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Energy Efficiency / Demand Response Plan: Plan Year 4 (6/1/2011-5/31/2012)

Evaluation Report: Midstream Incentives Lighting Program

FINAL

Presented to Commonwealth Edison Company

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Table of Contents

List of Figures and Tables

Figures:

Tables:

E.   Executive Summary

This report presents a summary of the findings and results from the evaluation of Commonwealth Edison's Midstream Incentives Lighting (MSI) program in Program Year 2012 (PY4).[1] The Non-Residential MSI Program provides incentives to increase the market share of qualified compact fluorescent lamps (CFL) sold to business customers. The MSI Program was launched as a pilot in PY3 (launched in October of 2010 but the bulk of sales did not begin until February 2011). The program was designed to provide an expedited, simple solution to business customers interested in purchasing efficient lighting by providing an instant discount at the point of sale. The program targeted distributors whose customer base is predominantly end users, as opposed to those mostly selling to contractors. As of the end of PY4, program bulbs had been sold through a total of 18 unique distributors,[2] which represents a significant increase from the four distributors enrolled as of the end of the PY3 pilot.

E.1   Evaluation Objectives

The primary objectives of the PY4 MSI Program are to: (1) Quantify PY4 gross and net program impacts; and (2) identify ways in which the program can be improved. The evaluation will also attempt to determine how the new Energy Independence and Security Act (EISA) 2007 standards are impacting non-residential customers' purchasing behavior.

E.2   Evaluation Methods

The primary data collection activities conducted as part of the PY4 MSI Program evaluation included a series of in-depth interviews with program managers, program implementers and program distributors. Computer-aided telephone interviews (CATI) were also conducted with a census of program participants for which contact information was made available to the evaluation team. Data collected during these interviews and surveys were essential in estimating gross and net savings parameters and in evaluating the program from a process point of view.

E.3   Key Impact Findings and Recommendations

Table E-1 below provides each of the parameters used to estimate the savings for the MSI Lighting Program, the source of these parameter estimates (all are evaluation based since MSI had no deemed parameter estimate in PY4) and the average parameter estimate across all PY4 bulb sales.

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[1] June 1, 2011 to May 31, 2012.

[2] Many of these 18 distributors sold program bulbs through multiple storefronts, and thus the total number of retail locations that sold program bulbs in PY4 was 75 based on program tracking data.

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Table E-1. Research Findings Gross and Net Savings Parameters

Gross Savings Input Parameters	Data Source	Average Value[3]
Program Bulbs	PY4 EM&V Program Tracking Data Analysis	575,252
Delta Watts	ES Lumen and bulb type mapping from ComEd Residential Lighting	50.6
Hours of Use (HOU)	Res – PY5 IL Residential TRM[4] NonRes – KEMA PY4 Operations Manual[5]	11.6
Peak Load Coincidence Factor	Res – PY5 IL Residential TRM NonRes – KEMA PY4 Operations Manual	0.61
Energy Interactive Effects	Res – PY4 Analysis NonRes – KEMA PY4 Operations Manual	1.13
Demand Interactive Effects	Res – PY4 Analysis NonRes – KEMA PY4 Operations Manual	1.32
Installation Rate	PY4 End User Surveys	73%
Leakage	PY4 End User Surveys	0.2%
NTGR	PY4 End User Surveys	0.63

Source: Evaluation Team Analysis

Table E-2 below provides the PY4 Gross and Net Research Findings Savings estimates for the Midstream Incentives Program. Since this program is in its first full year of operation, there were no deemed savings estimates. As the table below shows this program exceeded both its net and gross goals by 39% and 13%, respectively.

Table E-2. PY4 Research Findings Savings Estimates

Savings Estimate	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Unadjusted Gross	108,783	-	-
Ex Ante Net	45,689	-	-
Unadjusted Research Findings Gross	123,414	29.1	17.8
Research Findings Gross	101,230	21.1	17.0
Research Findings Net	63,358	13.2	10.7

Source: Evaluation Team Analysis

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[3] A number of the parameters (such as delta watts) taken on different values by bulb type. The value presented here is the average across all PY4 bulb types sold.

[4] The Illinois TRM was developed through a joint effort of all the members of the Illinois Stakeholder Advisory Group and is filed for approval by the Illinois Commerce Commission as of the filing of this report as a jointly agreed to TRM.

[5] KEMA. *Appendix A* of the *KEMA Operations Manual*. Prepared for Commonwealth Edison Company, August, 2009.

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The following list summarizes the key impact findings and recommendations from the study:

- **Tracking Data Issues:**
  Finding. Tracking data is missing for several key elements necessary for program impact estimation and evaluation.
  Recommendation. In PY5, a requirement for participation in the Midstream Incentives Program is for each lighting distributor to provide detailed customer contact information along with the program sales data. This information will greatly improve the ability to evaluate this program by allowing for a larger sample of program participants to be interviewed about their experience with the program. In addition to this contact information, the business type of the end users purchasing the bulbs would improve the accuracy in which hours-of-use, peak coincidence factors and interactive effects are assigned. To accurately determine delta watts the tracking data should also include program bulb lumen output and specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.) All of these variables are critical to estimate program impacts and should be verified for accuracy. The evaluation team also recommends including retail sales price on a record-by-record basis in the tracking data. This would allow for a more robust analysis of customer purchasing decisions based on bulb cost. The program is encouraged to continue to remind distributors about the need to provide ComEd with contact information of customers that receive program rebates and assess throughout the program year that this data is being collected appropriately.

- **Delta Watts Estimation:**
  Finding. The PY4 delta watts approach used in the Goals Tracker mapped all CFLs, regardless of bulb type, to a single base wattage.
  Recommendation. The evaluation team recommends switching to a bulb-type lumen mapping (such as the one presented within this evaluation report that is based on the new Energy Star draft specification for lamps[6]). Using a lumen-based method that also relies on bulb shape provides a more robust means of establishing base wattage equivalents across all bulb types, especially specialty CFLs and LEDs. Because lumen output is a measure of the total light produced in all directions from a source, bulbs such as reflectors (and LEDs in general) that focus light in a single direction require a different lumen mapping than a standard CFL. The Technical Resource Manual (TRM) that goes into effect in PY5 assigns base-wattages using lumen bins that are not differentiated by bulb type (except for LEDs) and thus this issue continues under the PY5 TRM.

- **Residential vs. Non-Residential and Residential In-Unit vs. Common Space Installations:**
  Finding. Currently there is no deemed Residential versus Non-Residential installation location split, nor is such a split included in the PY5 TRM[7] for Commercial Lighting programs.[8] This

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[6]http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Specification.pdf?4749-8e30

[7] The Illinois TRM was developed through a joint effort of all the members of the Illinois Stakeholder Advisory Group (SAG) and is filed for approval by the Illinois Commerce Commission (ICC) as of the filing of this report as a jointly agreed to TRM.

[8] The PY5 TRM for Residential Lighting Programs states "If the implementation strategy does not allow for the installation location to be known (e.g. an upstream retail program), evaluation data could be used to determine and

commercial lighting program is unique in that a high percentage of program bulbs are sold to residential apartment buildings, condominiums, or Co-Ops, and then installed in either residential units or common areas. Based on PY4 program tracking data and data collected during the end user telephone surveys, the evaluation team estimated that more than 20% of PY4 MSI program bulbs were being installed in residential buildings, three-quarters of which were common area installations and the remaining were in-unit installations[9].

Recommendation. Because both the Res/NonRes split and the residential in-unit versus common area installation can have a large impact on the resulting program impact estimates, the evaluation team believes this parameter should be estimated again in PY5 with a larger sample of customers. Deeming the residential in-unit versus common area split may be appropriate if it appears to have a relatively stable distribution, however the split between the various commercial business types (including residential) should be evaluated each year based on program tracking data.

- **Installation Rate:**
  Finding. In PY4 the overall installation rate was found to be 73% based on the Research Findings. This installation rate was disaggregated by both bulb type and quantity of program bulbs purchased by end-user and correlations seem to exist (standard bulbs had higher installation rates than high wattage or specialty bulbs, and end users purchasing fewer than 50 bulbs had higher average installation rates than those purchasing 50 or more bulbs). Unfortunately, due to small end-user survey sample sizes the differences found were not statistically significant.
  Recommendation. The evaluation team recommends that ComEd ensures the end-user contact information is available for PY5 sales so that a larger end-user telephone survey can be conducted. A larger sample would allow for correlations between bulb type and quantity of program bulbs purchased (as well as potentially other segmentation variables, such as end user business type) to be evaluated in a robust and multifaceted manner. Additionally, the Illinois TRM that goes into effect in PY5 applies the installation rate assumptions for Residential Lighting (69.5% in first year, 15.4% in 2nd year and 13.1% in final year) to commercial and industrial (C&I) lighting programs. As the TRM points out, these installation rate patterns were not determined based upon C&I evaluations and are being used for C&I until a more appropriate evaluation in this area is performed. A larger end-user sample is necessary to evaluate such assumptions.

- **Net-to-Gross Ratio (NTGR) Estimation:**
  Finding. This program has not been evaluated before and so according to the NTG Framework[10] the NTGR is to be applied retroactively for PY4. The NTGR for the PY4 MSI program was

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appropriate residential v commercial split". A similar statement may also be appropriate within the commercial lighting section of the PY5 TRM.

[9] Program bulbs installed into common area within a residential building should be considered non-residential installations from a program spending perspective. Considering this only 5.5% of program bulbs should be considered residential installations.

[10] "Proposed Framework for Counting Net Savings in Illinois." Memorandum March 12, 2010 from Philip Mosenthal, OEI, and Susan Hedman, OAG.

estimated to be 0.63[11] based on applying a customer self-report method to data gathered during the end user telephone surveys. While this estimate may be lower than expected, the Supplier Self-Report NTGR estimate of 0.56 is regarded as a directional indicator to give context to the Customer Self-Report NTGR. Distributors generally indicated that they had already been selling these types of lighting products for a number of years prior to the program and that sales had been steadily increasing. As such, they said it was somewhat difficult for them to disaggregate the impacts of the program from their general sales trends. Similarly, 50% of end user survey respondents said they had purchased CFLs from their distributor prior to the program, and 26% reported the CFLs they bought through the program replaced all or mostly CFLs. Another 6% said they replaced half CFLs and half incandescents, and 20% said they replaced a mixture of bulb types. All of these findings support NTGR estimates substantially less than 1.0.

The NTG analysis performed in PY4 indicated a correlation between the quantity of program bulbs purchased (which varies widely across program participants from 1 to 5,000) and type of bulb purchased (standard, specialty and high wattage). NTGR also appears to vary by customer business type, with some C&I segments more likely to buy efficient lighting products in the absence of incentives than others.

Recommendation. The PY4 evaluation of NTGR was constrained by the small sample of customers the evaluation team was able to conduct telephone surveys with due to limited contact information. The evaluation team recommends working closely with program distributors to ensure end user contact data is available to the evaluation team in order to increase the robustness and segmentation used to evaluate the MSI NTGR in PY5. Larger samples of program participants will also allow for the evaluation of NTGR by bulb type, which will assist ComEd in altering product offerings or incentives, if necessary, and evaluating NTGR by business type could possibly assist ComEd and program distributors targeting various business types which are less likely to use CFLs. Because the majority of distributors interviewed indicated CFL sales are a very small percentage of their overall retail sales, the evaluation team recommends that ComEd or the program implementer request pre-program CFL sales data from each of the distributors. This would allow for the estimation of a data driven baseline from which to calculate the sales lift of screw-in CFLs in PY5 that are in large part attributable to the program.

E.4   Key Process Findings and Recommendations

The following list summarizes the key process findings and recommendations from the study:
- **Program Satisfaction:**
  Finding. Distributors are generally satisfied with the program; however, they have had some initial difficulty understanding which products qualify. Nearly all the distributors interviewed reported being very satisfied or extremely satisfied with the program managers and other staff. Additionally, most distributors reported being very satisfied with the sales the program generated for their business. Ten out of eleven distributors credit the program with increasing their business and sales of CFLs. Most distributors reported that the expansion of the program in PY5 to linear fluorescent bulbs, metal halide bulbs, and LEDs would positively influence their

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[11] The 90% confidence interval on the Customer Self-Report NTGR estimate is +/- 3% (0.59 to 0.66).

program sales in some way. End users also reported high levels of satisfaction, with the majority (84%) reporting they were satisfied or very satisfied with the CFLs that they purchased through the program.

Recommendation. The evaluation team recommends that ComEd develop the list of qualifying products for each program year as soon as possible. Some distributors recommended developing this list sooner than the program has in the past because of amount of time it takes to ensure that all lighting products offered adhere to the requirements of the program.

- **Familiarity with Efficient Lighting Options:**
  Finding. Eighty-eight percent of end users reported that they were either very familiar or somewhat familiar with CFLs prior to purchasing them. Only a few end use customers were new users of CFLs and many customers already had CFLs in most of their sockets (only eight percent reported having no CFLs installed prior to purchasing program CFLs and a third reported they had CFLs installed in 75% or more of their sockets prior). Additionally, two-thirds of end users reported being familiar with screw-in LED light bulbs, although few had any installed (29%). So while familiarity with efficient lighting was quite high, it was interesting to note that energy efficiency was not the prime consideration for end use customers when selecting screw-in bulbs to purchase for their business. Equal numbers decide based on wattage and price (28%) and a much smaller percentage (14%) said they make their selection based on energy efficiency. At the same time the most common barrier to purchasing CFLs was that they were too expensive.
  Recommendation. ComEd is encouraged to consider developing and sharing enhanced marketing and education materials with distributors to help them better promote the program and highlight the energy savings resulting from switching to CFLs to customers. Many of the distributors interviewed said they received a minimal amount of marketing materials from ComEd, and at least one distributor recommended developing enhanced ComEd-branded materials to help them promote the program. Developing marketing materials that illustrate the net customer savings resulting from installing CFLs can help convince business customers that CFLs are a technology worth investing in.

- **EISA Awareness:**
  Finding. A majority of customers (61%) report being aware of the change in federal light bulb regulations due to EISA. Just over two-thirds of (69%) of all customers reported that they do not believe the new regulations will impact the lighting products their organization installs. Most distributors said that their customers' purchasing decisions are slowly changing due to new lighting regulation.
  Recommendation. ComEd should consider using EISA 2007 to educate customers about CFLs and other efficient lighting products, as well as proper replacement of efficient lighting. Commercial customers are typically more informed than residential customers about existing regulations and proper replacement of efficient lighting. While most commercial customers report being aware of EISA 2007, and do not believe the new regulations will impact the lighting products their organization installs, there is still a need to ensure that as many commercial customers are educated about proper disposal practices as possible. ComEd should consider working with participating distributors to develop effective techniques and educational materials to continue to educate customers about efficient lighting replacements.

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- **CFL Recycling:**
  Finding. Most distributors interviewed reported that ComEd did not provide them with any support to encourage environmentally safe recycling and disposal of CFLs. The majority reported that they already offer recycling opportunities to their customers, but some said they would like to find ways to work with ComEd to make their commercial customers more aware of ways to recycle CFLs.
  Recommendation. The evaluation team recommends that ComEd work with distributors to ensure that effective CFL disposal practices for commercial customers are in place.

1. Introduction to the Program

1.1 Program Description

The Non-Residential Midstream Incentives Lighting Program provides incentives to increase the market share of Energy Star qualified compact fluorescent lamps (CFL) sold to business customers. The Midstream Incentives Program was launched as a pilot in PY3 (launched in October of 2010 but the bulk of sales did not begin until February 2011). The program was designed to provide an expedited, simple solution to business customers interested in purchasing efficient lighting by providing an instant discount at the point of sale. The program targeted distributors whose customer base is predominantly end users, as opposed to those mostly selling to contractors.

At this time the program provides incentives on a mix of standard, specialty, and high wattage CFLs. The PY4 incentives were set at one dollar per standard CFL, three dollars per specialty CFL, and five dollars per high wattage CFL. Because the program includes both single-pack and multi-pack CFLs, incentives per package range from one dollar to $60. Starting in December 2011, ComEd ran a promotion to increase incentive levels to two dollars per standard CFL and five dollars per specialty CFL. Based on the success of this promotion these increased incentives will continue through the end of PY4.

In total, PY4 Midstream Incentives sales came from a total of 18 unique distributor chains and 75 individual distributor locations.[12] Four of these distributors were recruited for the PY3 pilot and an additional 13 signed up for the PY4 program. Table 1-1 below summarizes for each of the PY4 program retailers the number of program transactions, the number of program CFLs sold, the average size of each transaction, and the total incentives paid. As this table shows, Distributor P accounted for 50% of the CFL sales, and 65% of the incentives paid. Table 1-1 also shows that the number of bulbs sold per transaction averaged just over 100 but ranged from a low of 10 to a high of 800.

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[12] A total of 59 of these 75 locations came from two retail chains.

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Table 1-1. PY4 Sales by Distributor

Distributor	Transaction Count		CFL Sales		Avg Bulbs/ Transaction	Incentives Paid	
Distributor A	275	5%	7,359	1%	27	$21,947	1%
Distributor B	981	19%	31,162	5%	32	$94,511	4%
Distributor C	189	4%	7,529	1%	40	$12,731	1%
Distributor D	50	1%	4,012	1%	80	$8,173	0%
Distributor E	7	0%	458	0%	65	$2,166	0%
Distributor F	50	1%	1,962	0%	39	$2,766	0%
Distributor G	8	0%	186	0%	23	$398	0%
Distributor H	395	8%	7,869	1%	20	$17,225	1%
Distributor I	134	3%	1,363	0%	10	$4,290	0%
Distributor J	725	14%	15,058	3%	21	$36,986	2%
Distributor K	33	1%	1,434	0%	43	$3,404	0%
Distributor L	482	9%	35,916	6%	75	$86,640	4%
Distributor M	108	2%	86,412	15%	800	$86,412	4%
Distributor N	29	1%	18,216	3%	628	$22,770	1%
Distributor O	12	0%	2,486	0%	207	$4,174	0%
Distributor P	1,500	29%	285,545	50%	190	$1,369,552	65%
Distributor Q	236	5%	68,285	12%	289	$340,825	16%
Total	5,214	100%	575,252	100%	110	$2,114,970	100%

Source: Evaluation Team analysis of ComEd MSI Tracking database

1.2   Evaluation Questions

The evaluation sought to answer the following key researchable questions.

Impact Questions:

1. What is the level of gross annual energy (kWh) and peak demand (kW) savings induced by the program?

2. What are the net impacts from the program? What are the levels of free ridership and spillover associated with this program and how can they be reduced?

3. Did the program meet its energy and demand goals? If not, why not?

Process Questions:

1. What is the distributors' experience and satisfaction with the Midstream Incentives Program?

2. What is the end users experience and satisfaction with the Midstream Incentives Program/program bulbs?

3. How aware are customers of the ComEd-sourced CFL bulb discounts? How effective are the in-store promotional materials?

4. How aware are customers of changes in available lighting products as a result of EISA 2007 implementation? How do customers expect their own lighting purchasing decisions will be affected by the changes in the options available for purchase?

5. How can the program be improved?

2. Evaluation Methods

2.1 Primary Data Collection

The data collected for the evaluation of the PY4 Midstream Incentives Lighting Program was gathered via in-depth telephone interviews with key program staff and lighting distributors, CATI telephone surveys with program end users, and ComEd tracking data analysis. Table 2-1 below provides a summary of the data collection activities including the targeted population, the sample size and the objectives of the efforts.

Table 2-1. PY4 Data Collection Activities

Collection Method	Targeted Population	Sample Size	Gross Impacts	Net Impacts	Process
Tracking Data	Program Participants	All	X	X	
In-Depth Telephone Interviews	Program Manager	1	X	X	X
	Program Implementer	1			X
	Lighting Distributors	11	X	X	X
CATI Telephone Surveys	MSI End Users	51	X	X	X

2.1.1 Tracking Data

The tracking data delivered for this evaluation consisted of two databases. The first database contained detailed program bulb invoice data from participating distributors, and the second database contained higher level information and tracked cumulative weekly program bulbs sales compared to sales goals. The second database was used by ComEd to come up with their estimate of PY4 program ex ante savings. Specifically, these databases consisted of the following:

- _Midstream Incentive Tracking Database_ – This database included all program CFL sales invoiced after June 1, 2011. The key variables in this database included the distributor name and address, the memorandum of understanding (MOU) number, the bulb description and model number, the number of program bulbs sold, the rebates paid for these program bulbs, and the date of invoice. A number of data cleaning steps were taken to make sure PY4 bulb sales were complementary and non-overlapping with bulb sales attributed to PY3. A small number of bulbs sold in PY3 were counted as PY4 sales due to a delay in the invoicing of the bulbs and their subsequent exclusion from the bulbs counted as PY3 sales. The PY4 analysis dataset was finalized based on the most recent program tracking database received from ComEd (dated September 25, 2012). This dataset contained sales data for 5,238 transactions (corresponding to

the sale of 575,897 bulbs). Of these bulbs, 570,155 were found to have been sold during PY4, 5,097 were sold during PY3 but invoiced after the PY3 cutoff and so are counted as PY4 sales, and 645 bulbs that were included in the PY3 sales analysis and so have been dropped from PY4. This resulted in a total of 575,252 program bulbs attributed to PY4.

