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Midstream Incentives Program
PY6 Evaluation Report

Final

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

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Commonwealth Edison Company

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Prepared by:

Luke Scheidler
Itron, Consulting and Analysis

Amy Buege
Itron, Consulting and Analysis

Itron

Opinion Dynamics

MichaelsEnergy

www.navigant.com

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Submitted to:

ComEd
Three Lincoln Centre
Oakbrook Terrace, IL 60181

Submitted by:

Navigant Consulting, Inc.
30 S. Wacker Drive, Suite 3100
Chicago, IL 60606

Contact:

Randy Gunn, Managing Director
312.583.5714
Randy.Gunn@Navigant.Com

Jeff Erickson, Director
608.497.2322
Jeff.Erickson@Navigant.Com

Rob Neumann, Associate Director
312.583.2176
Rob.Neumann@Navigant.Com

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Executive Summary

This report presents a summary of the findings and results from the Impact and Process Evaluation of ComEd's PY6 [1] Midstream Incentives Program. The primary component of Midstream Incentives covers lighting products and is branded as Business Instant Lighting Discounts (BILD) program. The BILD Program provides incentives to increase the market share of energy efficient compact fluorescent lamps (CFL), LEDs, Linear Fluorescents (LF), and High Intensity Discharge (HID) lamps sold to business customers. Additionally, linear fluorescent ballasts were added to the program offerings in PY6. The Midstream Incentives Program was launched as a pilot in PY3 and was a full scale program in PY4. The program was designed to provide an expedited, simple solution to business customers interested in purchasing efficient lighting by providing instant discounts at the point-of-sale.

E.1. Program Savings

Table E-1 summarizes the total electricity savings from the Retail and Distributor channels of the PY6 BILD Program. Tables E-1a and E-1b separate the overall PY6 savings into the portions attributable to the Retail and Distributor portfolios. Table E-1 includes PY6 net carryover savings, and additional information on PY6 carryover savings are presented in Table E-2.

Table E-1. PY6 BILD Program Total Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Program Savings[2]	242,194	NR[3]	NR
Verified Gross Program Savings	265,158	62	54
Verified Net Program Savings	167,049	39	34
Verified Net Carryover Savings	17,599	3.9	3.5
Verified Total PY6 Net Savings	184,648	42.9	37.5

Source: ComEd tracking data and Navigant team analysis.

[1] The PY6 program year began June 1, 2013 and ended May 31, 2014.

[2] The Ex Ante Gross Savings estimates shown in this table and the following Retail and Distributor tables have not been adjusted by the gross realization rate which applies the first year installation rate and interactive effect estimates.

[3] Not Reported by ComEd

Table E-1.a. PY6 BILD Program Retail Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Program Savings	51,874	NR	NR
Verified Gross Program Savings	60,064	14.0	12.4
Verified Net Program Savings	37,840	8.8	7.8

Source: ComEd tracking data and Navigant team analysis.

Table E-1b. PY6 BILD Program Distributor Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Program Savings	190,319	NR	NR
Verified Gross Program Savings	205,094	48.0	41.6
Verified Net Program Savings	129,209	30.2	26.2

Source: ComEd tracking data and Navigant team analysis.

Table E-2. PY6 BILD Program Electric Savings from Carryover

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Carryover Savings	27,637	NR	NR
Verified Gross Carryover Savings	28,119	6.2	5.5
Verified Net Carryover Savings	17,599	3.9	3.5

Source: ComEd tracking data and Navigant team analysis.

E.2. Program Savings by Bulb Type and Channel

Tables E-3a, E-3b, E-4a, E-4b, E-5a, and E-5b summarize the electricity savings from the ComEd PY6 BILD Program by program bulb type and distribution channel. As these tables show, CFLs made up more than 30% of the total program Verified Net MWh and Peak MW savings (33% and 34%, respectively), LEDs accounted for 60% of both Verified Net MWh and Peak MW, and linear fluorescent lamps made up approximately 5% of both Verified Net MWh and Peak MW.

