during the year when the operating schedule for the indoor lighting differs significantly from what you just described?

- 1 YES
- 2 NO
- 98 DON'T KNOW
- 99 REFUSED

**[ASK LH10b-e IF LH10a=1; ELSE SKIP TO non-lighting MODULE]**

LH10b How many hours per day does your indoor lighting typically operate during the periods with different operating schedules?

**[NUMERIC OPEN END, 0 TO 24; 98=DON'T KNOW, 99=REFUSED]**

LH10c And how many days per week?

**[NUMERIC OPEN END, 0 TO 7; 8=DON'T KNOW, 9=REFUSED]**

LH10d How many months per year does the equipment run on the alternative schedule? **[NUMERIC OPEN END, 0 TO 12; 98=DON'T KNOW, 99=REFUSED]**

LH10e During hours when your business is OPEN, on the alternative schedule, approximately what percentage of the indoor lighting is kept on? **[NUMERIC OPEN END, 0 TO 100; 998=DON'T KNOW, 999=REFUSED]**

**[SKIP LH10f IF LH10b = 24]**

LH10f During hours when your business is CLOSED on the alternative schedule, approximately what percentage of the indoor lights are kept on? **[NUMERIC OPEN END, 0 to 100; 998=Don't know, 999=Refused]**

## NON-LIGHTING MODULE

NL3. Our records show that you implemented an **EC Motor**. Is this correct?

NL3			NL3_Nu m
Yes, confirmed by customer	No, not installed/ implemented	DK/NA	If Yes, How many were installed?

**NL3=NO: Go To Firmographics Section**

- NL6 Did the **EC Motor** -replace an old or outdated Motor, or was it an addition of new equipment?
- 1 Addition of new motor - did not replace anything
  - 2 Replacement of old or outdated water heater
  - 97 OTHER, SPECIFY
  - 98 DON'T KNOW
  - 99 REFUSED

[SKIP NL7 NL8 AND NL9 IF NL6=1,98,99]

- NL7. Approximately how old was the existing motor?
- \_\_\_ Estimated Age in Years [RANGE 0-90]
- 98 DON'T KNOW
  - 99 REFUSED

IF RESPONDENT HAS TROUBLE ESTIMATING AGE OF EQUIPMENT, ASK:

- NL7a. In what year was the existing equipment purchased? (ESTIMATE IF DON'T KNOW)
- \_\_\_ Estimated Year of Purchase
- 98 DON'T KNOW
  - 99 REFUSED

- NL9. Which of the following statements best describes the performance and operating condition of the equipment you replaced?
- 1 Existing equipment was fully functional and without significant problems
  - 2 Existing equipment was fully functioning, but with significant problems
  - 3 Existing equipment had failed or did not function.
  - 4 Not applicable, ancillary equipment (VSD, EMS, controls, etc.)
  - 97 Other (RECORD VERBATIM)
  - 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
  - 98. Don't know
  - 99. 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
98. DON'T KNOW
99. REFUSED

F7a And which of the following best describes the ownership of the lighting system in this building?

1. My company owns the lighting system
2. The owner of the building owns the lighting system
97. OTHER (SPECIFY)
98. DON'T KNOW
99. REFUSED

F7b And which of the following best describes the ownership of the HVAC system in this building?

1. My company owns the HVAC system
2. The owner of the building owns the HVAC system
97. OTHER (SPECIFY)
98. DON'T KNOW
99. REFUSED

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]

TEXT2 That brings us to the end of my questions for you. On behalf of ComEd, we thank you for your time today. If in reviewing my notes, I discover a point I need to clarify, is it all right if I follow-up with you by phone or email? **[IF YES, VERIFY PHONE NUMBER OR EMAIL]**