- *PY4 Goals Tracker* - This spreadsheet tracked cumulative weekly program bulbs sales compared to sales goals and allocated program dollars. Along with bulb sales, the record for each combination of model number and retailer included the CFL wattage, manufacturer, product description, rated life, the number of bulbs per package and the incentive requested from ComEd per package. This database did not include suggested retail price per package, lumen output or base wattage of the equivalent incandescent bulb as did the Goals Tracker for the Residential ES Lighting Program.

The final tracking databases for this program were generally comprehensive and easy to use. There were a number of variables in the tracking database for which the data included in the tracking databases was either missing or inaccurate (for instance lumen output was not listed for any of the program CFL models and in some cases the model number was in fact the item number rather than the model number). This made it challenging to do manual online lookups to gather detailed bulb information (such as lumen output) that was not included in the tracking data.

2.1.2   Program and Implementer Staff Interviews

The evaluation team conducted two in-depth interviews with program staff as part of this evaluation. One of these interviews was conducted with the ComEd MSI Program Manager and one with the Applied Proactive Technologies (APT) Implementation Manager. These interviews were completed over the telephone in February and June of 2012. Both interviews focused on changes to the program from the PY3 pilot to PY4, the perceived effectiveness of the program, and plans for PY5. The interview guides used are included in Section 6.

2.1.3   Program Distributor Interviews

The evaluation team conducted a series of interviews with program distributors who are responsible for selling efficient lighting to business customers. These interviews were used to support both the impact and process components of the evaluation. Distributor surveys were used as a secondary source to gather data required to estimate a number of the gross impact parameters, such as the leakage, displaced watts, hours of use, and peak coincidence factors. Distributor surveys were also used to gather data on a number of process questions, including marketing material proliferation, customers' awareness of market changes due to EISA, customer awareness of program discounts, customer decision-making processes, distributor satisfaction, challenges to participation, and recommendations for program improvement.

A total of 11 participating distributors were interviewed, most of whom were able to provide data used to calculate a supplier self-reported NTGR estimate. These distributors collectively represented 99% of total CFL sales in PY4, with one distributer representing 62% of sales. Priority for inclusion in the distributor interviews was based upon high levels of program sales. Because the evaluation team was initially unable to schedule an interview with one of the top 10 distributors, we interviewed the 11th distributor with the highest program sales. We eventually completed an interview with the one remaining distributor in the top 10, bringing the total number of distributors interviewed to 11.

2.1.4   Program End User Telephone Survey

The evaluation team conducted a telephone survey with a random sample of end use customers who purchased lighting through the PY4 Midstream Incentive Lighting Program. These telephone surveys collected data to estimate the parameters necessary to calculate gross and net energy and demand impacts and assess process-related questions. This survey was fielded between August 15 and September 7, 2012. The original goal was to conduct a total of 200 end user surveys. The evaluation team set this goal before we had complete program tracking information. As noted previously, the tracking data did not contain contact information for the program end users and thus it was requested from program distributors, which yielded significantly fewer sample points than desired.[13] The final sample frame for our survey included 452 customers, and we completed 51 surveys.

For the process evaluation, the surveys contained questions regarding usage of CFLs, awareness of bulb types, awareness of federal regulatory changes, awareness of program discounts, as well as satisfaction with and barriers to purchasing CFLs. For the impact evaluation, the survey focused primarily on questions designed to estimate the self-reported net program impacts.

2.1.4.1   Sampling

The sample used for the end user telephone survey was provided to the evaluation team by nine of the lighting distributors. Two of the 11 distributors interviewed were not able to provide sample data—one distributor was not required to track program data as part of its agreement with the program and another distributor was not responsive to the evaluation team's requests to obtain sample data.

2.1.4.2   Survey Disposition

Table 2-2 shows the final disposition resulting from the end user survey of the 51 ComEd commercial customers who purchased program discounted bulbs through the distributors. We called each customer numerous times at different times of day and scheduled call backs with anyone who wanted to be called at a later time. In total, 51 interviews were completed.

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[13] End user contact information is a requirement for participation in the PY5 MSI program and so hopefully gathering a larger sample will not be an issue in PY5.

Table 2-2. End User Survey Call Disposition

Call Disposition	End User Survey	%
Sample Pulled	452	100%
Completes	51	11%
Refusal	174	38%
No answer/answering machine/busy/call back, unable to complete	177	39%
Disconnected/wrong number, blocked	36	8%
Not Eligible[14]	14	3%

Source: Navigant Evaluation Team Analysis of End User Survey Data

2.2 Impact Evaluation Methods

The analytical methods used for the evaluation of the PY4 MSI Program were driven to a large extent by the data that was available for this upstream program. In PY4, program distributors were not required to provide end user contact information and thus, this evaluation was constrained by our inability to survey the quantity of end users desired. End user contact information is a requirement for participation in the PY5 MSI program. In PY4, the Research Findings Savings were not calculated separately for standard, specialty and high wattage CFLs due to insufficient sample sizes for each of the various bulb types. Energy and demand savings parameters were shared by all program bulb types.

2.2.1 Gross Program Savings

Research Findings Gross Savings (energy, demand, and coincident peak demand) resulting from the PY4 Midstream Incentives Lighting Program were calculated using the following algorithms:

$$GA\ kWh = \#bulbs \ * \ \left(\frac{\Delta W}{1000}\right) * \ HOU * Energy\ IE * IR * Leakage$$

$$GA\ kW = \#bulbs \ * \ \left(\frac{\Delta W}{1000}\right) * \ IR * Leakage$$

$$GA\ peak\ kW = GA\ kW * CF * Demand\ IE * IR * Leakage$$

Where:

GA kWh	=	Research Findings Gross Annual kWh Savings (energy)
GA kW	=	Research Findings Gross Annual kW Savings (demand)
GA peak kW	=	Research Findings Gross Annual Peak kW Savings (coincident peak)
# bulbs	=	Number of program bulbs sold
ΔW	=	Delta Watts (baseline [incandescent] watts - CFL watts)

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[14] A number of participants contacted as part of the survey were deemed "not eligible" for the survey since they did not pass some basic survey requirements. Bulbs sold to customers who got electricity from a supplier other than ComEd and who were not billed by ComEd were considered "leaked" bulbs.

HOU	=	Annual Hours of Use
IE	=	Interactive Effects
IR	=	Installation Rate
CF	=	Peak load coincidence factor (% of bulbs on during peak summer hours)

Table 2-3 below shows the data sources used to estimate the Research Findings Gross Savings parameters for the MSI Program. As this table shows, there were no deemed savings estimates for this program as it was in its first full year of operation. As a result the PY4 Research Findings Savings were equal to PY4 Research Findings.

Table 2-3. Research Findings Gross Savings Parameter Data Sources

Gross Savings Input Parameters	Data Source	Deemed or Evaluated?
Program Bulbs	PY4 EM&V Program Tracking Data Analysis	Evaluated
Delta Watts	ES Lumen and bulb type mapping from ComEd Residential Lighting	Evaluated
Hours of Use (HOU)	Res – PY5 IL Residential TRM[15] NonRes – KEMA PY4 Operations Manual[16]	Evaluated
Peak Load Coincidence Factor	Res – PY5 IL Residential TRM NonRes – KEMA PY4 Operations Manual	Evaluated
Energy Interactive Effects	Res – PY4 Analysis NonRes – KEMA PY4 Operations Manual	Evaluated
Demand Interactive Effects	Res – PY4 Analysis NonRes – KEMA PY4 Operations Manual	Evaluated
Installation Rate	PY4 End User Surveys	Evaluated
Leakage	PY4 End User Surveys	Evaluated

Program Bulbs

The number of bulbs distributed through the program during PY4 is a key parameter in the calculation of total gross and net program savings and is derived from the Midstream Incentives tracking databases provided to the evaluation team by ComEd. PY4 bulb sales numbers include 5,097 bulbs sold during PY3 (on or before May 31, 2011) that were invoiced after the PY3 invoice cutoff date (July 20, 2011) and thus were not included as PY3 sales.

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[15] The Illinois TRM was developed through a joint effort of all the members of the Illinois Stakeholder Advisory Group and is filed for approval by the Illinois Commerce Commission as of the filing of this report as a jointly agreed to TRM.

[16] KEMA. *Appendix A* of the *KEMA Operations Manual*. Prepared for Commonwealth Edison Company, August, 2009.

Delta Watts

The delta watts parameter is a measurement of the wattage displaced by the newly installed program CFLs. To estimate the number of watts displaced by program bulbs it is necessary to estimate the most probable incandescent wattage that the program bulb is likely to have replaced. Once this incandescent wattage has been estimated, the displaced watts (or delta watts) can be calculated as the difference between the wattage of the replaced incandescent bulb and the wattage of the new CFL. Because delta watts were not deemed for this first full program year of the MSI program, Research Findings Savings were estimated using a bulb type and lumen based method developed for the ComEd Residential Energy Star Lighting Impact Evaluation Research Report. Delta watts estimates based on the program tracking data are also provided in this report.

The evaluation team believes the bulb type and lumen mapping employed is the most robust means currently available to establish incandescent equivalent wattage across all bulb types, especially specialty CFLs, which made up 65% of MSI PY4 sales. Because lumen output is a measure of the total light produced in all directions from a source, bulbs such as reflectors that focus light in a single direction require a different lumen mapping than a standard CFL. It is important to note that while lumens are becoming a more universal metric for light output across bulb types, industry experts suggest that lumens alone are not adequate to fully characterize the performance of directional lamps.[17] The bulb type and lumen mapping recommended for PY4 is taken from the new Energy Star DRAFT[18] specification for lamps.[19] Table 2-4 below shows the lumen to incandescent equivalencies for directional and non-directional bulbs from this ES specification. While this specification differentiates the lumen ranges or "lumen bins" for identifying incandescent equivalencies for directional versus non-directional bulbs, it is technology neutral in the sense that lumen to incandescent mappings apply to all lamps in a given category, regardless of type (i.e. CFL or LED).

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[17] The Lighting Research Center notes that "Most lamp manufacturers do not publish lumen output ratings for MR16 lamps or other reflectorized lamps in their catalogs. Instead, they publish beam angle and [Center Beam Candle Power], which provide more accurate information about the performance characteristics of the lamp." Similarly, Sylvania reports that "Requests are often received for the lumen output values for aluminum reflector or AR-type lamps. Usually, this is a meaningless specification; candlepower is the appropriate value for a reflector lamp since they are used for accent and display lighting. "
http://www.lrc.rpi.edu/programs/nlpip/lightingAnswers/mr16/performance.asp
http://assets.sylvania.com/assets/documents/faq0007-0297.cb5b8f25-05ee-463d-8d0c-c60912a4adf7.pdf

[18] It is important to keep in mind this specification is still DRAFT and under review of many parties. The evaluation team will continue to monitor the status of this specification and will update ComEd on any significant changes or alterations.

[19] http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Specification.pdf?4749-8e30

Table 2-4. Lumen and Incandescent Equivalents

Light Output (Lumens)						
Standard Incand. Base Wattage	Omni Direction (except Globe)	Globe	Directional (R, BR, and ER)[20]	Directional R20	Directional Larger than R20	Decorative
10						≥ 70
15						≥ 90
25	≥ 250	≥ 250	≥ 250			≥ 150
40	≥ 450	≥ 350	≥ 400			≥ 300
45			≥ 450	≥ 630	≥ 750	
50			≥ 500	≥ 720	≥ 850	
60	≥ 800	≥ 500	≥ 600			≥ 500
65			≥ 650	≥ 1010	≥ 1190	
75	≥ 1,100	≥ 575	≥ 750	≥ 1210	≥ 1420	
90			≥ 900	≥ 1520	≥ 1790	
100	≥ 1,600	≥ 650	≥ 1,000	≥ 1740	≥ 2050	
120			≥ 1,200	≥ 2190	≥ 2580	
125	≥ 2,000		≥1,250			
150	≥ 2,550	≥ 1100	≥ 1,500	≥ 2910	≥ 3430	

Source: ENERGY STAR V1.0 Draft Specification for Lamps[21]

Annual Hours of Use (HOU)

In order to estimate the energy savings from a newly installed CFL, it is necessary to understand the average number of hours the lamp is turned on each day (which can then be annualized by multiplying the daily value by 365 days). Assuming you have two bulbs that have displaced the same number of watts, the lamp that is turned on for a greater number of hours over the course of the year will yield a larger number of kilowatt hours saved.

HOU for the PY4 Midstream Incentives Lighting Program evaluation were developed by first estimating the business type of the locations where the bulbs were installed and then applying HOU estimates by business type to the proportion of program bulbs installed with each of the various business types.

Business types were initially assigned based on the customer name variable provided in the tracking database. Business type assignment algorithms were developed using either the actual customer name (for example, if CustomerName = "McDonalds" then BusinessType = "Restaurant") or a portion of the customer name (for example, if CustomerName = 'Main Street Condos", then BusinessType =

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[20] The DRAFT specification calls for two sets of criteria for Directional (R, BR and ER lamps). The column shown here is only to be applied to the following lamps: - 65 watt BR30, BR40 and ER40 lamps, BR30, ER30, BR40 andER40 lamps ≤ 50 W, R20 lamps ≤ 45 W, Lamps ≤ 40 W, and Lamps smaller than 2.25" diameter. The specification directs that all other directional lamps shall be greater than or equal to that of the referenced lamp in the other "Directional" columns. The guidelines given in the draft specification result in a very non-intuitive lumen to wattage mapping (i.e. a BR40 bulb with a lumen output of 650 gets mapped to a 65 watt bulb but a BR40 with a lumen output in the range of 651 – 1009 would get mapped to a lower wattage bulb). As a result of this the evaluation team carried out the lumen requirement of 10x the wattage for this whole category which is in line with what the manufacturers are now reporting on CFLs packages.

[21] http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Specification.pdf?4749-8e30

"Apt/Condo"). This type of assignment algorithm successfully assigned business types to approximately 60% of the PY4 program participants. Program end users who had not been assigned a business type after this first assignment level were sorted based on the number of program bulbs they purchased and those with the highest number of bulbs were manually looked up to determine the appropriate business type. As part of the end user telephone surveys, customers were also asked to identify their business type, and these responses were used to assign or update business types for the sample of customers surveyed. In total, business types were assigned to end users who accounted for more than three-quarters of the PY4 bulbs sold. Nearly two-thirds of those who were not assigned business types were sold through retail pro desks and thus no individual customer data was available to attempt to assign business types for these sales.

After business types had been assigned, the commercial building type-specific HOU estimates from the workpapers created by KEMA for the PY4 ComEd prescriptive program[22] were applied to the distribution of specific commercial building types into which program bulbs were being installed. Approximately 20% of the business types assigned were "Apt/Condo" which indicates the program bulbs were being installed in a residential building. The end user surveys were used to estimate the percentage of these residential installs that were going into individual residential units versus interior or exterior common areas[23]. HOU were then assigned for these program bulbs based on the HOU estimates included in the PY5 TRM for Residential Lighting for in-unit Multi-Family, Multi-Family Common Areas or Exterior Locations.[24]

Peak Load Coincidence Factor

The peak load coincidence factor (CF) allows for the estimation of the average demand savings that occur during ComEd's peak period (summer weekdays from 1 to 5 p.m.[25]). Both the ComEd Prescriptive Workpapers and the PY5 TRM for Residential Lighting include estimates of Peak CF by business type or residential location and thus the method described above to estimate the annual HOU was also used to estimate the Peak Load CF for the MSI program.

Energy Interactive Effects

CFLs use less energy than incandescent lamps to produce the same amount of useful light. As a result, CFLs produce less waste heat than incandescent lamps. At times of year when customers cool their homes and businesses with air conditioning systems, the reduction in heat produced by replacing incandescent bulbs with CFLs can provide the additional benefit of reducing cooling loads. Conversely, during the heating season, the reduced heat can result in net increases in heating requirements. The cooling benefits and heating penalties associated with CFL retrofits are referred to as "interactive

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[22] KEMA. *Appendix A* of the *KEMA Operations Manual*. Prepared for Commonwealth Edison Company, August, 2009.

[23] Program bulbs installed into common area within a residential building should be considered non-residential installations from a program spending perspective. Considering this only 5.5% of program bulbs should be considered residential installations.

[24] These were the same estimates used within the PY4 Residential ES Lighting Program evaluation.

[25] This is also the PJM bidding "peak" (2 p.m. to 6 p.m. Eastern Standard Time).

effects".[1] The ComEd PY4 Prescriptive Workpapers include estimates of both energy and demand interactive effects by business type. As with the method described above to estimate the annual HOU and Peak CF, the commercial building type-specific interactive effects estimates from the workpapers created by KEMA for the PY4 ComEd prescriptive program were applied to the distribution of specific commercial building types into which program bulbs were being installed. For bulbs installed within the individual units of apartment buildings/condominiums,, the energy and demand interactive effects factors developed in the PY4 Residential ES Lighting program evaluation for interior bulb placements in multi-family units were applied. The factors developed in that report consist of default factors in the Residential Lighting PY5 TRM, adjusted to account for heating penalties in electrically heated homes based on data available through the U.S. EIA Residential Energy Consumption Survey (2009).[26] See the PY4 Residential ES Lighting program evaluation report for additional information on methods and data sources.

Installation Rate

In order for a program bulb to receive credit for energy savings in the Midstream Incentives Lighting Program within a given program year, it must be installed within that program year. For PY4, the evaluation team estimated the installation rate based on data collected during the end user telephone surveys. All customers surveyed as part of the PY4 end user survey were asked whether or not they had installed (and not since removed) all or a portion of the CFLs they had purchased through the program within the last year. Their responses were used to calculate an installation rate for the PY4 MSI Program.

Leakage

When program bulbs are sold through an upstream channel, as is done for the MSI Program, it is possible for program bulbs to be purchased at a program distributor and then installed in areas outside of ComEd service territory (therefore negating any ComEd energy savings from the installation of these bulbs). This phenomenon is referred to as leakage. As part of the PY4 evaluation, all end user survey respondents were asked if they received their electrical service from ComEd or had a supplier other than ComEd but were still billed by ComEd. This provided the data necessary to estimate the percentage of program bulbs that are leaving ComEd's service territory.

2.2.2   Research Findings Net Program Savings

Net savings analyses seek to determine a program's net effect on customers' electricity usage. This requires estimating what would have happened in the absence of the program. Thus, after gross program impacts have been assessed, net program impacts are derived by estimating a net-to-gross ratio that quantifies the percentage of the gross program impacts that can reliably be attributed to the program. The NTGR can be thought of as a metric of program influence. Research Findings Net Savings (energy, demand and coincident peak demand) resulting from the PY4 Midstream Incentives Lighting

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[1] For any CFL programs that are administered jointly between ComEd and the gas utilities, heating penalties resulting from increased heating loads in homes heated with natural gas should also be reflected in the interactive effects analysis.

[26] 2009 Residential Energy Consumption Survey (RECS) national sample survey of housing, state of Illinois and East North Central Census Division: http://www.eia.gov/consumption/residential/data/2009/

Program were calculated by multiplying the Research Findings Gross Savings estimates by the final Impact Research Report estimate of NTGR. This program has not been evaluated before and so according to the NTG Framework[27] the NTGR is to be applied retroactively for PY4.

For the PY4 Midstream Incentive Lighting Program evaluation two methods were used to estimate the NTGR. The results from these methods were then evaluated (based on their perceived level of relevance/accuracy) to produce a final NTGR estimate. The methods employed for the PY4 evaluation included:

1. Customer Self-Reported NTGR (via an end user telephone survey)
2. Supplier Self-Reported NTGR (via in-depth interviews with program lighting distributors)

Customer Self-Report NTGR

Estimating the NTGR using the customer self-report method requires the calculation of free-ridership and participant spillover. Free-ridership refers to program bulb purchases that would have taken place anyway in the absence of the program, and spillover refers to positive impacts of the program on sales of non-program energy efficient lighting products. Once these two parameters have been estimated, the NTGR can be calculated as follows:

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

Free-Ridership
The calculation of free-ridership using the customer self-report method relies on customer survey questions addressing the following two items:

1. The degree of influence the program had on the customer's decision to install CFLs (Program Influence Score); and
2. What actions the customer would have taken on their own in the absence of the program (No-Program Score).

The calculation of free-ridership combines the Program Influence score and the No-Program score for each customer to come up with a customer-level free-ridership score. The Program Influence and No-Program scores can take values of zero to ten, where a lower score indicates a higher level of free-ridership. Program-level free-ridership is then determined by taking a program bulb-weighted average of the individual customer-level free-ridership scores.

The Program Influence score was estimated based on self-reported answers regarding the influence level (on a scale of zero to ten, where zero equals not at all influential and ten equals very influential) of several factors on the customers' decision to install CFLs instead of standard efficiency bulbs, including:

1. The availability of the incentive
2. Information from the Midstream Incentive Program or ComEd marketing materials
3. Recommendation from a salesperson

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[27] "Proposed Framework for Counting Net Savings in Illinois." Memorandum March 12, 2010 from Philip Mosenthal, OEI, and Susan Hedman, OAG.

4. Previous experience with ComEd's Midstream Incentive Program or similar utility programs

5. The overall importance of the Midstream Incentives Program in the end users decision to purchase screw-in CFLs from the distributor.