Table E-3a. PY6 BILD Retail Program MWh Results by Measure[4]

Savings Category	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	LF Ballasts
Ex Ante Gross Savings (MWh)	20,512	9	23,645	7,685	24	0	0
Unadjusted Gross Savings (MWh)	21,110	9	24,253	9,561	12	0	0
Verified Gross Savings (MWh)	18,175	8	29,994	11,877	10	0	0
Verified Net Savings (MWh) †	11,450	5	18,896	7,482	6	0	0

Source: ComEd tracking data and Evaluation team analysis.
† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

Table E-3b. PY6 BILD Distributor Program MWh Results by Measure[5]

Savings Category	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	LF Ballasts
Ex Ante Gross Savings (MWh)	29,352	49,419	91,216	0	18,156	799	1,378
Unadjusted Gross Savings (MWh)	29,906	50,341	81,856	13,267	18,072	759	1,371
Verified Gross Savings (MWh)	25,748	43,889	101,235	16,480	15,630	924	1,187
Verified Net Savings (MWh) †	16,221	27,650	63,778	10,382	9,847	582	748

Source: ComEd tracking data and Evaluation team analysis.
† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

Table E-4a. PY6 BILD Retail Program MW Results by Measure

Savings Category	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	LF Ballasts
Ex Ante Gross Savings (MW)	NR	NR	NR	NR	NR	NR	NR
Unadjusted Gross Savings (MW)	6.5	0.0	7.4	2.1	0.0	0.0	0.0
Verified Gross Savings (MW)	4.5	0.0	7.4	2.1	0.0	0.0	0.0
Verified Net Savings (MW) †	2.9	0.0	4.6	1.3	0.0	0.0	0.0

Source: ComEd tracking data and Evaluation team analysis.
† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

[4] These tables do not include Carryover savings. Similar Carryover tables are included in Section 3 of this report.
[5] These tables do not include Carryover savings. Similar Carryover tables are included in Section 3 of this report.

Table E-4b. PY6 BILD Distributor Program MW Results by Measure

Savings Category	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	LF Ballasts
Ex Ante Gross Savings (MW)	NR	NR	NR	NR	NR	NR	NR
Unadjusted Gross Savings (MW)	9.2	15.2	25.0	2.9	4.0	0.2	0.3
Verified Gross Savings (MW)	6.4	10.6	24.9	2.9	2.8	0.2	0.2
Verified Net Savings (MW) †	4.0	6.7	15.7	1.8	1.7	0.1	0.1

Source: ComEd tracking data and Evaluation team analysis.
† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

Table E-5a. PY6 BILD Retail Program Peak MW Results by Measure

Savings Category	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	LF Ballasts
Ex Ante Gross Savings (Peak MW)	NR	NR	NR	NR	NR	NR	NR
Unadjusted Gross Savings (Peak MW)	4.1	0.0	4.4	1.4	0.0	0.0	0.0
Verified Gross Savings (Peak MW)	4.1	0.0	6.3	1.9	0.0	0.0	0.0
Verified Net Savings (Peak MW) †	2.6	0.0	4.0	1.2	0.0	0.0	0.0

Source: ComEd tracking data and Evaluation team analysis.
† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

Table E-5b. PY6 BILD Distributor Program Peak MW Results by Measure

Savings Category	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	LF Ballasts
Ex Ante Gross Savings (Peak MW)	NR	NR	NR	NR	NR	NR	NR
Unadjusted Gross Savings (Peak MW)	5.8	8.8	14.9	1.9	2.7	0.1	0.2
Verified Gross Savings (Peak MW)	5.8	8.7	21.4	2.7	2.6	0.2	0.2
Verified Net Savings (Peak MW) †	3.6	5.5	13.5	1.7	1.6	0.1	0.1

Source: ComEd tracking data and Evaluation team analysis.
† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

E.3. Impact Estimate Parameters for Future Use

In the course of our PY6 study, the evaluation team conducted research on parameters used to estimate program impacts. Some of these parameters are eligible for deeming for PY8 or for inclusion in future versions of the Illinois TRM. Table E-6 shows the evaluation team's parameter updates available for future use.