Customers were also asked to rate the overall importance of the MSI Program in their decision to purchase the screw-in CFLs using a 0 to 10 scale, with 0 being 'not at all important' and 10 being 'very important'.

The No-Program score was similarly based the influence level (scale of zero to ten) of several factors on the customers' decision to install CFLs instead of standard efficiency bulbs:

1. Previous experience with screw-in CFLs

2. Are CFLs considered standard practice in the customer's industry?

3. Does Corporate Policy or guidelines require that the customer purchase high efficiency lighting such as CFLs?

4. How likely is it (on a scale of zero to ten, where zero equals not at all likely and ten equals very likely) that they would have bought the same CFLs in the absence of the program?

The algorithm used to calculate the No-Program score adjusts the score assigned to customers upward if they indicate that they would have purchased and installed the CFLs on their own in the absence of the program, but that the program either accelerated their CFL installation or led them to install a greater number of CFLs.

As with all NTGR methods, the customer self-report method also has threats to its validity such as customers who either overstate their preference for CFLs because they think of themselves as "green" or understate their sensitivity to price, both of which would result in lower NTGR estimates. Conversely, some customers may overstate the influence the program is having on their decision to purchase CFLs in hopes that such a response will result in continued incentives being provided by ComEd for the purchase of CFLs.

Spillover

Participant spillover was also estimated using data from the end user telephone surveys. Participant spillover includes all adoptions of energy efficient lighting measures that are influenced by the program, but are not done through the program (i.e., are not rebated). It is reasonable to expect that the program, by providing information on the benefits of energy efficient lighting and experience with such technologies, motivates customers to install energy efficient lighting without the program rebate.
The end user telephone surveys fielded as part of this evaluation gathered information on CFL lighting installations that were made by program participants for which they did not receive a program rebate. The information collected included:

1. The quantity and type of the efficient lighting equipment installed without a rebate

2. The degree of self-reported influence of the program on the decision to purchase the efficient lighting equipment

Lighting purchases were considered a spillover adoption if the following conditions were met:

a) The lighting product was energy efficient.

b) The degree of self-reported influence of the program on the purchase of the energy efficient lighting equipment was sufficiently high to reasonably conclude that the adoption would not have occurred in the absence of the program. Additionally, for non-participants, this required that the customer was aware of the Smart Lighting Discounts program prior to making the purchase.

c) The customer did not receive any rebates whatsoever for the efficient lighting purchase.

d) The participant spillover rate was calculated by summing the spillover adoptions over all program participants and then dividing this sum by the total number of purchases made through the program.

Supplier Self-Report NTGR

The supplier self-report approach relies on information collected from in-depth interviews with participating lighting distributors to estimate free-ridership and the influence of the program on non-program CFL sales for various bulb categories. During the interviews, respondents were asked to estimate the percentage by which their sales of compact fluorescent products would have been different in the absence of the Program. In cases where differentiated answers for percentage sales change were provided by program bulb type, free-ridership was calculated as a weighted average by bulb type. Self-reported estimates of sales changes due to the program were cross-checked for consistency with other questions in the interview regarding sales of program bulbs compared with non-program bulbs.

It is recognized that the supplier self-report approach to NTGR estimation has some threats to internal validity. Respondents may have motivations that introduce bias in their NTGR-related responses. For example, one possible source of bias would be a tendency on the part of distributors, who have a vested interest in the continuation of the program, to overestimate its impacts. Conversely, distributors may tend to underestimate the impacts of the program based on a belief that they can sell CFL products based on their own merits, even in the absence of program discounts. Another threat to validity arises because the distributors are not the ultimate purchasing and installation decision makers for the bulbs sold through the program.

An advantage of the supplier self-report approach to estimating free-ridership is that by focusing on the lighting distributors it covers the large majority of bulbs sold through the program. Also, interview respondents at this level have perspective on the net impacts of all of the program's components, in terms of sales of program CFLs and non-program CFLs.

3. Evaluation Results

3.1 Impact Evaluation Results

This section presents the Research Findings Gross and Net Savings results from the PY4 MSI Program evaluation. . Complete results are included in the appendices (Section 5).

3.1.1 Verification and Due Diligence Procedure Review

The evaluation team explored the quality assurance and verification activities currently carried out by implementation staff. We compared these activities to industry best practices[28] for similar commercial programs to determine:

1. If any key quality assurance and verification activities that should take place are currently not being implemented;

2. If any of the current quality assurance and verification activities are biased; and

3. If any of the current quality assurance and verification activities are too time-consuming and might be simplified or dropped.

This assessment primarily relied on in-depth interviews with implementation staff. We include a summary of key quality assurance and verification activities currently conducted by ComEd's Midstream Lighting program and recommendations for improvement; an overview of data collection activities carried out for this task; and detailed findings on current quality assurance and verification activities.

3.1.1.1 Summary and Recommendations

Overall, ComEd's quality assurance and verification procedures for the Midstream Lighting Program are strong and in accordance with best practices for such a program. In particular, the program is strongest in implementing and utilizing systems to ensure that only eligible products and eligible businesses are included in the program. Suggested improvements focus on documentation of existing procedures, collection of participating end user business contact information[29], and ensuring that MOUs with lists of eligible products are in place as early as possible prior to the start of a new program year.

Table 3-1 summarizes the quality assurance and verification activities currently carried out by the Midstream Lighting Program. It also features recommended changes to current procedures, as well as recommendations regarding additional activities that ComEd could implement to enhance current quality assurance and verification.

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

[29] This has been added as program requirement for PY5. Data should be reviewed early on in PY5 to ensure compliance.

Table 3-1. Summary of Quality Assurance Activities in Place and Recommendations

Quality Assurance Activities in Place	Recommended Changes
• Measures to ensure program and product eligibility requirements are communicated	• Formal documentation • Ensure qualifying product lists are developed and shared with distributors as early as possible
• Measures to ensure only qualified products and qualifying businesses are included in program	• Formal documentation
• Measures to ensure accurate data submission	• Require collection of business customer contact and telephone number on invoice to aid in annual evaluation process
• Field Representative support and oversight to asses progress towards goals and actions	• Formal documentation
• In-depth interviews with distributors to get feedback on program challenges and satisfaction	• None

3.1.1.2   Data Collection

Data for this effort was gathered through in-depth interviews with key implementation staff (see Table 3-2 for details). The Self Benchmarking spreadsheet found within the Best Practices in Energy Efficiency Programs (http://www.eebestpractices.com/benchmarking.asp) was used as a guide to aid in the collection of data from program implementation staff.

Table 3-2. Implementation Staff Contacts and Interviews

Implementation Staff Contact	Date Interviewed
Debra Ponder, Applied Proactive Technologies (APT)	October 29, 2012
Kerry Smith, Energy Federation Corporation (EFI)	October 31, 2012

3.1.1.3   Results

Eligibility

The rebate fulfillment process is managed by Applied Proactive Technologies (APT), with invoice verification and payment processing support from Energy Federation Corporation (EFI)[30]. APT manages communications with ComEd program staff to ensure that both program requirements and product eligibility information are transferred to both EFI and participating distributors.

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[30] EFI is a subcontractor to APT.

The process is initiated when ComEd program staff set program requirements and specifications for program qualifying products. Program Staff communicates that information to APT, who informs participating distributors of the specifications. Distributors then put together a list of products with SKUs that adhere to the program specifications (a "lamp list"). This lamp list is shared with APT, who develops individual MOUs for each distributor. The MOUs contain various stipulations, including the dates when the products are able to be incentivized, what products are eligible based on the program specifications, the distributors' lamp list, and the incentive amount per product. Each MOU is signed by both ComEd and the distributors.

If there are changes to the program, ComEd notifies APT. APT is responsible for sending updates about program changes to EFI and distributors, most commonly with an addendum to the MOU via email, but occasionally via conference call if bigger changes are being made. Similarly, APT communicates lamp list changes to both EFI and distributors through addendums to the MOU. Updates to the lamp list can be made as often as weekly for some of the distributors. This is often because distributors make requests to add additional qualifying SKUs that were not included on the original lamp list.

Assessment: The processes put in place to ensure that program eligibility requirement are communicated from ComEd through APT and EFI all the way down to the individual distributors are sufficient. The process for adding or removing program qualifying products from the lamp lists, and then communicating that information to all parties is also largely sufficient as well. Some distributors interviewed as part of the evaluation noted that developing the initial lamp lists sooner than they have been developed in the past would allow them to better prepare for the program year. We recommend that ComEd continue to work with distributors to develop the lamp lists as soon as possible. We also recommend that APT and EFI develop formal documentation of all processes that occur to ensure that program and product eligibility requirements and changes are effectively communicated to all involved parties.

Midstream Program Sales Data Verification

EFI does not require distributors to submit invoices within any specified time frame. Some distributors submit invoices weekly, and others submit invoices monthly. An end-of-year deadline for final invoice submission is stipulated within the MOUs. Distributors are required to provide information on each sale that includes the business name and address, the dates the sales took place, bulb wattages, model numbers, and manufacturer name. The invoice must contain the MOU number and total reimbursement dollar amount requested. APT shares a list of program-eligible zip codes with EFI to help ensure that only businesses that are ComEd customers are receiving discounted bulbs.

EFI receives the invoices electronically from distributors, and depending upon the file size, it is either initially stored on their server or printed out for review. EFI uses the Paradox relational database system to store their data. EFI will store the data on site for six months to a year, and then, depending on the program and state requirements, they will ship materials to their storage facility for at least seven years. EFI's company-wide policy is to ensure that data is added to their system within three days of receipt. EFI inputs invoices daily for the Midstream Lighting Program, and in turn sends them to APT on a weekly basis.

Before invoices are sent to the EFI data processing department, staff manually examines each invoice to ensure that all required information is included—product eligibility, however, is verified during the next stage in the process. Once this initial review occurs, invoices are sent to the data processing department to be added into EFI's system, which is built to recognize program qualified SKU numbers, number of bulbs purchased, incentive levels, and all other requirements as stipulated in the MOU. Data processing staff also enters the business name and address, but in PY4 were not required to enter a contact person's name or telephone number for each business.

The system contains lookup tables of all eligible products for each MOU that stop an ineligible product from being entered. When an issue is noticed with an invoice, EFI puts it on hold (either a system hold or a manual hold depending on whether it has been put into the system) until the issue is resolved, or a corrected invoice is submitted. Any discrepancies within an invoice are sent to APT through email and APT contacts the distributor for correction.

Once the data is entered into the database system, EFI runs a check to look for other discrepancies, such as dates or addresses that do not make sense. Once that is complete, a manual check is done by a separate EFI staff person than the staff person who entered the data to ensure that the information entered into the system matches the submitted invoice – this is followed by an additional electronic quality control check. Any errors found are corrected by EFI or, if necessary, APT is contacted to begin the process of resolving the issue.

Once EFI has verified the invoices, they share the information with APT for a second round of review by uploading the data to the Frontier System for APT and ComEd to view. APT performs checks to verify that all businesses that have submitted invoices are ComEd customers. APT sends a request for payment to ComEd once invoices are verified. APT distributes funds to EFI, who has the responsibility to release those funds to participating distributors for discounted bulb sales reimbursement.

Prior to sending checks to distributors, EFI's finance department manually verifies that the dollar amount on the check matches the invoice dollar amount originally submitted by the distributor. Upon the occurrence of any issues after issuing a check, EFI contacts APT to correct the issue. Distributors expect receipt of payment within thirty days of submitting an invoice to EFI. EFI's administrative staff also checks their records to ensure the process has adhered to EFI's quality assurance and verification procedures.

Assessment: Data verification for the Midstream Lighting Program is sufficient. Appropriate checks are in place to ensure that only eligible products are discounted, and only program qualifying businesses receive those discounts. We recommend developing formal documentation of all of the quality assurance and verification checks that occur in processing midstream data.

Field Representative Quality

The APT Program Manager for the Midstream Lighting Program employs and oversees field personnel whose purpose is to engage distributors in the program. In PY4, APT hired one field representative. The APT Program Manager holds weekly standing conference calls with the field representative, and is also often in weekly contact through e-mail and phone with the field representative. The APT Program

Manager goes out into the field with the field representative once a quarter to monitor the field representative's performance and progress, and to ensure that processes are being carried out as intended. There are no other quality assurance or control procedures in place for monitoring the field representative. The program added a second field representative for PY5 but otherwise processes are not anticipated to change from PY4 to PY5.

Assessment: Monitoring and verification of field representatives is sufficient. We recommend developing formal documentation of all of the quality assurance and verification checks that may be developed in the future, especially if a greater number of field representatives are hired.

3.1.2   Tracking System Review

The Midstream Incentive Tracking Database included all program CFL sales invoiced after June 1, 2011. A number of data cleaning steps were taken to make sure PY4 bulb sales were complementary and non-overlapping with bulb sales attributed to PY3. A small number of bulbs sold in PY3 were counted as PY4 sales due to a delay in the invoicing of the bulbs and thus their exclusion from the bulbs counted as PY3 sales. The PY4 analysis dataset was finalized based on the most recent program tracking database received from ComEd (dated September 25, 2012). This dataset contained sales data for a 5,238 transactions (corresponding to the sale of 575,897 bulbs). Of these bulbs, 570,155 were found to have been sold during PY4, 5,097 were sold during PY3 but invoiced after the PY3 cutoff and so are counted as PY4 sales, and 645 bulbs that were included in the PY3 sales and so have been dropped. This resulted in a total of 575,252 program bulbs attributed to PY4.

3.1.3   Research Findings Gross Savings Parameter Estimates

Table 3-3 presents the parameter estimates used to calculate the PY4 Research Findings Gross Savings.

Table 3-3. Research Findings Gross Savings Parameter Estimates

Research Findings Savings Parameter	Standard	Specialty	High Wattage	Total
Total Bulb Sales	194,180	376,322	4,750	575,252
Delta Watts	50.9	49.6	115.9	50.6
HOU – Res / NonRes	12.7 / 11.3	12.7 / 11.3	12.7 / 11.3	12.7 / 11.3
Peak CF – Res / NonRes	0.58 / 0.62	0.58 / 0.62	0.58 / 0.62	0.58 / 0.62
Energy IE – Res / NonRes	0.98 / 1.17	0.98 / 1.17	0.98 / 1.17	0.98 / 1.17
Demand IE – Res / NonRes	1.07 / 1.39	1.07 / 1.39	1.07 / 1.39	1.07 / 1.39
Installation Rate	0.73	0.73	0.73	0.73
Leakage	0.02%	0.02%	0.02%	0.02%

Source: Navigant Evaluation Team Analysis of Tracking Data and End User Survey

3.1.4 Research Findings Gross Savings Estimates

Table 3-4 below provides the PY4 Research Findings parameter estimates (displaced watts, average daily hours of use, installation rate, leakage, and net-to-gross ratio), as well as the first-year gross and net savings estimates. The Research Findings savings estimates are derived from the evaluator's independent evaluation of these parameters, developed using data collected as part of the current evaluation. The values in this table are overall averages across all bulb types (standard, specialty and high wattage) and include an adjustment for bulbs believed to have been installed in residential locations.

Table 3-4. Research Findings Gross Savings Estimates

Gross and Net Parameter and Savings Estimates	PY4 Research Findings
CFLs Distributed through the Program	572,252
Average Displaced Watts (Delta Watts)	50.6
Average Daily Hours of Use (Res and Non-Res)	11.6
Gross kWh Impact per unit	214.5
Gross kW Impact per unit	0.05
Peak-Load Coincidence Factor	0.61
Total First-Year Gross Savings MWh Savings	**123,414**
Total First-Year Gross Savings MW Savings	**29.1**
Total First-Year Gross Savings Peak MW Savings	**17.8**
Installation Rate	0.73
Leakage	0.2%
Energy Interactive Effects[31]	1.13
Demand Interactive Effects	1.32
Total First-Year Gross Savings Installed MWh Savings	**101,230**
Total First-Year Gross Savings Installed MW Savings	**21.1**
Total First-Year Gross Savings Installed Peak MW Savings	**17.0**

Source: ComEd PY4 MSI Tracking Database, and Navigant Evaluation Team Analysis

Table 3-5 below compares the PY4 Ex Ante Gross and Research Findings Gross energy and demand savings estimate.

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[31] Interactive Effects on home temperature control load due to decreased waste heat from lighting.

Table 3-5. Gross Savings Estimates

Savings Estimate	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Unadjusted Gross	108,783	-	-
Ex Post Unadjusted Gross	123,414	29.1	17.8
Research Findings Adjusted Gross	101,230	21.1	17.0

Source: Navigant Evaluation Team Data Analysis

3.1.5 Research Findings Net Savings Program Impact Results

The sole impact parameter estimate used to calculate the Research Findings Net Savings was the Net-to-Gross ratio. As mentioned previously, the NTGR was calculated using a customer self-report method based on data collected during the end user telephone surveys. An overall NTGR estimate of 0.63 was applied to all program bulb types (the number of end user survey completes did not allow for the estimation of NTGR by program bulb type). Table 3-6 below provides the PY4 Research Findings Net Savings estimates for the PY4 Midstream Incentives Program.

Table 3-6. Research Findings Net Savings Estimates

Savings Estimate	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Net	45,689	-	-
Research Findings Net	63,358	13.2	10.7

Source: Navigant Evaluation Team Data Analysis

3.1.6 Research Findings Carryover Savings Estimates

The PY3 Midstream Incentive Pilot evaluation assumed an installation rate of 100% and thus there are no carryover savings in PY4. Based on PY4 sales and installation rates, however, it is possible at this time to estimate and begin to document the net energy savings resulting from PY4 late installs that will be counted in PY5 and PY6. As mentioned above, the net energy savings resulting from these late installations are calculated based on the Research Findings from the program year when the bulbs were sold and thus are in no way dependent upon the results of the PY5 or PY6 program evaluation. The first year installation rate for bulbs sold through the MSI program in PY4 was estimated to be 73%. Applying this installation rate to the 575,252 bulbs sold in PY4, and subtracting the bulbs estimated to have leaked out of ComEd's service territory, leaves a total of 156,687 bulbs remaining to be installed in PY5 and PY6[32].

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[32] Fifty percent of the remaining bulbs (78,344 bulbs) will be installed in PY5 and then the remaining 50% will be installed in PY6.

Table 3-7 below shows that the net savings from nearly 80,000 bulbs sold in PY4 may be attributed to PY5 and PY6, resulting in an estimated 11,885 MWh of net energy savings in these upcoming program years.

Table 3-7. Estimated PY5 and PY6 Evaluation Research Savings Carryover Energy Savings

Research Findings Savings PY5/PY6 Carryover Savings Estimate	Total Carryover in PY5 and PY6[33]
Program Bulbs Installed During PY5/PY6	78,344
Average Delta Watts	50.6
Average Daily Hours of Use	11.6
Gross kWh Impact per unit	214.5
Gross kW Impact per unit	0.05
Installation Rate	100%
Carryover Gross Energy Savings (MWh)	16,808
Carryover Gross Demand Savings (MW)	4.0
Energy Interactive Effects	1.13
Net-to-Gross Ratio	0.63
Carryover Net Energy Savings (MWh)	11,885
Carryover Net Demand Savings (MW)	2.5

Source: Navigant Consulting Team Analysis

3.2 Process Evaluation Results

The process evaluation of the PY4 Midstream Incentives Lighting Evaluation assessed the program processes impacting distributors and end use customers who participated in the program. On the distributor side, we explored their satisfaction with the program, challenges and barriers to participation, and their recommendations for program improvement. For end users, we examined the reach of program marketing , types of participating end users, usage of CFLs and purchasing decisions, awareness of bulb types, federal regulatory changes, program discounts, and satisfaction and barriers to purchasing CFLs. Data sources for the process evaluation include the distributor surveys (n=11) and the end user telephone survey (n=51).

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[33] This column represents the estimated saving from the uninstalled PY4 bulb in PY5 and PY6. Since half of the PY4 uninstalled bulbs are estimated to be installed in PY5 and the other half in PY6, the estimated carryover energy savings is the same for the two years (11,885 MWh of carryover savings in each year).

3.2.1   End User Types

Based on the final customer database, the evaluation team estimated 21% of purchases were made by customers who owned or managed condominiums or apartment buildings, eight percent by office or realty buildings, nine percent by hotels or motels, and 10% made by construction, industrial, or auto/gas customers. The evaluation team was unable to estimate the customer type based on data contained in the participant database for roughly 24% of the program bulbs sold in PY4.

Both the end user survey data as well as distributor feedback helped to verify these common end user types. The survey contained slightly different categories but found that 21% of customers reported that their lighting purchases were made for office buildings, 18% for real estate/building management purposes, and about 12% were classified as apartments/condominiums. Additionally, while almost all distributors reported serving a wide variety of commercial customers through the program, many reported that condominiums, apartment buildings, and office or realty buildings were their typical program customers. One distributor reported that almost 100% of their program sales went to the multifamily market (condominiums and apartment buildings). Another said it was more common for small or medium sized businesses to purchase the discounted bulbs. Three other distributors said that many of their program sales were purchased by hotels and hospitals.

3.2.2   Program Recruitment and Marketing

Distributors learned about the program through several channels. Four out of eleven distributors said that program staff reached out to inform them about the program, three distributors reported that the implementer, APT, informed them about the opportunity, two distributors said they couldn't recall, one distributor said that other lighting suppliers informed him, and one distributor said they reached out to ComEd themselves to learn about what was available. Most distributors said the primary reason they got involved with the program was to help expand their business into new product categories and "get in the door" with customers that they typically wouldn't have been able to reach. One distributor in particular said "We think it's a terrific opportunity for our customers if we accelerate their purchase of energy efficient lighting products."

Of the 11 distributors interviewed, six reported receiving marketing materials from ComEd, such as case studies, catalogues, fliers, or counter mats. Seven out of eleven distributors said they would have liked to receive more marketing materials that they could in turn use to sell the program to their customers. Seven distributors said that they used the availability of the discount as a marketing tool to encourage their customers to purchase the bulbs.

Table 3-8 below highlights how end users first found out about the price discounts offered by their distributor for the screw-in CFLs. Just over three-quarters (77%) said that their distributor made them aware of the discounted bulbs while a small number learned about the discounts through in-store marketing materials or mailings.

Table 3-8. Where Customers Learned About Discount

First Found out About ComEd Discount	% of End Users
Distributor Informed Them	77%
Other	8%
Email	5%
Don't Recall	5%
Saw Marketing Materials In Store	3%
Mailing	3%

Source: PY5 MSI End Use Customer Survey
Percents do not sum to 100% to due to rounding.

Most (nine of 11) distributors reported that their customers knew the bulbs were discounted, and that ComEd was the source of the bulb discount. Two distributors said that most of their customers were likely not aware that the bulbs were discounted.

Nearly two-thirds of end use customers (65%) were exposed to informational materials from ComEd explaining the energy savings benefits of screw-in CFLs. Table 3-9 highlights how end users were exposed to the informational materials. Twenty-one percent said they received the materials as a bill insert while 15% cited other non-specific mailings and nine percent specified email. Eighteen percent saw the information online. Distributors provided the information to 15% of customers.

Table 3-9. Presence of Marketing Materials

First Saw Marketing Materials	% of End Users
Bill Inserts	21%
Online	18%
Non-Specific Mailings	15%
Distributor	15%
Email	9%
Brochure	9%
Other	6%
On Sales Counter	3%
Don't Know	3%

Source: PY5 MSI End Use Customer Survey
Percents do not sum to 100% to due to rounding.

We asked distributors about CFL recycling. Most distributors (nine out of 11) said that ComEd did not provide them with support to market the availability of recycling opportunities for CFLs. However, eight of the 11 distributors said that they offer their own recycling programs through their company for their customers.

3.2.3   End User Awareness of Bulb Types

Most end use customers said they were familiar with CFLs prior to making their program bulb purchases. The majority (57%) was very familiar, and 31% said they were somewhat familiar with CFLs (see Table 3-10). A smaller percentage said they were not too familiar (8%) or not at all familiar (4%) with CFLs.

Table 3-10. End User Familiarity with CFLs Prior to Purchase Through Program

Familiarity	% of End Users
Very familiar	57%
Somewhat familiar	31%
Not too familiar	8%
Not at all familiar	4%

Source: PY5 MSI End Use Customer Survey

Few end use customers were new users of CFLs and many customers already had CFLs in most of their sockets. Only eight percent of customers said that none of their sockets contained CFLs prior purchasing CFLs through the program (see Table 3-11). Approximately one-third (34%) percent of customers had CFLs installed 75% or more of their sockets prior to purchasing the program CFLs.

Table 3-11. End User Usage of CFLs Prior to Program

Percent of Sockets with CFLs Prior to Program	% of End Users
All of the sockets	6%
More than 75% of the sockets, but not all sockets	28%
More than 50% but less than 75%	14%
More than 25% but less than 50%	6%
More than 5% but less than 25%	18%
Less than 5% of sockets	12%
Don't recall	10%
None of the sockets	8%

Source: PY5 MSI End Use Customer Survey
Percents do not sum to 100% to due to rounding.

We also asked whether customers were familiar with screw-in LEDs that can be used to replace standard light bulbs. Approximately two-thirds (73%) said they were familiar with the bulbs, though only 41% of those familiar (29% of all end use customers) report having purchased and installed screw-in LED bulbs in their businesses.

Three distributors reported that end users who purchased bulbs through the program are very familiar with the concept of lumens, three reported the end users are somewhat familiar, two reported that end users are not very familiar, and two did not know. One distributor reported that knowledge of lumens is varied across their customers with larger corporations being more aware than smaller businesses. Another distributor said that since the types of people that purchase the bulbs from them are typically engineers, they are, for the most part, familiar with lumens. A different distributor reported that the contractors that purchase bulbs from them typically look for the watt equivalent and often do not consider lumens.

Over half (seven of 11) distributors said that the end users typically look to them to help determine what wattage bulbs to purchase. One distributor reported that national chains usually do not need guidance, but smaller customers may need to be given direction.

3.2.4 End User Purchasing Decisions

Energy efficiency is not the prime consideration for end use customers when deciding what screw-in bulbs to purchase for their business. Table 3-12 highlights the basis of end user purchasing decisions. Equal numbers decide based on wattage and price (28%). A smaller percentage (14%) said they make their selection based on energy efficiency.

Table 3-12. Basis for End User Purchase Decisions

End User Purchase Decisions	% of End Users
Based on what I need (type, wattage)	28%
Based on price	28%
Based on energy efficiency	14%
Based on the bulb type already in the fixture	12%
Based on Sales Rep or other recommendation	12%
Typically buy CFLs	4%
Based on what is on sale	4%

Source: PY5 MSI End Use Customer Survey
Percents do not sum to 100% to due to rounding.

We asked distributors who did the purchasing for most of their program customers. The most common purchaser of bulbs through the program was the facility engineer or maintenance person (mentioned by seven of 11 distributors as the primary or one of the primary purchasers). However, seven distributors suggested that there are a variety of purchaser types. Common purchasers include the management company, owners or general managers, or purchasing departments.

Distributors said that their customers place orders in a variety of ways. All 11 distributors reported providing the option to call in an order over the telephone. About half (six of 11), also said that they offer over the counter purchasing options. Three distributors reported using the door-to-door method to allow customers to place orders. Others reported offering customers a mix of e-mail, fax, and internet to place orders. Most (10 of 11) distributors said that they do not have standing orders or contractor orders. One distributor said that they do offer contracts to end users where they negotiate pricing for a period of time and then they place their orders on an as-needed basis. Another distributor reported that while they do not have standing orders or contractors, they do have customers with budgets that they need to spend on lighting each month. One distributor reported that the reason they no longer have standing orders is because "nobody stocks up on anything anymore in this economy."

3.2.5   Use of Purchased CFLs

Slightly over one-third of end use customers (35%) have installed all of the CFLs they purchased through the program. Just over half of customers (54%) have installed at least 80% of the bulbs. Of the bulbs installed, close to half of customers (46%) reported that they replaced incandescents or mostly incandescents (see Table 3-13) with the bulbs. Just over one-quarter (26%) said the program bulbs replaced all CFLs or mostly CFLs. Another 20% said the program CFLs replaced a mixture of bulb types.

Table 3-13. Type of Bulbs CFLs Replaced

Bulb Type(s)	% of End Users
All incandescents	28%
Mostly incandescent	18%
Half incandescent and half CFLs	6%
All CFLs	8%
Mostly CFLs	18%
Mixture of bulbs	20%
Halogens	2%

Source: PY5 MSI End Use Customer Survey

A majority (58%) of end users said that, to their knowledge, all the programs CFLs that they installed were still in place, and about a third (36%) said that some have been removed. The remaining 6% did not know if all of the bulbs were still installed. We asked customers why they removed the bulbs and the majority (72%) said the bulbs burned out or stopped working, and 17% said the bulbs were not bright enough (see Table 3-14).

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Table 3-14. Reasons for CFL Removal

Reasons for Removal	% of End Users
Burned out/stopped working	72%
Not bright enough	17%
Took too long to start up	6%
Didn't fit in the fixture	6%

Source: PY5 MSI End Use Customer Survey
Percents do not sum to 100% to due to rounding.

We asked the 13 end users who purchased the discounted bulbs for use in apartments, condos, hotels, or motels, where in their buildings they had installed the bulbs. Eight of the thirteen said that they were installed in a common space, such as a hallway, stairs, or lobby. Four end users reported that the CFLs were installed in a private space such as tenants' units or guest rooms. Two end users said that, on average, the CFLs installed in the common areas are turned on during summer weekday afternoons. Additionally, two end users said that some of the CFLs are controlled by occupancy or motion sensors.

3.2.6   End User Awareness of Regulatory Changes

A majority (61%) of end users report being aware of the EISA 2007 federal light bulb regulations that began in January of 2012. Close to two thirds (69%) of all end users reported that they do not believe the new regulations will impact the lighting products their organization installs in their businesses.

Four distributors reported that their customers are somewhat aware of the EISA regulations. Four other distributors reported that their customers have become increasingly aware of the new regulation within the last year. These distributors believe that customer awareness will continue to grow in 2012 and 2013 as the inventories of products that do not meet the regulation become depleted. Two distributors said that whether the customer is aware of the regulation depends on the customer type (e.g. hotels report being very familiar with what they must purchase to meet the regulations).

Most distributors said that their customers' purchasing decisions are slowly changing due to the lighting regulations. Two distributors said that customers are not stockpiling incandescent bulbs because they are not spending money unless they have to. Two different distributors said that customers are slow to react, and that they will likely "go right down to the wire" to avoid thinking about it until they have to. One distributor said that their customers are definitely "veering more towards incandescents" because they will not be in stock for much longer. Two distributors said they are only seeing a little bit of change in their customers purchasing behaviors to date. When asked how the bulbs they stock and sell have changed because of the regulations, almost all distributors (10 out of 11) said they now stock mostly compliant bulbs to meet the new regulations.

3.2.7   End User Satisfaction with CFLs Purchased

As Table 3-15 shows, the majority of end users were satisfied (84%) with the CFLs that they purchased. Only one respondent gave a score indicating he was dissatisfied with the bulbs. This respondent cited a delay when the lights turned on as his reason for dissatisfaction with the CFLs.

Table 3-15. Satisfaction with CFLs Purchased

Satisfaction with CFLs Purchased	% of End Users
Satisfied (7-10)	84%
Neither Satisfied or Dissatisfied (4-6)	16%
Dissatisfied (0-3)	2%
Mean Score	7

Source: PY5 MSI End Use Customer Survey
Percents do not sum to 100% to due to rounding.

3.2.8   Distributor Satisfaction with Program

Eight distributors said they were extremely satisfied or very satisfied with the program enrollment process. One distributor suggested that the list of products that are included in the program needs to be defined earlier in the program year to ensure that the enrollment process is smoother. The majority of distributors (six of 11) reported being very satisfied with the program tracking and verification process. One distributor said that the tracking and verification process was not very compatible with the way that their own system is set up. Another distributor said that they were not satisfied at all because they felt too much paperwork was required. Eight distributors were extremely satisfied or very satisfied with the incentive processing time, and one distributor thought the process could be quicker.

All distributors report having a mix of long-standing and new customers, with several distributors suggesting that the rebate program has helped them to identify new customers. One distributor reported that "We've been in business 37 years, we have a lot of long-term accounts, but we were able to open up a lot of new accounts with this program." Overall, most distributors reported being very satisfied with the sales the program generated for their business. One of the distributors reported being somewhat satisfied with the sales of discounted CFLs, but said that they as a company could have done a better job of marketing internally. Two distributors said they were not very satisfied with the sales the discounted CFLs generated for their business, but both reported that their dissatisfaction was not due to the program itself and instead was due to CFLs not being the primary focus of their business.

Most distributors were satisfied with the amount of the incentives offered on the CFLs in PY4 and felt that the incentives were sufficient to induce customers to purchase those CFLs instead of incandescent bulbs. Distributors noted that this was especially true when the incentives were raised on all CFL bulb types during the second half of PY4.

Nearly all the distributors interviewed reported being very satisfied or extremely satisfied with the program managers and other staff. Similarly, nearly all distributors interviewed reported being very satisfied or extremely satisfied with the program, with one distributor noting that "It's a really good program and it's structured well, and, in my mind at least, it's accomplishing what it set out to do." Most distributors reported that the expansion of the program in PY5 to linear fluorescent bulbs, metal halide bulbs, and LEDs would positively influence their program sales in some way. One distributor predicted that their LED sales will be growing a lot faster in PY5 because of the program. Another

distributor said that the newly introduced lighting products are still a small percentage of their overall sales, but that the program would definitely help to increase those sales. One distributor reported that the cost of LEDs is still too high, even with the discount, to encourage customers to switch from other lighting technologies, such as incandescent bulbs.

Most distributors felt that a reduction of the incentives on the standard, specialty, and high watt bulbs in PY5 would likely not have a negative effect on their program sales. One distributor reported that the CFLs incentives will not be as enticing to the customer. Another distributor reported that the reduction in the incentives for these bulb types would definitely have a negative impact on their program sales.

3.2.9   Barriers to CFL Use

One-third of end users (33%) have purchased regular incandescent bulbs for use in their business since June of 2011. As Table 3-16 shows, one-third (35%) purchased incandescents instead of CFLs because of the high cost of CFLs. Nearly one-quarter of incandescent purchasers (24%) said the light quality of CFLs was a significant reason for purchasing incandescents instead of CFLs. Dissatisfaction with past CFLs and the look of CFLs in fixtures was a significant factor in why 18% purchased incandescent bulbs after June of 2011. Approximately one in ten (12%) purchased incandescents because CFLs were not bright enough. A small number (6%) cited the fact that CFLs contain mercury as a significant reason for purchasing incandescent bulbs.

Table 3-16. Barriers to CFL Purchase

Reasons for Purchasing Incandescents Instead of CFLs	% Significant Reason (n=17)
CFLs are too expensive	35%
Do not like the light quality of CFLs	24%
Dissatisfied with past CFLs	18%
Do not like the look of CFLs in light fixture	18%
CFLs are not bright enough	12%
Don't like that CFLs contain mercury	6%

Source: PY5 MSI End Use Customer Survey
Note: Question asked respondent to rate significance of each reason on a 0 to 10 scale where 0 is "not at all significant and 10 is "very significant". The percentages reported here are those who gave a rating of 8, 9 or 10.

3.2.10   Distributor Barriers and Challenges to Participation

Distributors were asked whether there were any program requirements that made it challenging to participate. One distributor felt that ComEd should have decided sooner on what products qualify for the program. Similarly, another distributor said that they came across challenges with qualifying products for the program because manufacturers sometimes change their part numbers when they upgrade them, which in turn means that the distributor will have to work with the program to try to qualify those products. Another distributor said that the program has become less restrictive over time

about the type of products that are allowed to qualify for the program, which in turn has made it easier for them to offer qualifying products to their customers. Another distributor reported that the program tracking and verification process is difficult in that it requires a lot of information and is very time intensive. Finally, one distributor noted that there was an initial challenge with ensuring that eligible participants were the only customers that received rebates through the program, but noted that they were able to work successfully with ComEd staff to mitigate that risk.

3.2.11 Distributor Recommendations for Program Improvement

We asked distributors for recommendations on how the program could be improved. One distributor recommended that ComEd develop more branded marketing materials for distributors to use to help them promote the program to their customers. Two distributors said that they were hoping to find creative ways to market the program more effectively with the support of the program implementer, such as developing a more robust door-to-door network to spread the message about the program to as many potential customers as possible. Three distributors recommended offering larger discounts as a way to increase customer participation. One distributor recommended improving the incentive processing time, and another recommended improving the program reporting process. Finally, one distributor strongly recommended that ComEd decide on the list of qualifying products to include in the program as early as possible in future program years in order to ensure that all the products that should be included in the program are included.

4. Findings and Recommendations

4.1 Key Impact Findings and Recommendations

The following list summarizes the key impact findings from the PY4 evaluation:

- **Tracking Data Issues:**
  Finding. Tracking data is missing for several key elements necessary for program impact estimation and evaluation.
  Recommendation. In PY5, a requirement for participation in the Midstream Incentives Program is for each lighting distributor to provide detailed customer contact information along with the program sales data. This information will greatly improve the ability to evaluate this program by allowing for a larger sample of program participants to be interviewed about their experience with the program. In addition to this contact information, the business type of the end users purchasing the bulbs would improve the accuracy in which hours-of-use, peak coincidence factors and interactive effects are assigned. To accurately determine delta watts the tracking data should also include program bulb lumen output and specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.) All of these variables are critical to estimate program impacts and should be verified for accuracy. The evaluation team also recommends including retail sales price on a record-by-record basis in the tracking data. This would allow for a more robust analysis of customer purchasing decisions based on bulb cost. The program is encouraged to continue to remind distributors about the need to provide ComEd with contact information of customers that receive program rebates and assess throughout the program year that this data is being collected appropriately.

- **Delta Watts Estimation:**
  Finding. The PY4 delta watts approach used in the Goals Tracker mapped all CFLs, regardless of bulb type, to a single base wattage.
  Recommendation. The evaluation team recommends switching to a bulb-type lumen mapping (such as the one presented within this evaluation report that is based on the new Energy Star draft specification for lamps). Using a lumen-based method that also relies on bulb shape provides a more robust means of establishing base wattage equivalents across all bulb types, especially specialty CFLs and LEDs. Because lumen output is a measure of the total light produced in all directions from a source, bulbs such as reflectors (and LEDs in general) that focus light in a single direction require a different lumen mapping than a standard CFL. The TRM that goes into effect in PY5 assigns base-wattages using lumen bins that are not differentiated by bulb type (except for LEDs) and thus this issue continues under the PY5 TRM.

- **Residential vs. Non-Residential and Residential In-Unit vs. Common Space Installations:**
  Finding. Currently there is no deemed Residential versus Non-Residential installation location split, nor is such a split included in the PY5 Technical Resource Manual for Commercial Lighting

programs.[34] This commercial lighting program is unique in that a high percentage of program bulbs are sold to residential apartment buildings, condominiums, or Co-Ops, and then installed in either residential units or common areas. Based on PY4 program tracking data and data collected during the end user telephone surveys, the evaluation team estimated that more than 20% of PY4 MSI program bulbs were being installed in residential buildings, three-quarters of which were common area installations and the remaining were in-unit installations[35].
Recommendation. The evaluation team believes that due to the large impact both the Res/NonRes split and the residential in-unit versus common area installation can have on the resulting program impact estimates, this parameter should be estimated again in PY5 with a larger sample of customers. Deeming the residential in-unit versus common area split may be appropriate if it appears to have a relatively stable distribution, however the split between the various commercial business types (including residential) should be evaluated each year based on program tracking data.

- **Installation Rate:**
  Finding. In PY4 the overall installation rate was found to be 73% based on the Research Findings. This installation rate was disaggregated by both bulb type and quantity of program bulbs purchased by end-user and correlations seem to exist (standard bulbs had higher installation rates than high wattage or specialty bulbs, and end users purchasing fewer than 50 bulbs had higher average installation rates than those purchasing 50 or more bulbs). Unfortunately, due to small end-user survey sample sizes the differences found were not statistically significant.
  Recommendation. The evaluation team recommends that ComEd ensures the end-user contact information is available for PY5 sales so that a larger end-user telephone survey can be conducted allowing for correlations between bulb type and quantity of program bulbs purchased (as well as potentially other segmentation variables, such as end user business type) to be evaluated in a robust and multifaceted manner. Additionally, the IL TRM that goes into effect in PY5 applies the ISR assumptions for Residential Lighting (69.5% in first year, 15.4% in 2nd year and 13.1% in final year) to C&I lighting programs. As the TRM points out, these installation rate patterns were not determined based upon C&I evaluations and are being used for C&I until a more appropriate evaluation in this area is performed. A larger end-user sample is necessary to evaluate such assumptions.

- **Net-to-Gross Estimation:**
  Finding. This program has not been evaluated before and so according to the NTG Framework[36] the NTGR is to be applied retroactively for PY4. The NTGR for the PY4 MSI program was

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[34] The PY5 TRM for Residential Lighting Programs states "If the implementation strategy does not allow for the installation location to be known (e.g. an upstream retail program), evaluation data could be used to determine and appropriate residential v commercial split". A similar statement may also be appropriate within the commercial lighting section of the PY5 TRM.

[35] Program bulbs installed into common area within a residential building should be considered non-residential installations from a program spending perspective. Considering this only 5.5% of program bulbs should be considered residential installations.

[36] "Proposed Framework for Counting Net Savings in Illinois." Memorandum March 12, 2010 from Philip Mosenthal, OEI, and Susan Hedman, OAG.

estimated to be 0.63[37] based on applying a customer self-report method to data gathered during the end user telephone surveys. While this estimate may be lower than expected, the Supplier Self-Report NTGR estimate of 0.56 is regarded as a directional indicator to give context to the Customer Self-Report NTGR. Distributors generally indicated that they had already been selling these types of lighting products for a number of years prior to the program and that sales had been steadily increasing. As such, they said it was somewhat difficult for them to disaggregate the impacts of the program from their general sales trends. Similarly, 50% of end user survey respondents said they had purchased CFLs from their distributor prior to the program, and 26% reported the CFLs they bought through the program replaced all or mostly CFLs. Another 6% said they replaced half CFLs and half incandescents, and 20% said they replaced a mixture of bulb types. All of these findings support NTGR estimates substantially less than 1.0.