Table E-6. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
Res/Non-Res Split	4% / 96% CFLs, LEDs 1% / 99% Fixtures, LF, HID	3-year rolling average (PY4-PY6) of Evaluation Research Findings[6]
1st Year Installation Rate	71% CFLs 96% LEDs, HID 98% LF	3-year rolling average (PY4-PY6) of Evaluation Research Findings
NTGR	0.66 CFLs 0.75 LEDs, HID 0.59 LF	3-year rolling average (PY4-PY6) of Evaluation Research Findings[7]
	0.68 CFLs 0.77 LEDs, HID 0.61 LF	PY6 Evaluation Research Findings

Source: Evaluation Analysis

E.4. Program Volumetric Detail

Table E-7 shows that the BILD program incentivized 333,248 lamps and fixtures through the retail channel and 2,087,861 lamps, fixtures, and ballasts through the distributor channel for a total of 2,421,109 units, which was nearly 30% greater than PY3, PY4, and PY5 program sales combined. Applying the deemed installation rates from PY6 results in a total of 1,928,802 PY6 program bulbs installed this program year. When combined with PY4 and PY5 carryover bulbs installed in PY6, 2,157,937 units were installed (Table E-8). Table E-9 displays the number of enrolled and participating distributors, retailers, and end-users.

[6] LEDs, linear fluorescent lamps, and HID lamps were not offered through the program in PY4 so estimates of Res / Non-Res split, installation rate, and NTGR for these products is only based on data from PY5 and PY6.
[7] Data for LED, HID, and linear fluorescent lamp types only available from PY5 and PY6.

Table E-7. PY6 Incentivized Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs[8]	LEDs[9]	Linear FLs	HIDs	LF Ballasts	Total
PY6 Retail	139,320	58	193,000	870	n/a	n/a	333,248
PY6 Distributor	204,257	362,274	611,299	840,033	2,607	67,391	2,087,861
PY6 Total	**343,577**	**362,332**	**804,299**	**840,903**	**2,607**	**67,391**	**2,421,109**
PY5 Total	249,799	347,639	211,955	503,627	2,799	n/a	1,315,819
PY4 Total	194,180	381,072	n/a	n/a	n/a	n/a	575,252
PY3 Total	4,173	929	n/a	n/a	n/a	n/a	5,102

Source: ComEd tracking data and Navigant team analysis.

Table E-8. PY6 Installed Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs	LEDs	Linear FLs	HIDs	LF Ballasts	Total
PY6 Incentivized Bulbs	343,577	362,332	804,299	840,903	2,607	67,391	2,421,109
PY6 1st Year Installed Bulbs	238,786	254,357	801,484	840,483	1,812	67,357	1,928,802
PY4 Carryover Bulbs – installed in PY6	26,445	51,898	n/a	n/a	n/a	n/a	78,344
PY5 Carryover Bulbs – installed in PY6	38,469	34,764	0	77,559	0	n/a	150,792
Total Installed Bulbs in PY6	303,700	341,019	801,789	661,986	2,606	46,837	2,157,937

Source: ComEd tracking data and Navigant team analysis.

Table E-9. PY6 BILD Participating Distributors, Retailers, and End-Users

Program Participants	Enrolled	Participating
Distributors	128	89
Retailers	1	1
End-Users	NA	~5,500[10]

Source: ComEd tracking data and Navigant team analysis.

[8] Cold Cathode FL and High Wattage CFLs (>=40 Watts) are included in the Specialty CFL category.
[9] Includes 44,486 LED Fixtures in the Retail Program and 57,097 LED Fixtures in the Distributor Program.
[10] The exact number of unique end users is unknown due to multiple various name and address combinations for the same end-user in the tracking data.

E.5. Results Summary

The following table summarizes the key metrics from PY6.

Table E-10. PY6 Results Summary

Key Metrics	Units	Retail Channel	Distributor Channel	PY6 Carryover	PY6 Total
Unadjusted Gross Savings	MWh	54,944	195,571	n/a	250,516
Unadjusted Gross Demand Savings	MW	16.0	56.7	n/a	72.8
Unadjusted Gross Peak Demand Reduction	MW	9.9	34.4	n/a	44
Verified Gross Savings	MWh	60,064	205,094	28,119	293,277
Verified Gross Demand Reduction	MW	14.0	48.0	6.2	68.2
Verified Gross Peak Demand Reduction	MW	12.4	41.6	5.5	59
Verified Net Savings†	MWh	37,840	129,209	17,599	184,649
Verified Net Demand Reduction†	MW	8.8	30.2	3.9	42.9
Verified Net Peak Demand Reduction†	MW	7.8	26.2	3.5	37

Source: ComEd tracking data and Navigant team analysis

† Net savings reflective of a net to gross ratio of 0.63. Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

E.6. Key Findings and Recommendations[11]

The PY6 goal of the BILD Distributor Program was to achieve 100 GWh of gross energy savings. The PY6 Gross Verified Energy Savings from the Distributor Program were estimated to be 205,094 MWh, more than twice the program goal. An additional 60,064 MWh from the Retail portion of the program put total Gross Verified Energy Savings from the BILD Program at 265,158 MWh. Thirty-three percent of these savings were from CFLs, 60% from LEDs, six percent from linear fluorescents, and one percent from linear fluorescent ballasts and HID lamps. Numbering of Findings and Recommendations correspond to numbering of Findings and Recommendations in Section 6.

Midstream Program Evaluation

Finding 1. In order to achieve a statistically representative sample, the evaluation team estimated that 500 end-user survey completes would be necessary. Given the approximate 10% end-user survey completion rate experienced by the evaluation team, it would have been necessary to obtain contact information for every program participant to meet the 500 survey goal, which is difficult given the midstream delivery mechanism.

Recommendation 1. This finding has been stated in the prior three evaluation reports and, as such, the evaluation team recommends a meeting between the ComEd BILD Program

[11] Numbered findings and recommendations in this section are the same as those found in the Findings and Recommendations section of the evaluation report for ease of reference between each section. Not all of the findings and recommendations are included in the executive summary.

Managers, the BILD Program Implementers, and select BILD Program Distributors in advance of PY8 to discuss data collection options. One possibility would be to switch to a web survey format closer to the time of purchase, though obtaining end-user e-mail addresses would be a persistent challenge.

Program Tracking Data

Finding 3. The bulb information database contained exact matches for all model numbers in the tracking data. However, for a number of products, there were multiple entries for the same bulb model number that had conflicting information. This led to incorrect baseline or measure wattages being assigned initially. It was determined that these multiple records were due to outdated entries in the database (i.e., from prior program years). A quality control assessment of the information in the bulb information database was conducted that identified a number of additional model numbers with incorrect bulb information (wattage, lumens, or bulb type).

Recommendation 3a. A field should be added to the EFI_BIZ_LTG_LKUP table that specifies the program year. This would ensure the most up-to-date bulb information is appended to the tracking data. This recommendation was conveyed to ComEd and the program implementer early in the evaluation process, and the database is in the process of being verified and updated.