The NTG analysis performed in PY4 indicated a correlation between the quantity of program bulbs purchased (which varies widely across program participants from 1 to 5,000) and type of bulb purchased (standard, specialty and high wattage). NTGR also appears to vary by customer business type, with some C&I segments more likely to buy efficient lighting products in the absence of incentives than others.

Recommendation. The PY4 evaluation of NTGR was constrained by the small sample of customers the evaluation team was able to conduct telephone surveys with due to limited contact information. The evaluation team recommends working closely with program distributors to ensure end user contact data is available to the evaluation team in order to increase the robustness and segmentation used to evaluate the MSI NTGR in PY5. Larger samples of program participants will also allow for the evaluation of NTGR by bulb type, which will assist ComEd in altering product offerings or incentives, if necessary, and evaluating NTGR by business type could possibly assist ComEd and program distributors targeting various business types which are less likely to use CFLs. Because the majority of distributors interviewed indicated CFL sales are a very small percentage of their overall retail sales, the evaluation team recommends that ComEd or the program implementer request pre-program CFL sales data from each of the distributors. This would allow for the estimation of a data driven baseline from which to calculate the sales lift of screw-in CFLs in PY5 that are in large part attributable to the program.

4.2   Key Process Findings and Recommendations

The following list summarizes the key program process findings and recommendations from the study:

- **Program Satisfaction:**
  Finding. Distributors are generally satisfied with the program; however they have had some initial difficulty understanding what products qualify. Nearly all the distributors interviewed reported being very satisfied or extremely satisfied with the program managers and other staff. Additionally, most distributors reported being very satisfied with the sales the program generated for their business. Ten out of eleven distributors credit the program with increasing their business and sales of CFLs. Most distributors reported that the expansion of the program in PY5 to linear fluorescent bulbs, metal halide bulbs, and LEDs would positively influence their program sales in some way. End-users also reported high levels of satisfaction, with the majority

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[37] The 90% confidence interval on the Customer Self-Report NTGR estimate is +/- 3% (0.59 to 0.66).

(84%) reporting they were satisfied or very satisfied with the CFLs that they purchased through the program.

Recommendation. The evaluation team recommends that ComEd develop the list of qualifying products for each program year as soon as possible. Some distributors recommended developing this list sooner than the program has in the past because of amount of time it takes to ensure that all lighting products offered adhere to the requirements of the program.

- **Familiarity with Efficient Lighting Options:**
  Finding. Eighty-eight percent of end users reported that they were either very familiar or somewhat familiar with CFLs prior to purchasing them. Only a few end use customers were new users of CFLs and many customers already had CFLs in most of their sockets (only eight percent reported having no CFLs installed prior to purchasing program CFLs and a third reported they had CFLs installed in 75% or more of their sockets prior). Additionally, two-thirds of end users reported being familiar with screw in LED light bulbs, although few had any installed (29%). So while familiarity with efficient lighting was quite high, it was interesting to note that energy efficiency was not the prime consideration for end use customers when selecting screw-in bulbs to purchase for their business. Equal numbers decide based on wattage and price (28%) and a much smaller percentage (14%) said they make their selection based on energy efficiency. At the same time the most common barrier to purchasing CFLs was that they were too expensive.
  Recommendation. ComEd is encouraged to consider developing and sharing enhanced marketing and education materials with distributors to help them better promote the program and the energy savings resulting from switching to CFLs to customers. Many of the distributors interviewed said they received a minimal amount of marketing materials from ComEd, and at least one distributor recommended developing enhanced ComEd-branded materials to help them promote the program. Developing marketing materials that illustrate the net customer savings resulting from installing CFLs can help convince business customers that CFLs are a technology worth investing in.

- **EISA Awareness:**
  Finding. A majority of customers (61%) reported that they are aware of the change in federal light bulb regulations due to EISA. Just over two-thirds of (69%) of all customers reported that they do not believe the new regulations will impact the lighting products their organization installs in their businesses. Most distributors said that their customers' purchasing decisions are slowly changing due to new lighting regulation.
  Recommendation. ComEd should consider using EISA 2007 to educate customers about CFLs and other efficient lighting products, as well as proper replacement of efficient lighting. Commercial customers are typically more informed than residential customers about existing regulations and proper replacement of efficient lighting. While most commercial customers report being aware of EISA 2007 and do not believe the new regulations will impact the lighting products their organization installs, there is still a need to ensure that as many commercial customers are educated about proper disposal practices as possible. ComEd should consider working with participating distributors to develop effective techniques and educational materials to continue to educate customers about efficient lighting replacements.

- **CFL Recycling:**
  Finding. Most distributors interviewed reported that ComEd did not provide them with any support to encourage environmentally safe recycling and disposal of CFLs. The majority reported that they already offer recycling opportunities to their customers, but some said they would like to find ways to work with ComEd to make their commercial customers more aware of ways to recycle CFLs.
  Recommendation. The evaluation team recommends that ComEd work with distributors to ensure that effective CFL disposal practices for commercial customers are in place.

5. Appendix

5.1 *Glossary*

High Level Concepts

Program Year
- EPY1, EPY2, etc. Electric Program Year where EPY1 is June 1, 2008 to May 31, 2009, EPY2 is June 1, 2009 to May 31, 2010, etc.
- GPY1, GPY2, etc. Gas Program Year where GPY1 is June 1, 2011 to May 31, 2012, GPY2 is June 1, 2012 to 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 EPY4/GPY1 ComEd's deemed parameters were defined in its filing with the ICC. The Gas utilities agreed to use the parameters defined in the TRM, which came into official force for EPY5/GPY2.

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 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[38].

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)**

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

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 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.

5.2 Impact Evaluation Research Findings

5.2.1 Summary of Impact Evaluation Research Findings

As noted in the main body of the report, the goal of the Midstream Incentives Lighting Program for PY4 was to sell 225,000 discounted CFLs to nonresidential customers within ComEd's service territory. A total of 194,180 standard CFL bulbs, 376,322 specialty CFL bulbs and 4,750 high wattage CFL bulbs were sold as part of the PY4 program for a grand total of 575,252 bulbs.[39]

Table 5-1 below provides the Research Findings gross and net savings parameter estimates (displaced watts, average daily hours of use, installation rate, leakage, and net-to-gross ratio), as well as the first-year gross and net savings estimates. The Research Findings savings estimates are derived from the evaluator's independent evaluation of these parameters, developed using data collected as part of the current evaluation. The values in this table are overall averages across all bulb types (standard, specialty and high wattage) and include an adjustment for bulbs believed to have been installed in residential locations.

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[39] These figures include 5,097 bulbs (3,973 standard bulbs, 1,074 specialty and 50 high wattage bulbs) sold during PY3 but invoiced after July 20th 2011 and thus not included in the PY3 program sales totals. For evaluation purposes these bulbs will be counted as PY4 bulbs.

Table 5-1. PY4 Research Findings Program Savings

Gross and Net Parameter and Savings Estimates	PY4 Research Findings
CFLs Distributed through the Program	572,252
Average Displaced Watts (Delta Watts)	50.6
Average Daily Hours of Use (Res and Non-Res)	11.6
Gross kWh Impact per unit	214.5
Gross kW Impact per unit	0.05
Peak-Load Coincidence Factor	0.61
Total First-Year Research Findings Gross MWh Savings	123,414
Total First-Year Research Findings Gross MW Savings	29.1
Total First-Year Research Findings Gross Peak MW Savings	17.8
Installation Rate	0.73
Leakage	0.2%
Energy Interactive Effects[40]	1.13
Demand Interactive Effects	1.32
Total First-Year Research Findings Gross Installed MWh Savings	101,230
Total First-Year Research Findings Gross Installed MW Savings	21.1
Total First-Year Research Findings Gross Installed Peak MW Savings	17.0
Net-to-Gross Ratio	0.63
Total First-Year Research Findings Net MWh Savings	63,358
Total First-Year Research Findings Net MW Savings	13.2
Total First-Year Research Findings Net Peak MW Savings	10.7

Source: ComEd PY4 MSI Tracking Database, and Navigant Evaluation Team Analysis

Table 5-2 below provides the PY4 bulb sales, net MWh savings estimates and resulting realization rates for the Program Target, the Program Reported, and Research Findings.[41] As this table shows the PY4 program reported ex-ante net energy savings for this program, excluding carryover, was estimated to be

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[40] Interactive Effects on home temperature control load due to decreased waste heat from lighting.
[41] As stated previously the Verified and Research Findings are the same since there were no deemed impact parameters for this program in PY4.

45,689 MWh. The Net Research Findings Savings were estimated to be 62,709 MWh[42] resulting in a net energy saving realization rate on the program reported savings of 139% for the bulbs sold and installed in PY4.

Table 5-2. PY4 Bulb Sales and Net MWh Savings Comparison

Estimate	PY4 Bulb Sales	Net MWh Savings Estimate
Program Target	225,000	19,979
Program Reported	579,351	45,689
Research Findings	575,252	63,358

Source: Navigant Evaluation Team Analysis

5.2.2 Research Findings Estimated Gross Savings Parameters

5.2.2.1 *Program Bulb Distribution*

The number of bulbs distributed through the program is a key parameter in the calculation of gross and net program impacts and is used to extrapolate the per-bulb savings estimates to the program level. Table 5-3 shows the spread of bulb sales across the three primary bulb types. As this table shows, specialty bulbs accounted for 65% of the CFL sales and 87% of the incentives for the program year.

Table 5-3. PY4 Program Bulb Distribution

Bulb Type	CFL Sales		Incentives Paid	
Standard	194,180	34%	$254,501	12%
Specialty	376,322	65%	$1,837,001	87%
High Wattage	4,750	1%	$23,468	1%
Total	575,252	100%	$2,114,970	100%

Source: Navigant Evaluation Team Analysis of Program Tracking Data

Table 5-4 below provides the total number of CFLs sold (standard, specialty, and high wattage) through the program by bulb wattage grouping. More than 80% of the bulbs sold through the program were low-wattage bulbs (15-watts or less), and more than 90% of the high wattage bulbs sold through the program were in the 40 to 42-watt range.

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[42] Excluding PY2 and PY3 carryover savings.

Table 5-4. Distribution of Program Bulbs by Wattage Group

Program Bulb Wattage Group	Standard Bulbs		Specialty Bulbs		High Wattage		Total	
	Bulbs Sold	% of Sales	Bulbs Sold	% of Sales	Bulbs Sold	% of Sales	Bulbs Sold	% of Sales
2 - 12 Watts	5,689	3%	40,232	11%	0	0%	45,921	8%
13 - 15 Watts	150,103	77%	267,278	71%	0	0%	417,381	73%
16 - 22 Watts	7,443	4%	50,182	13%	0	0%	57,625	10%
23 - 40 Watts	30,945	16%	18,630	5%	0	0%	49,575	9%
40 - 42 Watts	0	0%	0	0%	4,403	93%	4,403	1%
43 – 200 Watts	0	0%	0	0%	347	7%	347	0%
Total	194,180	100%	376,322	100%	4,750	100%	575,252	100%

Source: Midstream Incentive Tracking Data

Table 5-5 below provides the distribution of PY4 program bulbs by bulb and specialty type. As this table shows the top selling specialty products were A-lamps, globes, and reflectors. Combined these bulb types (including dimmable varieties) made up 64% of the entire PY4 program.

Table 5-5. Distribution of PY3 Program Bulbs by Bulb Type

Program Bulb Type	Program Bulb Specialty Type	Bulbs Sold	% of Program Sales
Standard	Spiral	194,180	34%
Specialty	3-Way	755	0%
	A-Lamp	219,694	38%
	Bullet	30	0%
	Candelabra	7,472	1%
	Dimmable A-Lamp	21,900	4%
	Dimmable Reflector	3,677	1%
	Dimmable Spiral	1,090	0%
	Globe	66,638	12%
	Reflector	55,066	10%
High Wattage	Spiral	4,750	1%
Total	Total	575,252	100%

Source: Midstream Incentive Lighting Tracking Data

Table 5-6 shows the distribution of PY4 sales by package size. Single bulbs accounted for 64% of total program sales and 75% of program incentives. While it seems counterintuitive that single packs would make up the bulk of a midstream program, distributors often sell entire cases of single bulb packs. While single packs made up the majority of total sales, on average the largest volume transactions were multipack sales. For instance, the average number of bulbs sold per transaction for single packs was 84 versus 628 bulbs per transaction for 18-packs. Ten-packs and 12-packs also made up a substantial portion of program sales (12% and 21%, respectively). Interestingly, although 12-packs accounted for nearly twice the program sales as 10-packs, 10-packs received nearly double the incentive amount. This is due to the fact that the majority of 12-packs sold were standard bulbs whereas the majority of 10-packs were specialty bulbs, which receive higher incentives.

Table 5-6. Distribution of PY4 Sales by Package Size

Distributor	Transaction Count		CFL Sales		Avg Bulbs/ Transaction	Incentives Paid	
1 Bulb Per Pack	4,360	84%	365,336	64%	84	$1,576,528	75%
2-3 Bulbs Per Pack	5	0%	1,162	0%	232	$2,170	0%
10 Bulbs Per Pack	230	4%	68,210	12%	297	$340,450	16%
12 Bulbs Per Pack	590	11%	122,328	21%	207	$173,052	8%
18 Bulbs Per Pack	29	1%	18,216	3%	628	$22,770	1%
Total	5,214	100%	575,252	100%	110	$2,114,970	100%

Source: Evaluation Team analysis of PY4 ComEd MSI Tracking data

Figure 5-1 below presents the distribution of program bulbs sales by month and bulb type (standard, specialty and high wattage). For standard bulbs, there was a spike in sales in April 2012. The sales rate of specialty bulbs also rose steadily over the course of the program year, with sales in the second half nearly 20 times higher than in the first half of the year. High wattage sales remained a very low percentage of the sales throughout the program year.

Figure 5-1. Program Bulb Sales by Month and Bulb Type
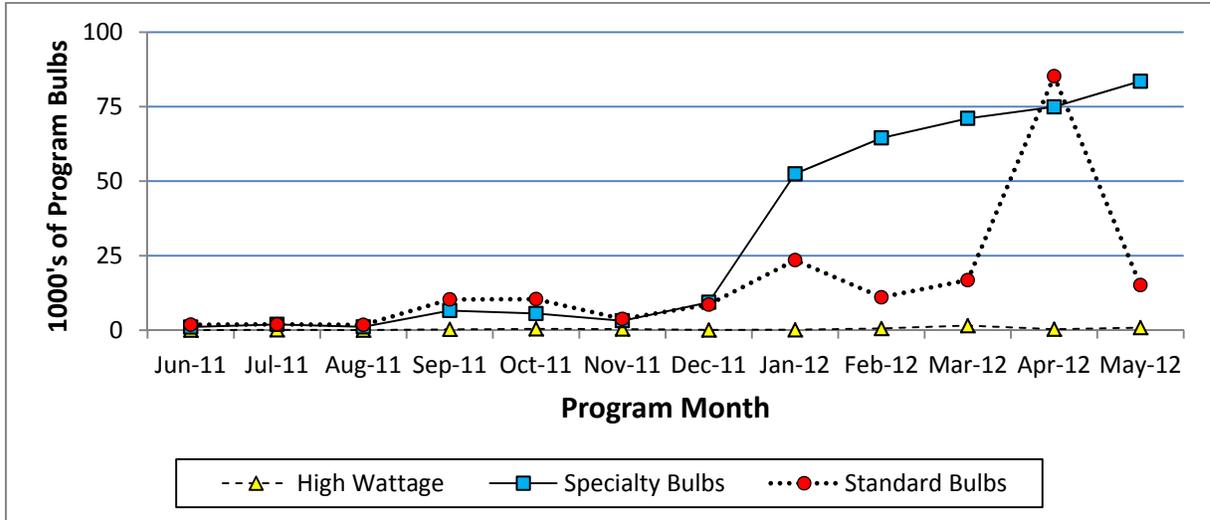
Source: Midstream Incentive Tracking Data

5.2.2.2   Installation Rate

The evaluation estimates of installation rate for CFLs purchased as part of the PY4 Midstream Incentives Lighting program were calculated based on data gathered during the end user telephone surveys. Fifty-one surveys were completed across 11 business type classifications. The questions asked of respondents during the phone surveys included:

- What percentage of the CFLs purchased since June 2011 have been installed in your business?
- Where are the discounted CFLs that were not installed?
- How many bulbs would you estimate are in storage?
- What percentage of the installed bulbs would you estimate have been removed?
- Why did you remove the CFLs?

Based on the responses to these questions the installation rate was calculated as the number of bulbs installed divided by the total number of bulbs sold. If bulbs were removed due to product dissatisfaction (not bright enough, took too long to warm up, etc.), those bulbs were subtracted from the number of bulbs installed. If bulbs were removed because they broke, stopped working, or burned out, those bulbs were still included in installation rate (these effects are accounted for in the EUL estimate). Three of the 51 surveys were excluded from the sample due to conflicting answers related to the first and third questions listed above or a response of "Don't know" to the first question. Table 5-7 below shows the installation rates based on the end user survey.

Table 5-7. End User Survey Installation Rate

Population		Installation Rate	n Respondents	n Bulbs	Lower 90% CI	Upper 90% CI
Overall Weighted[43]		73%	48	9,398	62%	83%
Bulb Type	Standard	87%	15	2,514	73%	100%
	Specialty	66%	40	6,849	54%	79%
	High Wattage	70%	5	35	36%	100%
# of Bulbs Purchased	< 50	86%	17	408	72%	100%
	≥ 50	71%	31	8,990	58%	85%

Source: PY4 End User Surveys

The survey results indicate an overall installation rate of 73%. When disaggregated by bulb type, standard bulbs have the highest installation rate of 87%, followed by high wattage bulbs (70%), and specialty bulbs (66%). Due to the small sample of survey respondents these differences are not statistically significant. When aggregated by the number of bulbs purchased, respondents purchasing fewer than 50 bulbs reported an average installation rate of 86%, whereas those purchasing 50 or more bulbs installed 71% on average.

Due to their higher prices and more specific applications, specialty and high wattage bulbs often have higher installation rates than standard bulbs in residential programs. In commercial and industrial applications, however, businesses such as offices and hotels may purchase large numbers of specialty bulbs to have on hand in the event that bulbs burn out or break. To examine this possibility, the installation rate of specialty bulbs was calculated based on the number of specialty bulbs purchased. Table 5-8 shows the results of this analysis. Respondents purchasing less than 50 bulbs installed 83% whereas those purchasing 50 bulbs or more only installed 66%. The higher installation rate for smaller purchases follows the same logic as residential applications (e.g., smaller purchases are for a specific application and are installed immediately). The lower installation rate of 66% for purchases of 50 bulbs or more supports the idea that businesses purchasing large quantities of bulbs are doing so in order to have some bulbs on hand for future use. Again, due to the small sample of survey respondents these differences are not statistically significant.

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[43] The weights applied to estimate the overall installation rate were created in an effort to make the sample of respondent's surveys representative of the population of program bulbs sold.

Table 5-8. Specialty Bulb Installation Rate by Quantity of Bulbs Purchased

Population		Installation Rate	n Respondents	n Bulbs
# of Specialty Bulbs Purchased	< 50	83%	14	268
	≥ 50	66%	26	6,581

Source: PY4 End User Surveys

Installation rate was not examined as a function of retailer type because six of the 11 business types surveyed have three respondents or fewer. A larger sample of end user surveys in subsequent years would allow for a more robust and multifaceted analysis of installation rate.

5.2.2.3 Delta Watts

As stated in the methods section above, since delta watts were not deemed for this first full program year of the MSI program, Research Findings Savings were estimated using the bulb type and lumen based method developed for the Impact Evaluation Research Report. Delta watts estimates based on the program tracking data are also provided in this report.

The PY4 Impact Evaluation Research Report estimate of delta watts estimate was calculated using a lumen-based mapping that also takes into account the bulb shape and type (omni-directional, globes, directional, decorative). The bulb type lumen mapping for PY4 Evaluation Research Findings is taken from the new Energy Star draft specification for lamps[44] and results in an average delta watts estimate of 58.2, which is 39% higher than the estimate of DW from the Goals Tracker. Going forward the evaluation team recommends using the lumen-based mapping that relies on bulb shape since it provides a more robust means of establishing incandescent equivalent wattage across all bulb types, especially specialty CFLs and LEDs. Because lumen output is a measure of the total light produced in all directions from a source, bulbs such as reflectors (and LEDs in general) that focus light in a single direction require a different lumen mapping than a standard CFL.

One significant hurdle the evaluation team ran into in implementing the bulb-type and lumen mapping was the lack of lumen output and specific bulb-type data in the MSI tracking databases. Additionally, the PY4 MSI program had more than 350 unique model numbers making manual lumen and bulb-type lookups not a viable option. As a result, estimated lumen output mappings were assigned based on manual lookups of PY4 MSI program bulbs and/or mappings to the extensive PY4 Residential ES Lighting Program database. Bulb-type was determined based on a parsing of the bulb description variable included in the tracking data.

The top nine selling bulbs in the PY4 MSI program made up two-thirds of program sales. These bulbs were all manually researched to determine the appropriate lumen output and hence the appropriate base wattage based on the ES bulb-type and lumen mapping. In PY4, the Residential ES Lighting Program sold more than 12.5 million bulbs and the lumen output for those bulbs was captured by the

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[44]http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Specification.pdf?4749-8e30

program implementer and provided to the evaluation team. The evaluation team used this large CFL database to identify bulb-type and CFL wattage combinations there were consistently assigned to a single lumen-based base wattage. This covered the majority of MSI program bulbs not in the top nine selling models. All MSI program bulbs that fell into a bulb-type and CFL wattage combination that was mapped to multiple base wattages values were manually researched online. The evaluation team believes this combination of efforts has produced a robust lumen and bulb-type based base wattage mapping.

In order to estimate the watts displaced by installing a program bulb, it is necessary to know the wattage of the program bulb and the approximate wattage of the bulb that it is replacing (the base watts). For each program bulb, delta watts was calculated as the difference between the program CFL wattage and the estimated base wattage for that particular bulb. As part of the PY4 Midstream Incentives Lighting Program evaluation, average delta watts values were estimated by bulb type (standard, specialty and high wattage) and overall using data from the Goals Tracker and an ES bulb-type lumen mapping.

Table 5-9 below shows the average delta watts value across by program bulb type based on the Goals Tracker base wattage mapping and the ES bulb-type lumen mapping. Across all bulb types, the variation in delta watts resulting is around 20%. As this table shows, the Goals Tracker seemed to underestimate the DW for standard and specialty CFLs by about 20% and overestimate the DW for high wattage bulbs by about 4%.

Table 5-9. Average Delta Watts Estimates by Bulb Type

Delta Watts Estimates	Standard[45]	Specialty	High Wattage	PY4 Bulbs
Bulbs Sold	194,180	376,322	4,750	575,252
Avg Delta Watts – Goals Tracker Data	42.7	40.5	121.1	41.9
Avg Delta Watts – ES Lumen Based	50.9	49.6	115.9	50.6

Source: Evaluation Team analysis of ComEd Tracking database

A review of the differences between the Goals Tracker base wattages and the ES lumen based base wattages was performed and showed that for standard bulbs the primary differences were the mappings for 13, 14 and 23-Watt standard CFLs, which the Goals Tracker mapped to base wattages of 49, 53 and 87, respectively, but the ES Lumen based mapping resulted in a base wattage of 60 for the 13 and 14-Watt bulbs and 100 for the 23-Watt bulb. These three CFL wattage levels made up 59% of the standard CFL bulb sales in PY4 and the average DW increase across these bulbs was 11.4 watts. Similarly for specialty bulbs, the Goals Tracker mapping was low for A-lamps (-5 watts), BR30 and PAR38 reflectors (-21 watts) and Globes (-36 watts), but high for R20, R30 and R40 reflectors (+15 watts).

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[45] Coupon bulbs included in this table with standard bulbs.

5.2.2.4   Hours of Use and Peak Coincidence Factor

The PY4 Research Findings HOU and Peak CF estimates are based on the PY4 Prescriptive Workpapers and the PY5 TRM for Residential Lighting. The average overall HOU estimate from this study was 11.6 hours per day and the average overall Peak CF estimate from this study was 0.61.

Estimates of HOU and Peak CF tend to vary widely across various commercial locations and thus the evaluation team believes the most accurate HOU and Peak CF estimates are calculated by assigning these estimates based on the type of commercial locations where the program bulbs are installed. As described above, end user business types were determined based on customer name and refined based on data collected during the end user telephone surveys.

Table 5-10 below shows the distribution of PY4 MSI commercial and residential building and the estimated daily HOU and Peak CF of these locations based on the PY4 KEMA prescriptive workpapers and the PY5 IL TRM (for Residential Lighting). This table also presents the overall bulb weighted average daily HOU and Peak CF, as well as the estimates across all residential and commercial locations. It is interesting to note that while residential locations tend to have lower daily HOU and Peak CF than commercial locations, in this case the residential averages are higher than the commercial averages since the majority of program bulbs installed in residential locations are believed to have been installed in apartment common areas (based on findings from the end user surveys) which have extremely high HOU and Peak CF estimates associated with them.

Table 5-10. End User Business Type Distribution and Associated HOU and Peak CFs

Business Type	PY4 Bulb Sales	Daily HOU	Peak CF
Office	45,833	10.7	0.65
School (K-12)	14,440	7.7	0.67
College/University	5,554	9.7	0.67
Retail/Service	63,954	10.6	0.68
Restaurant	33,194	13.3	0.81
Hotel/Motel	49,673	4.1	0.18
Medical	23,219	15.4	0.64
Grocery	8,504	13.4	0.50
Industry	57,153	14.3	0.78
Miscellaneous NonRes	151,078	12.2	0.63
Apt/Condos - in-unit	31,889	2.57	0.10
Apt/Condos - common space	90,761	16.3	0.75
Average	**575,252**	11.6	**0.61**
Residential Average	**122,650**	**12.7**	**0.58**
Commercial Average	**452,602**	**11.3**	**0.62**

Source: In-store Intercept Surveys, KEMA Operations Manual and PY5 IL TRM (Res Lighting)

5.2.2.5 Interactive Effects

Similar to the HOU and Peak CF reported above, energy and demand interactive effects vary significantly by end user business type and thus the evaluation team believes are best assigned based on the distribution of the participating end-users. The ComEd PY4 Prescriptive Workpapers include estimates of both energy and demand interactive effects by business type. The commercial building type-specific interactive effects estimates from the Workpapers were applied to the distribution of specific commercial building types into which program bulbs were being installed. For bulbs installed within the individual units of apartment buildings/condominiums,, the energy and demand interactive effects factors developed in the PY4 Residential ES Lighting program evaluation for interior bulb placements in multi-family units were applied. The factors developed in that report consist of default factors in the Residential Lighting PY5 TRM, adjusted to account for heating penalties in electrically heated homes based on data available through the U.S. EIA Residential Energy Consumption Survey (2009). See the PY4 Residential ES Lighting program evaluation report for additional information on methods and data sources.

Table 5-11 below shows the distribution of PY4 MSI commercial and residential building and the estimated energy and demand interactive effects (Waste Heat Factor Energy (WHFe) and Waste Heat Factor Demand (WHFd)). The interactive effect estimates for the commercial bulb installations are based on the PY4 KEMA prescriptive workpapers. The residential interactive effect estimates were developed using the Illinois TRM and data from the U.S. DOE EIA Residential Energy Consumption Survey (RECS) 2009. While the WHFe in the IL TRM for multi-family locations is estimated to be 1.04, this estimate only considers the cooling savings and ignores the heating penalties. Based on the RECS data these heating penalties are substantial for multi-family residences in IL due to the high percentage of these residences that have electric resistance heat.

Table 5-11. End-User Business Type Distribution and Associated Interactive Effects

Business Type	PY4 Bulb Sales	WHFe	WHFd
Office	45,833	1.20	1.27
School (K-12)	14,440	1.13	1.38
College/University	5,554	1.29	1.52
Retail/Service	63,954	1.22	1.47
Restaurant	33,194	1.31	1.61
Hotel/Motel	49,673	1.02	1.45
Medical	23,219	1.34	1.63
Grocery	8,504	1.17	1.39
Industry	57,153	1.01	1.03
Miscellaneous NonRes	151,078	1.20	1.41
Apt/Condos - in-unit	31,889	0.98	1.07
Apt/Condos - common space	90,761	0.98	1.07
Average	**575,252**	**1.13**	**1.32**
Residential Average	**122,650**	**0.98**	**1.07**
NonResidential Average	**452,602**	**1.17**	**1.39**

Source: In-store Intercept Surveys, KEMA Operations Manual and PY5 IL TRM (Res Lighting)

5.2.2.6 Leakage

Based on the end-user phone interviews conducted for the PY4 evaluation, leakage is most likely an insignificant problem for the MSI program. Of the 51 respondents, only one (approximately two percent of respondents) said that some bulbs would be installed outside of the ComEd service territory. The number of bulbs reported to have been installed outside of ComEd's territory was less than 0.2% of the total bulbs purchased by survey respondents. While these results suggest a very low leakage rate, a larger sample size would be desirable.

5.2.2.7 Carryover Savings

The end-user telephone interviews also allowed for a preliminary investigation into respondent expectations regarding bulbs purchased in PY4 but not yet installed. The residential program evaluation operates under the assumption that bulbs purchased but not installed in a given program year will be installed evenly in the next two program years. This section examines whether this assumption is appropriate for the MSI program as well.

Of the 51 respondents, 18 indicated that 100% of bulbs were installed in their business, two indicated that the remaining bulbs were installed at another location, and one didn't know how many had been installed. The remaining 30 respondents indicated that they installed between one and 99% of their program bulbs, with the remainder in storage. When asked the question, "How many of the bulbs in storage do you expect to install in the next year?" These 21 respondents provided an answer of "All," "Half," or "Some." Table 5-12 shows the survey results of this question. When all 21 respondents were grouped together, 52% expected to install *all* remaining bulbs in the next year. Similar results arose when respondents were disaggregated by the number of bulbs purchased. Fifty-seven percent of end users who purchased less than 50 bulbs and 50% of end users purchasing 50 or more bulbs indicated that *all* bulbs would be installed in the next year. Results were further disaggregated by the percentage of bulbs initially installed. Disaggregating the results to this degree creates very small sample sizes within each bin. However, there is one potential trend worth examining in future evaluations. The majority of respondents who installed 50% or more bulbs in PY4 expected to install *all* remaining bulbs in the next year, while 50% or less of those who installed fewer than 50% of their bulbs in PY4 expected to install all remaining bulbs in the next year. While the small sample size makes it difficult to make definitive claims, it appears that there may be a good argument for frontloading carryover savings rather than splitting them equally over the two subsequent program years. If similar results are seen in subsequent program years with larger sample sizes, the default assumption the 50% are installed in each year should be modified accordingly.

Table 5-12. End-User Self-Report Carryover Bulbs Installation Rate

	All		Half		Some	
	% respondents	n	% respondents	n	% respondents	n
All w/ Bulbs in Storage	52%	11	19%	4	29%	6
< 50 Purchased	57%	4	14%	1	29%	2
> 50 Purchased	50%	7	21%	3	29%	4
90-99% Installed	67%	2	0%	0	33%	1
80-89% Installed	67%	2	0%	0	33%	1
50-79% Installed	71%	5	14%	1	14%	1
20-49% Installed	33%	1	0%	0	67%	2
10-19% Installed	50%	1	50%	1	0%	0
1-9% Installed	0%	0	67%	2	33%	1

Source: PY4 End User Surveys

5.2.3   Research Findings Gross Savings Results

Based on the gross impact parameter estimates described above, the Research Findings gross program impacts resulting from PY4 Midstream Incentive Lighting program were developed. The results are provided in Table 5-13 below.

Table 5-13. Research Findings Gross Parameter and Savings Estimates

Research Findings Gross Parameter and Savings Estimates	Standard	Specialty	High Wattage	All PY4
CFLs Distributed through the Program	194,180	376,322	4,750	575,252
Average Displaced Watts (Delta Watts)	50.9	49.6	115.9	50.6
Average Daily Hours of Use		11.6		11.6
Gross kWh Impact per unit	216.1	210.3	491.4	214.5
Gross kW Impact per unit	0.05	0.05	0.12	0.05
Peak-Load Coincidence Factor		0.61		0.61
Installation Rate		0.73		0.73
Leakage		0.02%		0.02%
Total 1st-Year Research Findings Gross MWh Savings	**34,060**	**64,238**	**1,895**	**100,193**
Total 1st-Year Research Findings Gross MW Savings	**7.2**	**13.5**	**0.4**	**21.1**
Total 1st-Year Research Findings Gross Peak MW Savings	**5.8**	**10.9**	**0.3**	**17.0**

Source: Evaluation Team Analysis

5.2.4 Research Findings Net Savings Parameters

As mentioned above, after gross program impacts have been estimated, net program impacts are calculated by multiplying the gross impact estimate by the program realization rate and net-to-gross ratio (NTGR).

5.2.4.1 Net-to-Gross Ratio

In PY4, two primary methods were used to estimate the NTGR:

1. Customer self-report approach based on the end user telephone surveys
2. Supplier self-reports based on in-depth interviews with program lighting distributors

Customer Self-Report Method

As shown in Table 5-14, the overall end-user customer self-reported NTGR across all PY4 CFLs was estimated to be 0.63. The table below also provides NTGR estimates by bulb type and the number of bulbs purchased. As the table shows, end users purchasing 50 or more bulbs had higher estimated NTGR than those purchasing fewer than 50 bulbs (although the results shown are not statistically significantly different due to the small sample sizes). Customers that purchased fewer than 50 bulbs were found to have higher spillover rates (i.e. were more likely, as a percentage of their program bulb sale, to buy non-discounted energy efficient bulbs due to their experience with the MSI program).

Table 5-14. End-User Customer Self-Reported NTGR

Population		NTGR w/o spillover	NTGR w/ spillover	n	n Bulbs	Lower 90% CI	Upper 90% CI
Overall		0.61	0.63	51	15,388	0.59	0.66
Bulb Type[46]	Standard	0.54	0.55	16	2,584	0.43	0.67
	Specialty	0.64	0.66	42	12,769	0.63	0.68
	High Wattage	0.54	0.54	5	35	0.30	0.78
# of Bulbs Purchased	< 50	0.41	0.48	17	408	0.32	0.63
	≥ 50	0.63	0.63	31	14,980	0.61	0.68

Source: Evaluation Team Analysis of End User Survey Data

The overall NTGR is calculated as the average of three component scores. The first of these component scores reflects the respondents' rating of the overall importance of the Midstream Incentive Program in their decision to purchase the screw-in CFLs from the distributor on a zero to 10 scale. The second component is derived from the self-reported likelihood that they would have purchased the same bulbs

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[46] Results shown by bulb type and number of bulbs purchased are not statistically significantly different. They are shown as directional indicators only and future evaluation of NTGR by these segments is recommended.

in the absence of the program, also on a zero to 10 scale. The third component is based on a ratio of how the respondent rated the importance of several specific program factors to how they rated the importance of several specific non program factors. Naturally, in calculating this third component score, higher scores for the importance of program factors drive the NTGR up, and higher scores for the importance of the non-program factors drive the NTGR down.

Respondents rated the overall importance of the program at a fairly high level, with a bulb sales weighted average score of 7.5. For the second scoring component, respondents indicated a fairly low likelihood that they would have bought the same bulbs in the absence of the program, with a weighted average score of 3.6 (In the overall NTGR calculation, this score is converted to its converse [10 – 3.6 = 6.4] to express the answer in terms likelihood that the respondent would *not* have purchased the same bulbs in the absence of the program). For the third component, respondents generally gave equal ratings to the importance of specific program and non-program scores, which resulted in a weighted average score of 5.0 for this component. Among specific program factors within this third component, the highest average importance score was given to the availability of the incentive at 8.7, followed by a recommendation from a distributor salesperson at 7.9, then information from the Midstream Incentive Program or ComEd marketing materials at 6.6, and previous experience with ComEd's Midstream Incentive Program or similar utility program at 5.3. Among specific non-program factors, the highest average importance score was given to the statement that screw-in CFLs are already standard practice in their industry at 8.5, followed by the statement that corporate policy or guidelines require purchasing high efficiency lighting such as CFLs at 8.2, then the importance of the respondents' previous experience with CFLs at 7.4.

An average of the three component scores yields an overall NTGR of 0.63. Ultimately, the three component scores fell into a fairly narrow range of 0.50-0.75 and provided a consistent message about the influence of the program on participants' purchasing behavior.

Supplier Self-Report Method
The overall net-to-gross estimate from the MSI distributor interviews was estimated to be 0.56 which generally corroborates the lower than expected estimate derived from the end user surveys. It is worth noting, however, that the overall distributor NTG estimate is based largely on the response of one specific distributor who emphasized that almost all of their sales volume of medium screw based specialty CFLs was due to the program (NTGR = 0.95 and they sold more than 50% of the program specialty bulbs). Net-to-gross estimates calculated from all other distributor interview respondents ranged from zero to 0.31. When excluding the single distributor with the very high estimated NTG, the average NTG ratio from remaining distributors' estimates of changes in sales due to the program is 0.18.

Several consistent themes about the role of the program emerge from reviewing distributors' responses to interview questions. In terms of estimates of sales lift due to the existence of the program, most respondents provided answers that they said applied across standard CFLs, specialty CFLs and high wattage CFLs, and these estimates ranged from 0% to 50% (0%, 7%-10%, 15%-20%, 21%, 25%, 25%, 35%, 40%-50%). Two respondents gave answers differentiated by bulb type, and these responses also indicated similar ranges of sales lift for standard CFLs, from five percent to 10%, and for high wattage CFLs, from one percent to 20%. The high sales lift estimate mentioned earlier was specifically for specialty CFLs.

All eleven interviewees indicated they would have been selling medium screw-based CFL products between June 1, 2011 and May 31, 2012 whether or not the discounts from the program had been available. Distributors generally indicated that they had already been selling these types of lighting products for a number of years prior to the program and that sales had been steadily increasing. As such, they said it was somewhat difficult for them to disaggregate the impacts of the program from their general sales trends. While respondents emphasized that they would have been selling qualifying products anyway without the program, five respondents made a point of saying the products would be a harder sell in the program's absence. According to one respondent, "To incentivize a more efficient product has an effect on [a contractor] because now he's able to offer a value to the person he is doing the work for without taking a big hit in his pocket." Several distributors made qualitative comments that they have seen no real change in CFL sales since the program began, though these same distributors later offered quantitative estimates of sales lift that were greater than zero.

The most consistent positive impact of the program cited by distributors was that it motivated new purchasers of CFLs who may not have purchased them in the program's absence. Seven respondents out of eleven indicated that the program attracted new customers. According to one respondent, "There were definitely some new customers, like people who had never bought anything from us before, but more importantly, among our existing customers, people who have purchased things from us before, they were buying products that they hadn't purchased before." According to another, "The incentive offers them a bridge to—or a reason to step up to a little bit more expensive product and then also try new technology." In contrast, three respondents indicated that the program did not attract new customers, and one said they couldn't make a clear determination on that.

Interviewees did not emphasize that customers would likely have bought incandescent bulbs if they had not purchased program CFLs. When asked what percentage of their program bulb sales would likely have been incandescent bulb sales in the absence of the program, one respondent said, "CFLs and other more efficient lighting are an increasing percent of our sales, regardless." Another said, "I don't know the percent, but we are moving away from incandescent and are selling much fewer of them."

The End User survey responses offer information in a similar vein. Out of 50 survey respondents who gave answers regarding the importance of the program in their decision to purchase CFLs from the distributor, 33 rated the importance of the program at a seven or more. Yet among these 33 respondents, 11 also said there was a likelihood of seven or more that they would have purchased the same bulbs in the absence of the program. When asked to clarify this apparent contradiction, five respondents indicated that while the incentive was appreciated, they still would have bought the CFLs in the absence of the program. According to one respondent, "they give us a good price on the CFLs, and that's very important for the company. But if they didn't have the incentive, we still needed them anyway so we would've had to purchase them." According to another, "the incentive was important, but we would still have purchased the CFLs even without the incentive." The other six respondents in this group of 11 indicated that without the incentive they would have purchased fewer bulbs or would have purchased them at a later time.

Another factor that sheds light on the net impacts of the program is the degree to which end users had been purchasing CFLs or incandescent bulbs prior to the program. One indication of this from the end

user survey is the percentage of CFLs that respondents said were already installed in screw-in lighting sockets in their business before they purchased program bulbs. Approximately 47% of customers surveyed reported that prior to purchasing the program bulbs, they already had CFLs installed in 50% or more of their screw-in sockets. The most common response was CFLs in "More than 75% of the sockets, but not all of the sockets", as reported by 14 out of 51 respondents and as shown in Figure 5-2 below.

Figure 5-2. Sockets with CFLs Prior to Program
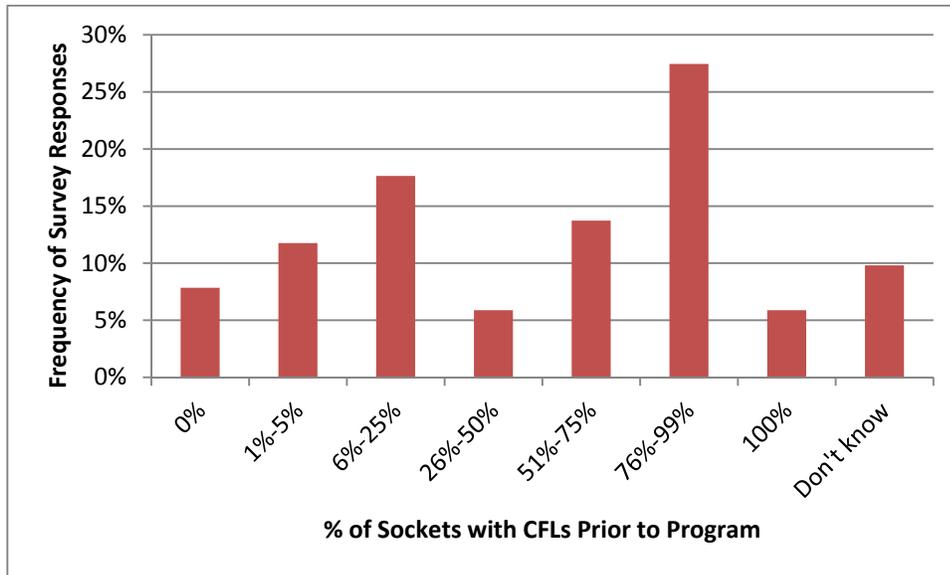
Source: Evaluation Team Analysis of End User Survey Data

Comparison of Net Impact Results across Methods

Table 5-15 presents estimated NTGR resulting from the two NTGR methods employed during the PY4 evaluation. The Supplier Self-Report NTGR is regarded as a directional indicator to give context to the Customer Self-Report NTGR. However, due to the more robust customer SR algorithm that considers numerous aspects of free ridership and the generalized estimates provided by the distributors the evaluation team recommends using the customer SR NTGR of 0.63 to calculate the PY4 Research Findings. If the program distributors would be willing to confidentially provide the evaluation team with their pre-program screw-in CFL sales, an additional estimate of NTGR could be estimated and compared to these two methods.