Verified Gross Impacts and Installed Savings Realization Rate[12]

Finding 4. The PY6 Gross Verified Energy Savings were estimated to 265,158 MWh of which 23% was attributable to the Retail Program and 77% was attributable to the Distributor Program. The Installed Savings Realization Rate on this savings estimate is 106%. This Realization Rate is primarily driven by the high 1st year installation rate for LEDs, which was 100% for both LED lamps and fixtures. Also contributing to the high Installed Savings Realization Rate was the high energy interactive effects for non-residential installations.[13]

Evaluation Research Gross Impacts and Realization Rate

Finding 6. The Evaluation Research Gross Realization Rate[14] was 94%. As compared to Verified Savings, Evaluation Research savings are lower primarily due to a three percent reduction in the installation rate for LEDs (from 100% to 97%). Also contributing is a 13% reduction in average delta watts for LEDs that results from switching from the currently one-size fits all lumen mapping for directional LEDs in IL TRM v2.0 to the bulb shape specific mapping used to estimate the Evaluation Research results. The bulb shape specific mapping is also what is included in the IL TRM v3.0.

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[12] The Verified Gross Installed Savings Realization Rate adjusts the Unadjusted Gross savings estimates to account for the 1st year installation rate and any interactive effects associated with the measure. It is different from them Ex Ante realization rate which is the ratio of the ex post verified savings estimate over the ex ante savings estimate.

[13] Energy interactive effects reflect a reduction in a building's cooling load due to the reduction in heat given off by incandescent bulbs.

[14] The Evaluation Research Gross Realization Rates are equal to the Evaluation Research Gross Savings estimate / Verified Savings Gross savings estimate.

Recommendation 6. The large decrease in delta watts for LEDs is worth exploring through further research given their expanding influence in the program. Although the Evaluation Research lumen equivalencies are grounded in the federal standards for incandescent lamps, initial review of LED manufacturer product specifications indicates that the reported incandescent equivalencies do not always align with the Federal lumen requirements of a similar incandescent lamp. ComEd is currently in the process of internally developing a new incandescent wattage equivalency methodology for directional LED lamps. ComEd and the evaluation team should work together to determine the appropriate scope of evaluation research into this topic, potentially including bench testing and manufacturer interviews.

Evaluation Research Net Impacts

Finding 8. The Net-to-Gross Ratios (NTGR) found in the PY6 evaluation are 0.68 for CFLs, 0.77 for LEDs and 0.61 for linear fluorescent lamps. These NTGRs are 3%, 10%, and 9% higher, respectively, than the PY5 Evaluation Research findings. Compared to the PY6 program-wide deemed NTGR (0.63),[15] the PY6 Evaluation Research results are 22% higher for LEDs, 8% higher for CFLs, and 3% lower for linear fluorescent lamps. The observed variability in NTGR lends further support to the PY5 recommendation to update the deemed NTGR estimates based on a bulb-weighted rolling 3-year NTGR rolling average of Evaluation Research results. This rolling average provides consistency from year-to-year and ensures that the NTGR results from any single year do not drastically alter the resulting net savings. It should be noted that if a significant changes are made to the BILD Lighting Program that would render the 3-year rolling average NTGR inappropriate, and would justifiably warrant a revised NTGR estimate away from the 3-year rolling average, this should be considered.

Barriers to Reduced-Wattage Linear Fluorescent Adoption.

Finding 9. Surveys with distributors and end-users indicated that cost and a lack of familiarity of the reduced wattage linear fluorescent bulbs available were the primary barriers to efficient lighting purchases. While 88% of end-users purchasing linear fluorescents report being "somewhat familiar" or "very familiar" with reduced wattage linear fluorescents before their purchase, survey results and distributor interviews indicate that many end-users report being aware of the reduced wattage options but seem misinformed on actual product performance. ComEd goes to great effort to develop marketing materials and to train program distributors, but only 55% of distributors report receiving marketing materials and only 75% of those report using the materials. This indicates that only about 40% of distributors are using the provided materials.

Recommendation 9. The program should consider talking in greater detail with distributors one-on-one to find out if the program could provide additional materials that would help educate end-users on the minor incremental cost and short payback period associated with reduced wattage linear fluorescents purchased with the program discount.

Complete findings and recommendations can be found in Section 6.