Table 5-15. NTGR Estimates by Evaluation Method

Evaluation Method	Data Source	NTGR Estimate	Lower 90% CI	Upper 90% CI
Customer Self-Report	End User Telephone Surveys	0.63	0.59	0.66
Supplier Self-Report	Distributor In-depth Interviews	0.56	n/a	n/a
Recommended PY4 NTGR Estimate		**0.63**	**0.59**	**0.66**

Source: Evaluation analysis

5.2.5 Research Findings Estimated Net Savings

The final net program impacts were derived by multiplying the Research Findings gross program savings estimates by the NTGR. The Research Findings program-level first-year net energy saving estimate resulting from this evaluation is 63,358 MWh, the net demand savings estimate is 13.2 MW, and the peak demand savings estimate is 10.7 MW. The net attainment rate on program reported net energy savings is 138% (63,358 /45,689).

5.3 Recommendations for TRM Updates

The evaluation team recommends the following update to the IL TRM:

- **Delta Watts:** The evaluation team recommends switching to a bulb type lumen mapping (such as the one presented within the Research Findings section in Appendix 5 that is based on the new Energy Star draft specification for lamps[47]). Using a lumen-based method that also relies on bulb shape provides a more robust means of establishing base wattage equivalents across all bulb types, especially specialty CFLs and LEDs. Because lumen output is a measure of the total light produced in all directions from a source, bulbs such as reflectors (and LEDs in general) that focus light in a single direction require a different lumen mapping than a standard CFL. The TRM that goes into effect in PY5 assigns base-wattages using lumen bins that are not differentiated by bulb type and thus this issue continues under the PY5 TRM.

The mapping used in PY4 to estimate the Research Findings delta watts are include in Table 5-16 below.

Table 5-16. Lumen and Incandescent Equivalency Mapping

Bulb Type	Lower Lumen Range	Upper Lumen Range	Energy Star Base Wattage
A-lamp, Post, Twist, Dimmable Twist, 3-Way, and CFL Fixtures	250	449	25
	450	799	40
	800	1099	60
	1100	1599	75
	1600	1999	100
	2000	2549	125
	2550	3399	150
	3400	5279	200
	5280	6209	300
Globe	90	179	10
	180	249	15
	250	349	25
	350	499	40
	500	574	60
	575	649	75
	650	1099	100

[47]http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/lamps/V1.0_Draft_2_Specification.pdf?4749-8e30

Bulb Type	Lower Lumen Range	Upper Lumen Range	Energy Star Base Wattage
	1100	1300	150
Candelabra	70	89	10
	90	149	15
	150	299	25
	300	499	40
	500	699	60
	800	900	100
R20	300	399	30
	400	629	40
	630	719	45
	720	1009	50
	1010	1209	65
	1210	1519	75
	1520	1739	90
	1740	2189	100
	2190	2909	120
R30 and R40	400	749	40
	750	849	45
	850	1189	50
	1190	1419	65
	1420	1789	75
	1790	2049	90
	2050	2579	100
	2580	3429	120
BR30, BR40, PAR16, PAR20, PAR30, PAR38, and LED Fixtures	200	299	20
	300	399	30
	400	499	40
	500	599	50
	600	649	60
	650	749	65
	750	899	75

Bulb Type	Lower Lumen Range	Upper Lumen Range	Energy Star Base Wattage
	900	999	90
	1000	1199	100
	1200	1499	120

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5.4 Data Collection Instruments

Below are the three data collection instruments used within this evaluation.

5.4.1 In-depth Interview Guide

ComEd PY2 MidStream Incentive Interview Guide –APT
June 14, 2012

1. What is your role in the program? What are your main responsibilities? Have these changed over time? How long have you carried these out?

2. Can you please give me an idea of the timeline for the implementation of PY4? Was it a seamless transition from the pilot to PY4? Are there any other PY4 implementation issues that we should be aware of?

3. How were distributors selected for program participation? How is the program marketed to distributors? How has distributor participation changed from the pilot to PY4? How is it changing for PY5? Have the distributors impression of the program and desire to participate in it changed over time?

4. Can you describe the types of distributors that are participating in the program (business model, customers, pre-program sales of MSB CFLs, cold calls vs. standing orders, etc). Sales by distributor vary significantly from a handful of program transactions to thousands. What do you think is causing this difference? We've heard that one distributor, Midwest Industrial, hired reps to specifically sell this program, is that correct?

5. The evaluation of the pilot program reported that it was difficult to recruit distributors to participate in the MSI program due to:
   a. Difficult meeting program sales tracking requirements,
   b. Fear of negative effects on sales margin due to selling discounted bulbs,
   c. Paperwork associated with the program,
   Do you agree that these were issues in the PY3 pilot? If so, do you believe any of these issues have improved in PY4?

6. How were MSI eligible products determined? Did APT or ComEd determine work with distributors to determine specific program eligible SKUs or are all SKUs that meet certain requirements (such as wattage, Energy Star, etc.) eligible? Were any "shelf-survey's" done to get an inventory of what products each of the distributors were selling prior to the promotion and the prices on these products? It seems as if many distributors only sell CFLs in single packs. Do you know what this is?

7. How frequently do program distributors sell bulbs through standing contracts? If customers had a standing order with a program distributors for CFL prior to participation in the program were those bulbs still discounted? Do you know how frequently this occurred?

8. How were program incentive levels originally determined? Why were they increased midway through the program year? What was the impact of this increase in incentive? I noticed in the PY5 program documentation they are decreasing for PY5. How do you estimate this will impact the program?

9. The table below shows the number of bulbs allocated, by bulb type, for PY4 as well as the number of bulbs sold, by bulb type (as of 5/20). Why do you believe the sales of standard CFLs are lagging and the sales of specialty CFLs are exceed goals? What is the impact of this on the program savings estimates?

Bulb Type	Bulbs Allocated	Bulbs Sold (as of 5/22)
Standard	535,570	146,093
Specialty	233,504	317,522
High Wattage	24,755	2,917
Total	793,829	466,532

10. Based on the preliminary PY4 data it seems as if the program will not meet its sales goals for PY4. Why do you think sales have been less than anticipated?

11. What do you perceive to be the level of satisfaction among program distributors with the current incentive levels amounts? How about with program participants (end- users)? What do you perceive to be the level of satisfaction among program distributors with respect to the sales generated by the promotional pricing?

12. Can you describe the relationship between ComEd and APT with respect to the program? What is each party responsible for? What responsibilities are shared?

13. Are there regular interactions between ComEd and APT where issues are raised and addressed, status reports are delivered, issues resolved?

14. Now let's talk about field representatives. Do field representatives play a role in this program? If yes, what is that role?

15. Does EFI handle all of the program bulb sales verification and distributor payment? What other roles do they fulfill in the program?

16. Do you know if any non-participating distributors have lowered their prices on CFLs to stay competitive with the program bulbs?

17. Do you know if any of the program distributors sell lighting products to residential customers (or to customers who will install CFLs in residential locations)? Do any sell bulbs to customers outside of ComEd service territory?

18. Is there anything else relevant to the program or program's progress that we have not discussed that we should know about?

19. Are there any key MSI process-related issues you would like to see explored in this year's evaluation?

20. In your opinion, how effective has the overall MidStream Incentive Program been thus far? What elements of the program are working best? What elements need improvement?

21. We've heard that in PY5 the program will be expanded to include Linear Fluorescents, Metal Halide bulbs and LEDs. Will there be any other changes to the PY5 program? Please detail any anticipated changes.

22. We are currently getting ready begin our Distributor Interviews – Could you please review our listing of PY4 active distributors to make sure we have the appropriate contact and phone number. We are looking for the distributor contact that is the most knowledgeable about their organizations participation in ComEd's MidStream Incentive program.

23. We do not have a contact for Lowe's. Is this something you could provide? Based on our tracking data they seem to have some sales in PY4. Do you know how many storefronts they had participating in the program? How did the Lowe's and Home Depot program operate?

24. We are relying on the distributors to provide us with contact information for the end-user survey. Do you anticipate them having any difficulty providing us with a contact name and telephone number for the customers they do business with?

Thank you very much for taking the time in assisting us with this evaluation. Your contribution is a very important part of the process.

5.4.2   Distributor Interview Guide

PY4 ComEd CFL Midstream Incentive Program
Interviews with Distributors

Definitions

Spiral CFL Bulbs - CFL bulbs that DO NOT have special functions such as reflectors/floods, dimmability or 3-way light levels.

Specialty CFL Bulbs - CFL bulbs that HAVE special functions such as reflectors/floods, dimmability or 3-way light levels.

High Wattage CFL Bulbs - Energy Star-qualified CFL bulbs with wattage of 35 or higher.

Introduction

Hello. This is _____calling from Opinion Dynamics Corporation/Itron on behalf of ComEd as part of the evaluation of its Commercial and Industrial Midstream Incentives Lighting Program.

The purpose of the interview is to learn about your company's participation in ComEd's Midstream Incentive Program and to understand how this program has impacted your sales of CFLs. Are you the person most knowledge about your organizations participation in the Midstream Incentives Program? The interview will take about 1 hour and information that is provided will remain strictly confidential.

The following are the appropriate representatives for this evaluation – John Delany of ComEd (630) 437-3040, Debra Ponder of APT (630) 689-8502.

Distributor Participation

1. What is your role with respect to ComEd's Midstream Incentives Program?

2. When did you first get involved with the ComEd Midstream Incentive Program? Did you participate in the pilot (Jan 2011 – May 2011)? How did you first hear about this program offering? Were you approached by ComEd program staff?

3. What were your primary reasons for getting involved with ComEd's Midstream Incentives Program? What do you see as the main benefits of participating?

4. Have you encountered any challenges in participating in this program? [Probe for effect on sales margin, difficulty meeting data tracking requirements, burden of paperwork.] How were these challenges addressed?

Program Marketing & Operations

5. What types of ComEd marketing materials promoting the Midstream Incentives Program do you have available for customers? How are they displayed? What type of support does ComEd offer you to assist you with your participation in this program?

6. Are customers aware that the bulbs they are purchasing are discounted? If yes, are customers aware that ComEd is the source of the bulb discount? Do you use the discount as a marketing tool? If so, how? [Probe for information in mail or at point of purchase.]

7. Does the program offer any support to your organization to encourage environmentally safe recycling and disposal of CFL products? Do you offer CFL recycling to your customers? How aware would you say your customers are with respect to the appropriate disposal practices for CFLs?

8. I'm interested in learning a little more about your customers…
   a. Who are your main customers in terms of business type? Would you characterize these companies as primarily small, medium or large?
   b. Does your organization sell items other than lighting products? If so, what percentage of your business is lighting? What percentage of your business are medium screw-based (MSB) lamps? What type of lighting products make up the majority of your lighting sales?
   c. Who are your main customers for the ComEd Midstream Incentive Program? What are their top three business activities in which program bulbs are being sold/installed? What proportion of total program bulbs would you guess is going into these three business types?
      i. Condo/Co-Op/Apartment– if selected, do you have a sense of whether these program bulbs are being installed in common spaces or individual tenant units?
      ii. Office,
      iii. Restaurant,
      iv. Retail/Grocery/Liquor,
      v. Warehouse,
      vi. Hospital/Health care,

      vii.   School K-12/College,

     viii.   Hotel/Motel,

       ix.   Public assembly e.g. church/theater/conference,

        x.   Industrial/agriculture

      xi.   Other

  d. Who does the purchasing for your customers purchasing ComEd discounted bulbs (managers, owners, facilities personnel, contractors)? What type of relationship do you have with them (long-term, single encounter)?

  e. How are most orders placed (in-store counter sales, via phone or internet)? Are they standing orders/contracts, customer sales reps (cold calls or standing relationships), counter sales? [For contract orders] How frequently are orders placed? Are sales shipped to customers or do they walk out of the stores with the bulbs in hand? Does your store offer counter sales to customers?

Program Impact Parameters

9. According to the data we received from ComEd, your organization sold **X** standard, **Y** specialty and **Z** high wattage program discounted CFLs during this most recent program year (which ended May 31st). Does this sound correct to you?

10. What percent of your total lighting sales are the CFLs that you sell through the ComEd Midstream Incentive program?

11. During this past program year (June 1, 2011 – May 31, 2012) did you sell any screw-in CFL bulbs in ComEd's service territory that did not receive discounts from the Midstream Incentives Program? Are the bulb types and packages different from those you sell through the ComEd Program?

12. Prior to participating in this program what proportion of your organizations sales were medium screw-based lamps (including incandescents, CFLs and LEDs)? Has the program changed this?

13. **[IF PY4 program sales]** Did the discounts attract new customers to purchase CFLs or change any of the orders that your customers typically make? [Probe for customers purchasing CFLs instead of incandescents.]

  a. Do you think your organization would have been selling any STANDARD/SPECIALTY/HIGH WATTAGE medium screw-based CFL products between June 1, 2011 and May 31, 2012 if the discounts from the

program had not been available? Why do you say that? Were you <u>proactively</u> trying to sell them?

b.   What percentage of your ComEd incented bulb sales between June 1, 2011 and May 31, 2012 would you estimate were standing <u>purchasing contracts determined prior to MSI program participation</u> (i.e. they would have purchased the CFL bulbs without the incentive?)

c.   What percentage of your ComEd incented bulb sales between June 1, 2011 and May 31, 2012 would you estimate were <u>standing incandescent bulb conversions</u> (i.e. they would have purchased incandescent bulbs that the program/incentives not been available?)

d.   What percentage of your ComEd incented bulb sales between June 1, 2011 and May 31, 2012 would you estimate were <u>new medium screw-based bulb sales</u> (i.e. they would not have purchased any medium screw-based bulbs from your organization if the program/incentives had not been available?)

14. Does your organization sell bulbs to customers outside of ComEd service territory? Are you aware of the boundaries of ComEd service territory? What percentage of the CFL products you sold through the ComEd Midstream Incentives do you estimate were purchased by ComEd customers? Do you know of any program sales that were to ComEd customers but were likely installed outside of ComEd service territory?

15. **[If SINGLE = YES]** My records indicate that your company only sold single packs through the ComEd program. Is this correct? Are these single packs sold individual or only by the case? Why does your organization only sell single packs? Are your customers interested in purchasing multi-pack?

16. If the ComEd discounts and program promotional materials had not been available during the past year, do you think your sales of STANDARD/SPECIALTY/HIGH WATTAGE medium screw-based CFL bulbs in ComEd service territory would have been about the same, lower, or higher?

Bulb Type	STANDARD	SPECIALTY	HIGH WATTAGE
Same			
Higher			
Lower			
% higher due to program			

17. How important are the following factors in affecting your organizations sales of CFLs in ComEd's service territory between June 1, 2011 and May 31, 2011. Please use a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant.
   a. Utility incentive program? Why?
   b. Media stories promoting the use of CFLs? Why?
   c. Consumer awareness about being green/global warming? Why?
   d. Desire to reduce energy costs? Why?
   e. The new EISA 2007 standards?

18. **[If Company sold CFLs not discounted by program during PY4]** What effects, if any, did the program discounted CFLs have on your sales levels and prices of any non-program-discounted CFLs?

19. **[If Company did not sell CFLs in ComEd service territory prior to program – Q13a]** Earlier you indicated that your company **was not PROACTIVELY** selling CFL products in ComEd's service territory before getting involved with the Midstream Incentives Program. Since your organization began participating in the Midstream Incentive Program have you begun proactively trying to increase the volume of screw-in CFLs you sell? If yes, How significant was the existence of the ComEd Midstream Incentives Program and rebate in your company's decision to actively try and increase screw-in CFLs sales? Please use a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant.

EISA 2007 Legislation

20. In 2007, Congress passed a law to set higher energy standards for light bulbs. The law phases out 40 to 100 watt standard incandescent light bulbs over the next three years. How familiar are your customers with these new light bulb standards?

21. How have the bulbs you stock and sell changed as a result of these new standards? How have customers purchasing behaviors changed as a result of these new standards? How frequently have they:
   a. Stocked up on 100-watt incandescent?
   b. Purchased new energy efficient (EISA compliant) bulbs?
   c. Purchased lower than desired wattage CFLs?
   d. Purchased CFLs when they typically would have purchased Incandescent bulbs?

22. In general, how familiar would you say your customers are with the concept of lumens? What percentage of customer regularly use lumens do determine which bulbs to purchase? In general, how would you say the majority of your customers buying screw-in lamps determine what wattage bulbs to purchase? (Incandescent wattage, lumens, CFL wattage, previous experience)

Program Satisfaction

Finally I would like to find out your level of satisfaction with various elements of the ComEd Midstream Incentives Program. For these questions we will be using a scale of 0 to 10 where 0 means very dissatisfied and 10 means very satisfied. Using this 0 to 10 scale

[IF ANY RATING = 0 to 5 ASK: Why do you say that?]

   a. How satisfied were you with the <u>enrollment process</u> – that is, the process of discussing the program with the program implementer and agreeing to participate?

   b. How satisfied have you been with the <u>program tracking and verification process</u> – that is, the process used by the utility to track the sales of program discounted products?

   c. How satisfied are you with the <u>incentive processing</u> aspect of the program? [The time from sales to payment receipt]

   d. How satisfied are you with <u>the sales the program incentives have generated for your organization</u>? Have the sales met your expectations? Exceeded expectations? Caused any issues with your inventory levels? Do you feel the discount offered by ComEd is sufficient to induce your customers to buy CFLs instead of incandescent bulbs? If not, how much would the discount have to be?

   e. How satisfied are you with the <u>incentives offered for standard CFL bulbs</u>? [Incentives started at $1 and increased to $2 in December 2011]

   f. How satisfied have you been with the <u>incentives offered for specialty CFL bulbs</u>? [Incentives started at $3 and increased to $5 in December 1st 2011]

g. How satisfied have you been with the <u>incentives offered for High Wattage CFLs</u>? [Incentives have remained at $5]

h.   How satisfied have you been with the <u>program managers and other staff</u> involved in the ComEd Midstream Incentives Program?

i. How would you rate your level of satisfaction with the <u>program in general</u>?

23. Do you have any recommendations on how the program could be improved?

24. Does your organization plan to participate in PY5 (now through May 31, 2013)? How do you think the expansion of the program to linear FL, metal halide bulbs and LEDs will affect your program sales? What percentage of your organizations sales do these additional bulb types make up? How do you think the reduction in incentive levels on standard, specialty and high wattage bulbs will affect your organizations sales?

25. You should have received a spreadsheet containing PY4 program sales records. Have you had any luck appending customer contact information (contact name and telephone number) for these sales records? When do you anticipate we will receive this data?

That concludes the survey. On behalf of ComEd, thank you very much for your time, and for the information you provided.

NAVIGANT

5.4.3 MSI End User Telephone Survey Instrument

PY4 ComEd Midstream Incentive Enduser Survey

Survey Variables Needed in Sample

CONTACT_NAME - End User Contact Name

EU_ORG - End User Organization Name

PHONE – End User Phone number

DISTRIBUTOR – Distributor who sold bulbs to End User

TOTAL_BULBS – total number of bulbs sold through MSI in PY4

BULBSP20 – total number of bulbs sold through MSI + 20% for survey logic

BULBSM20 – total number of bulbs sold through MSI - 20% for survey logic

STAND_NUM – total number of Standard bulbs sold through MSI in PY4

STAND_DISC– Discount amount on Standard bulbs sold through MSI in PY4

SPEC_NUM – total number of Specialty bulbs sold through MSI in PY4

SPEC _DISC - Discount amount on Specialty bulbs sold through MSI in PY4

HWATT_NUM – total number of High Wattage bulbs sold through MSI in PY4

HWATT _DISC - Discount amount on High Wattage bulbs sold through MSI in PY4 (all $5)

BUSINESS TYPE (RESIDENTIAL) – Evaluation estimated business type

Screener Section

INTRO 1:

Hello, this is [SURVEYOR NAME] from Opinion Dynamics calling on behalf of Commonwealth Edison. We are not selling anything. We're conducting a study of businesses that purchased compact fluorescent light bulbs through ComEd's Midstream Incentive Program within the last year.

May I speak with [CONTACT_NAME] or the person at [EU_ORG/your organization] that is most knowledgeable about your companies lighting purchases? [EXPLAIN IF THERE IS MORE THAN ONE DECISION-MAKER WE ONLY NEED TO TALK TO ONE PERSON. ARRANGE CALL BACK IF RESPONDENT NOT AVAILABLE]

This call may be recorded or monitored for quality assurance purposes.

C1. Does ComEd provide electricity to your business?
1.   (Yes, ComEd)
2.   (No, Someone Else)   [SKIP TO C1a]
8.   (Don't know)   [THANK AND TERMINATE]
9.   (Refused)   [THANK AND TERMINATE]

C1a. Does your business receive a bill from ComEd for your electricity usage? [If necessary, read "Some business in this region purchase their electricity from a Retail Electric Supplier but ComEd still bills these customers"]
1. (Yes, ComEd)
2. (No, Someone Else)   [THANK AND TERMINATE]

8.   (Don't know)   [THANK AND TERMINATE]
9.   (Refused)   [THANK AND TERMINATE]

C2. What is the main business activity of your organization? [PROBE IF NECESSARY]
1. (Office)
2. (Apartments/Condos)
3. (Retail/Service)
4. (Restaurant)
5. (Hotel/Motel)
6. (Medical/Hospital)
7. (Grocery)
8. (Industrial)
9. (Warehouse)
10. (School/K-12)
11. (College/University)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

C3. According to our records, between June 1, 2011 and May 31, 2012 your organization purchased approximately [TOTAL_BULBS] screw-in CFLs from [DISTRIBUTOR]. Is this correct?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK C4 IF C3 = 2]
C4. How many screw-in CFLs would you estimate you purchased from [DISTRIBUTOR] between June 1, 2011 and May 31, 2012?
[NUMERIC OPEN END; 9998 = DK; 9999 = REF; IF QUANTITY=0, THANK AND TERMINATE]

[IF C4 <= BULBSP20 AND C4>= BULBSP20 AND C4 < 9998 THEN TOTAL_BULBS = C4, ELSE THANK AND TERMINATE]

C5. Were you aware that these screw-in CFLs you purchased from [DISTRIBUTOR] were discounted?
1. (Yes – knew were discounted)
2. (No – didn't know were not discounted)   [SKIP TO C7]
8. (Don't know)   [SKIP TO C7]
9. (Refused)   [SKIP TO C7]

[ASK IF C5=1, ELSE SKIP TO C7]
C6. Did you know this discount was provided by ComEd?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

C7. Prior to June 1, 2011 had you ever purchased screw-in CFLs from [DISTRIBUTOR]?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK C8 and C9 IF C7 = 1, ELSE SKIP TO FR1]
C8.   Had your organization ever had a standing contract order for screw-in CFLs with [DISTRIBUTOR] prior to June 1, 2011?
1.   (Yes)
2.   (No)
8.   (Don't know)
9.   (Refused)

C9.   Has the number of screw-in CFLs you purchase annually from [DISTRIBUTOR] increased, decreased or generally stayed the same since June 1, 2011?
1.   (Increased)
2.   (Decreased)
3.   (Stayed the Same)
8.   (Don't know)
9.   (Refused)

<div align="center">

Self-Report Free-Ridership

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[ASK FR1 IF C5 = 1, ELSE SKIP TO FR1a]
FR1. How did you <u>first</u> find out about the price discounts offered by [DISTRIBUTOR] on screw-in CFLs? (DO NOT READ)
1.   ([DISTRIBUTOR] employee made me aware of the discounted bulbs)
2.   (Saw marketing materials in the store)
3.   (Discount was advertised in mailing)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

FR1a. In the past year have you come across any informational materials from ComEd explaining the energy saving benefits of screw-in CFLs?
1.   (Yes)
2.   (No)
8.   (Don't know)
9.   (Refused)

[ASK FR1b IF FR1a = 1, ELSE SKIP TO N2]
FR1b. Where did you <u>first</u> see this material? (DO NOT READ) (IF "SAW MATERIALS IN STORE" PROBE FOR WHERE IN STORE)
1.   (A [DISTRIBUTOR] employee made me aware of the energy savings benefits of CFLs)
2.   (On Sales Counter)
3.   (In Store - general)
4.   (In newspaper)
5.   (Bill insert)
6.   (Mailing – non-specific)
7.   (Brochure
00. (Other, Specify) [OPEN END]
98. (Don't know)

99. (Refused)

N2. Did your company make the decision to purchase screw-in CFLs before or after you became aware of the incentives given for the purchase of screw-in CFLs through the MidStream Incentive 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 MidStream Incentive program as well as other factors that might have influenced your decision to purchase screw-in CFLs from [DISTRIBUTOR]. 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 very important, so that an importance rating of 8 shows twice as much influence as a rating of 4.

   N3a. Availability of the program incentive [ADD 96 (not applicable)]

   N3b. Recommendation from a [DISTRIBUTOR] salesperson [ADD 96 (not applicable)]

   N3c. Your previous experience with screw-in CFLs [ADD 96 (not applicable)]

   N3d. Your previous experience with ComEd's MidStream Incentive Program or a similar utility program? [ADD 96 (not applicable)]

   N3e. Information from the MidStream Incentive Program or ComEd marketing materials? [ADD 96 (not applicable)]

   N3f. Screw-in CFLs are Standard Practice in your industry? [ADD 96 (not applicable)]

   N3g. Corporate Policy or guidelines require purchasing high efficiency lighting such as CFLs? [ADD 96 (not applicable)]

FOR NR3a-NR4g [RECORD 0-10; 98 = DK; 99 = REF]

N41. Using a 0 to 10 scale, with 0 being not at all important and 10 being very important, please rate the overall importance of the MidStream Incentive Program in your decision to purchase the screw-in CFLs from [Distributor]?
[RECORD 0-10; 98 = DK; 99 = REF]

N5. Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, if the Midstream Incentive Program had NOT BEEN AVAILABLE, what is the likelihood that you would have purchased exactly the same program qualifying lighting equipment that you did from [DISTRIBUTOR]? [RECORD 0-10; 98 = DK; 99 = REF]

[ASK IF N3A=6-10 AND N5=6-10, ELSE SKIP TO FR12A]
N5a. When you answered ...<N3A> out of 10... for the question about the influence of the incentive, I would interpret that to mean that the rebate was quite important to your decision to purchase screw-in CFLs from [DISTRIBUTOR]. Then, when you answered..<N5> out of 10 for how likely you would be to purchase the same CFLs without the incentive, it sounds like the incentive was not very important in your purchase decision.
I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain in your own words, the role the incentive played in your decision to purchase screw-in CFLs from [DISTRIBUTOR]?
[OPEN END; 98 = DK; 99 = REF]

N5b. Would you like for me to change your score on the importance of the incentive that you gave a rating of <%N3A> and/or change your rating on the likelihood you would purchase the same CFLs without the incentive which you gave a rating of <%N5> and/or we can change both if you wish?

[OPEN END; 98 = DK; 99 = REF]

NTG = avg (10-N5, [if N2 = Before then N41/2, else N41], [max(N3a, N3b, N3d, N3e)/[max(N3a, N3b, N3d, N3e) + max(N3c+N3f, N3g)]])

[ASK FR12a IF STAND_NUM > 0 and N3a = 9 or 10]

FR12a. Using a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have bought the same standard twist shape CFLs if they were [STAND_DISC] more per bulb? [RECORD 0-10; 98 = DK; 99 = REF]

[ASK FR12b IF SPEC_NUM > 0 and N3a = 9 or 10]

FR12b. Using a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have bought the same specialty screw-in CFLs if they were [SPEC_DISC] more per bulb? [RECORD 0-10; 98 = DK; 99 = REF]

[ASK FR12c If HWATT_NUM > 0 and N3a = 9 or 10]

FR12c. Using a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have bought the same high-wattage CFLs if they were [HWATT_DISC] more per bulb? [RECORD 0-10; 98 = DK; 99 = REF]

YR4 Install Rate Battery

For the next set of questions I'd like you to think about the [VERIFIED TOTAL_BULBS] screw-in CFLs that you purchased from [DISTRIBUTOR] between June 2011 and May 2012.

P1. Prior to purchasing these < *VERIFIED* TOTAL_BULBS> CFLs, were you … (READ LIST)
1. Very familiar
2. Somewhat familiar
3. Not too familiar or
4. Not at all familiar with CFLs
8. (Don't know)
9. (Refused)

P2a. Prior to purchasing these < *VERIFIED* TOTAL_BULBS> bulbs, approximately how many of the screw-in lighting sockets in your business contained CFLs? (DO NOT READ)
1. (None of the sockets)
2. (Less than 5% of the sockets)
3. (More than 5% but less than 25% of the sockets)
4. (More than 25% but less than 50% of the sockets)
5. (More than 50% but less than 75% of the sockets)
6. (More than 75% of the sockets, but not all of the sockets)
7. (All of the sockets)
8. (Don't know)
9. (Refused)

P2b. What percentage of the screw-in lighting sockets in your business currently contain CFLs? (DO NOT READ)
1. (None of the sockets)
2. (Less than 5% of the sockets
3. (More than 5% but less than 25% of the sockets)
4. (More than 25% but less than 50% of the sockets)
5. (More than 50% but less than 75% of the sockets)

6. (More than 75% of the sockets, but not all of the sockets)
7. (All of the sockets)
8. (Don't know)
9. (Refused)

G1. Of the < TOTAL_BULBS> screw-in CFLs purchased since June 2011, what percentage of these bulbs would you estimate have been installed in your businesses? (DO NOT READ)
1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)
7. (1-9%)
8. (None)
98. (Don't know)
99. (Refused)

[ASK G2a IF G1<> 1, 98, OR 99]
G2a. Where are the bulbs that have not been installed? (DO NOT READ) [MULTIPLE RESPONSE. ACCEPT UP TO 4 RESPONSES]
1. (In Storage)
2. (Broken)
3. (Installed in a residential location)
4. (Returned to store)
5. (Installed but later removed)
6. (Given Away)
7. (Lost)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)
[ASK G2b IF G2A = 1, ELSE SKIP TO G3]
G2b. How many bulbs would you estimate are in storage?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[ASK G2c IF G2A = 1, ELSE SKIP TO G3]
G2c. What are you planning to do with the CFLs you have in storage? (DO NOT READ) [MULTIPLE RESPONSE]
1. (Waiting until an incandescent bulb burns out before replacing it)
2. (Waiting until a CFL burns out before replacing it)
3. (Waiting until a bulb (NO TYPE SPECIFIED) burns out before replacing it)
4. (Not planning to use them)
5. (Haven't decided)
00. (Other, Specify) [OPEN END]
98. (Don't know)

![NAVIGANT]

99. (Refused)

[ASK G2D IF G2c = 1, 2, OR 3]
QG2D. How many of the bulbs in storage do you expect to install within the next year …
   1.   All
   2.   Half,
   3. Some or
   4.   None of the stored bulbs
   00. (Other, Specify) [OPEN END]
   98. (Don't know)
   99. (Refused)

[ASK G3 IF G1 <> 8, 98, OR 99]
G3. To the best of your knowledge, were any of the [TOTAL_BULBS] screw-in CFLs purchased from [DISTRIBUTOR] installed <u>outside</u> of ComEd service territory?
   1.   (Yes)
   2.   (No)
   8.   (Don't know)
   9.   (Refused)

[ASK G3a IF G3 = 1]
G3a. What percentage of these bulbs would you estimate were installed outside of ComEd service territory?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

YR3 INSTALL Battery

[ASK THIS BATTERY IF G1 = 1-7]
[ASK G4 IF BUSINESSTYPE = "RESIDENTIAL" or C2 = 2 OR 5]
G4. Where were the majority of these CFLs Installed? Within a …
   1.   A Private Space such as a tenants unit or a guests room,
   2.   In a Common Space, such as a Hallway, Stairs or Lobby, or
   3.   In An Exterior Location
         00. (Other, Specify) [OPEN END]
   98. (Don't know)
   99. (Refused)

[ASK G4a IF G4 = 2 OR 3, ELSE SKIP TO G5]
G4a. On average, approximately how many hours would you estimate the CFLs installed in either Common areas or Exterior locations are turned on between the hours of 3:00 pm and 6:00 pm on summer weekdays?
   1. (None)
   2. (0.5 hour)
   3. (1 hour)
   4. (1.5 hours)
   5. (2 hours)
   6. (2.5 hours)
   7. (3 hours)
   8. (Don't know)

9. (Refused)

[ASK G4B IF G4 = 2 OR 3, ELSE SKIP TO G5]
G4b. Do you know whether any of these CFLs are controlled by occupancy or motion sensors?
   1. (Yes)
   2. (No)
   8. (Don't know)
   9. (Refused)

G5. In the majority of instances, what type of bulbs did the new CFL(s) replace? Would you say…
   1. All Incandescents
   2. Mostly Incandescents
   3. All CFLs
   4. Mostly CFLs
   5. Half Incandescents and Half CFLs
   6. Halogens
   7. Mixture of bulbs
  00. (Other, Specify) [OPEN END]
  98. (Don't know)
  99. (Refused)

G8. To the best of your knowledge are all of the screw-in CFLs purchased from [DISTRIBUTOR] that have been installed since June 2011 still in place, or have some been removed?
   1. (All still in place)
   2. (Removed some)
   3. (Removed all)
   8. (Don't know)
   9. (Refused)

[ASK G9 IF G8 = 2]
G9. What percentage of installed bulbs would you estimate have been removed?
   1. (100%)
   2. (90-99%)
   3. (80-89%)
   4. (50-79%)
   5. (20-49%)
   6. (10-19%)
   7. (1-9%)
   0. (Other Specify)
  98. (Don't know)
  99. (Refused)

[Ask G10 IF G8 = 2 OR 3, ELSE SKIP TO SO1]
G10. Why did you remove the CFL(s)? (DO NOT READ)(ACCEPT MULTIPLE)
   1. (Burned out/stopped working/broke)
   2. (Did not like the color)
   3. (Took too long to start up)

4.   (Not bright enough)

5.   (Didn't like the way it looked)

6.   (Didn't fit in the fixture)

7.   (Moved)

00.   (Other, Specify) [OPEN END]

98.   (Don't know)

99.   (Refused)

[Ask G12 IF G8 = 2 OR 3, ELSE SKIP TO SO1]
G12. What did you do with the CFL bulb(s) that were removed? (DO NOT READ) [MULTIPLE RESPONSE]

1.   (Moved it to a different location)

2.   (Gave it away)

3.   (Threw it away)

4.   (Recycled it)

5.   (Saved it for future use)

6.   (Returned it to the store for a refund)

00.   (Other, Specify) [OPEN END]

98.   (Don't know)

99.   (Refused)

<div align="center">

Self-Report Spillover

</div>

SO1.   In the time since you purchased the discounted CFLs from [DISTRIBUTOR] has your organization purchased and installed any efficient lighting products for your business at regular retail price, without any discounts?

1.   (Yes)

2.   (No)

8.   (Don't know)

9.   (Refused)

[ASK If SO1 = 1; ELSE SKIP TO P4]
SO1a.   I would like to learn more about the types of non-discounted CFLs bulbs you purchased. Standard CFLs are the most common type of CFL. They are made with a glass tube bent into a spiral, resembling soft-serve ice cream and fits in a regular light bulb socket. Specialty CFLs are another type of CFL. Specialty CFLs have special functions or features such as reflectors, dimmability, three-way lighting levels, or flood lighting. Did you purchase any non-discounted standard CFLs?

1.   (Yes)

2.   (No)

8.   (Don't know)

9.   (Refused)

SO1b. Did you purchase any non-discounted specialty CFLs?

1.   (Yes)

2.   (No)

8.   (Don't know)

9.   (Refused)

[ASK SO2a IF SO1 = 1]
SO2a. Approximately how many non-discounted efficient lighting products would you estimate have been purchased for your business since you purchased the discounted CFLs from [DISTRIBUTOR]?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[ASK SO3 IF SO1 = 1 , ELSE SKIP TO P4]
SO3. On a scale from 0-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement. My organizations experience with the discounted CFLs influenced our decision to install more efficient lighting products on our own.
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK SO4 IF SO1 = 1, ELSE SKIP TO P4]
SO4. Why did you purchase these lighting products at regular retail price and not a discounted price? (DO NOT READ) [MULTIPLE RESPONSE]
1. (The price discounts had ended, so I purchased the same lights at regular retail price)
2. (Although there were discounted CFLs available, the additional CFLs I purchased were not discounted)
3. (The price difference wasn't great enough)
4. (I bought the lighting at a store that did not have the price discounted bulbs)
5. (The price discounted CFLs had sold out)
6. (Needed/wanted them)
7. (Energy efficient/would save money on bill)
8. (Good value)
0. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

Process and CFL User Section

P4. On a scale of 0 to 10 where 0 means you were "not at all satisfied" and 10 means "very satisfied", how satisfied are you with the screw-in CFLs you purchased from [DISTRIBUTOR] between June 2011 and May 2012?
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK P5 IF P4 < 5]
P5. Why aren't you satisfied? [DO NOT READ]
1. (Delay when the lights turn on)
2. (Had to replace because it burned out)
3. (Do not like light general response)
4. (Dim/not bright enough)
5. (Do not last long)
6. (Do not fit socket)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

Purch1. When selecting screw-in bulbs for your business, how do you typically decide which bulbs to buy? (DO NOT READ LIST) [MULTIPLE RESPONSE]
1. (I typically buy CFLs)

2. (I typically buy incandescents)

3. (Based on what I need (type, wattage))

4. (Based on price)

5. (Based on what is on Sale)

6. (Based on availability in the store)

00. (Other)   [OPEN END] (RECORD VERBATIM)

98. (Don't know)

99. (Refused)

OT1. Have any regular screw-in incandescent bulbs been purchased for use in your business since June of 2011?

1. (Yes)

2. (No)

98. (Don't know)

99. (Refused)

[ASK BARRIER1-BARRIER7 IF OT1 = 1]

Barrier1-6. I'm going to read you a short list of reasons why you might have purchased incandescent bulbs instead of CFLs for your business. Using a scale of 0 to 10 where 0 equals "not significant at all," and 10 equals "very significant" please rank how significant the following factors were in your decision.. [ROTATE LIST]

Bar1. CFLs are too expensive

Bar2. Dissatisfied with past CFLs

Bar3. Do not like the way CFLs look in a fixture

Bar4. Do not like the quality of light CFLs produce

Bar5. CFLs are not bright enough

Bar6. Do not like that CFLs contain mercury

98. (Don't know)

99. (Refused)

Bar7. Are there any other factors that were not mentioned that have resulted in you purchasing incandescent bulbs for your business rather than CFLs?

[OPEN END; 98 = DK; 99 = REF]

LED1. Are you familiar with screw-in LED light bulbs that can be used to replace standard light bulbs?

1. (Yes)

2. (No)

98. (Don't know)

99. (Refused)

[SKIP IF LED1=2]

LED2. Have you ever purchased and installed screw-in LED bulbs in your business?

1. (Yes)

2. (No)

98. (Don't know)

99. (Refused)

LAW1. Are you aware of the change in federal light bulb regulations that began phasing in starting in January of 2012?

1. (Yes)

2. (No)

98. (Don't know)

99. (Refused)

[IF LAW1 = 2,8,9 THEN READ: "The new regulations will be phased in over 3 years and started in January of 2012 with the requirement that bulbs providing the brightness of a traditional 100-watt incandescent bulb provide that same light level using 72-watts or less, a 30% reduction in energy"]

LAW2. Do you believe these new regulations will impact the lighting products your organization installs in your business location(s)?

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

[ASK LAW3 IF LAW2 = 1]
LAW3. How so?
[OPEN END; 98 = DK; 99 = REF]

Firmographics

[READ "I have just a few questions left for statistical purposes only."]

F1. Would you estimate the total square footage of your facility at [SERV_ADDR] to be …?

1. Less than 2,500 square feet
2. 2,500 but less than 5,000 square feet
3. 5,000 but less than 10,000 square feet
4. 10,000 but less than 20,000 square feet
5. 20,000 but less than 50,000 square feet
6. 50,000 but less than 100,000 square feet
7. Agricultural/Outdoors
98. (Don't know)
99. (Refused)

F2. Does your business own, lease or manage the facility?

1. (Own)
2. (Lease)
3. (Manage)
98. (Don't know)
99. (Refused)

[ASK F2A IF F2 <> 1]
F2a. Does your company pay the electric bill?

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

F3. What are the primary types of lighting found at your business location?

1. Screw-in Bulbs
2. Linear FL
3. HighBay Lighting

00. (Other Specify)
98. (Don't know)
99. (Refused)

F4. What percentage of your monthly electricity bill is due to lighting?
[OPEN END; 98 = DK; 99 = REF]

F5. What are the other major electrical end uses at your facility?
1.   HVAC
2.   Appliances (DW, WM, Dryer)
3.   Industrial processes
4.   (None other than lighting)
5.   Other
98. (Don't know)
99. (Refused)

F6. In what year was your facility built? (IF NOT SURE, TAKE BEST GUESS)
[OPEN END NUMERIC – RECORD YEAR; 98 = DK; 99 = REF]

FINAL. ComEd is continually looking for ways to enhance its energy efficiency programs. Do you have any suggestions for improving their MidStream Incentives Program? [OPEN END; 98 = DK; 99 = REF]
END1. That is all of the questions I have for you today. Thank you very much for your time.