[15] Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

1 Introduction

1.1 Program Description

The Non-Residential BILD Program provides incentives to increase the market share of energy efficient lighting products commonly sold to business customers. The BILD Program was launched as a pilot in PY3 (originally called the Midstream Incentives Program) and was a full scale program in PY4. The program was designed to provide an expedited, simple solution to business customers interested in purchasing efficient lighting by providing instant discounts at the point of sale.

At this time the program provides incentives on a mix of standard, specialty, high-wattage and cold-cathode CFLs, LEDs (lamps and fixtures), Linear Fluorescent (LF) lamps and ballasts, and High Intensity Discharge (HID) lamps. The PY6 rebate values vary by technology, as follows:

- Screw-in CFLs range from $1 (standard) to $3 (specialty) per bulb;
- LEDs (screw based and pin based) $4 to $10;
- LED trim kit $13;
- Linear fluorescent lamps and ballasts $1; and
- HID lamps range from $10 to $25.

In PY6, BILD program sales came from a total of 89 unique distributors (this is an increase from 75 unique distributors in PY5) and approximately 5,500 unique end users.[16] Eighty-six percent of BILD program unit sales were delivered via the "Distributor Program", while the remaining 14% were sold through the "Retail Program," which sells bulbs directly to contractors through the pro desk of a major Do-it-Yourself retailer.

1.2 Evaluation Objectives

The Evaluation Team identified the following key researchable questions for PY6:

1.2.1 Impact Questions

1. What is the level of gross annual energy (kWh) and peak demand (kW) savings induced by the program?
2. What are the net impacts from the program? What is the level of free ridership associated with this program for Standard and Specialty CFLs, LEDs and Linear FL? What is the participant spillover from the program?[17]
3. Did the program meet its energy and demand goals? If not, why not?

1.2.2 Process Questions

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

[16] The exact number of unique end users is unknown due to multiple various name and address combinations for the same end-user in the tracking data.

[17] For HID lamps and LF ballasts, calculating bulb type specific impact parameters is not feasible due to the small number of units sold and participating end users.

2. What is the end-users' experience and satisfaction with the BILD Program and program bulbs?
3. How aware are customers of the ComEd-sourced bulb discounts? How effective are the in-store promotional materials?
4. What factors are contributing to the rapid increases in LED sales?
5. Given the similarity in product attributes other than energy usage, what factors are preventing reduced wattage linear fluorescents from being the industry standard?
6. How aware are customers of changes in available lighting products as a result of EISA 2007 implementation? How have customers lighting purchasing decisions been affected by the changes in the options available for purchase?

2 Evaluation Approach

The analytical methods used for the evaluation of the Business Instant Lighting Discounts Program were driven to a large extent by the data available for programs that are delivered midstream at the distributor level such as this one. This delivery approach, while allowing for ease of program implementation and customer participation, increases the complexity of the program evaluation, since the program participants cannot be easily identified. As described below, a variety of data sources were used to estimate gross and net parameters and impacts for CFLs, LEDs, and linear fluorescent lamps. Because HID lamps and linear fluorescent ballasts comprised less than 1% of program savings, there were no research efforts directed specifically at establishing unique impact parameters for these product categories.

2.1 *Overview of Data Collection Activities*

The core data collection activities for the evaluation of the PY6 BILD Program included in-depth telephone interviews with key program staff and participating lighting distributors, and CATI telephone surveys with BILD end-users. Other primary data sources used to complete the evaluation included analysis of the program tracking database, tracking spreadsheets from the program implementers, and the Illinois Technical Reference Manual.[18] The full set of data collection activities is shown in Table 2-1 and Table 2-2.

Table 2-1. Primary Data Collection Activities

What	Who	Target Completes	Completes Achieved	When	Comments
Program Tracking Database	Participants	NA	NA	July – Oct. 2014	*Data supporting Gross and Net impact assessment*
In Depth Interviews	ComEd BILD Program Manager	1	1	Feb. 2014	*Data collection supporting Gross and Net impact assessment and process analysis in the same instrument.*
	BILD Program Implementer (DNV GL)	1	1	Apr. 2014	
	BILD End-Users	5-10	9	Sept. 2014	
CATI Survey	BILD End-Users	500[19]	282	July – Aug. 2014	
Web Survey	BILD Distributors	Census	51	June – July 2014	

Table 2-2. Additional Resources

Reference Source	Author	Application	Gross Impacts	Process
Illinois TRM	VEIC	Verified Savings Ex Ante Assumptions	X	

[18] State of Illinois Energy Efficiency Technical Reference Manual. Final, As of June 7th, 2013. Effective: June 1st, 2013.
[19] The goal of 500 completes was established before the program year was complete. Program tracking data through February of 2014 was used to forecast the number of program end-users purchasing each bulb type (CFL, LED, LF). Target completes were set to achieve a 90%/10% sampling precision by bulb type based on the end-user forecast.

2.2 *Verified Savings Parameters*

Verified Gross and Net Savings (energy and coincident peak demand) resulting from the PY6 Program were calculated using the following algorithms as defined by the Illinois TRM version 2.0:[20]

Verified Gross Annual kWh Savings = Program bulbs * Delta Watts/1000 * HOU * IEe* ISR
Verified Gross Annual kW Savings = Program bulbs * Delta Watts/1000 * ISR
Verified Gross Annual Peak kW Savings = Gross Annual kW Savings * Peak Load CF * IEd * ISR

Where:

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

The following table presents the parameters that were used in the verified gross and net savings calculations and indicates which were examined through evaluation activities and which were deemed. Deemed parameters from the TRM were used directly in all cases except where the TRM specifies that the deemed parameters may be weighted by bulb type or installation location (e.g. hours of use and peak coincidence factor). A full description of how evaluation research was used to weight specific parameters is included in Section 3.3.

Table 2-3. Verified Savings Parameter Data Sources

Verified Savings Input Parameters	Data Source	Deemed or Evaluated?
Program Bulbs	PY6 Program Tracking Data	Evaluated
Delta Watts	TRM v2.0	Deemed
Res / Non-Res Split	TRM v2.0	Deemed
Hours of Use (HOU)	TRM v2.0, PY6 Tracking Data, PY6 End User Survey	Deemed / Evaluated
Peak Coincidence Factor (CF)		Deemed / Evaluated
Energy Interactive Effects		Deemed
Demand Interactive Effects		Deemed
Installation Rate	TRM v2.0	Deemed
NTGR	Statewide Advisory Group process (EEPS)[21]	Deemed

[20] Source: http://www.ilsag.info/technical-reference-manual.html
[21] ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

2.2.1 Verified Gross Program Savings Analysis Approach

The evaluation team calculated verified savings by measure based upon available data. For PY6, the evaluation team calculated verified savings for standard CFLs, specialty CFLs, LED bulbs and Linear FL bulbs. The sample sizes of LED fixtures, HID bulbs, and linear fluorescent ballasts were too small to estimate separate parameters for these bulb types.

The data used to estimate the Verified Gross Program savings came from the PY6 program tracking data, TRM v2.0, and PY6 end-user telephone surveys. Tracking data and data from the end-user telephone surveys were used to weight[22] the deemed parameters found in the TRM.

2.2.2 Verified Net Program Savings Analysis Approach

Verified net energy and demand (coincident peak and overall) savings were calculated by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). In PY6, the NTGR estimates used to calculate the Net Verified Savings were based on past evaluation research and defined through a negotiation process through SAG as documented in a spreadsheet.[23]

2.3 Process Evaluation

The process evaluation of the PY6 BILD program assessed the program processes impacting distributors and end-users who participated in the program. On the distributor side, the evaluation explored sales methods and target markets, program marketing and perceived customer awareness of program, satisfaction with the program, challenges and barriers to participation, federal regulatory changes and distributor recommendations for program improvement. For end-users, the reach of program marketing, types of participating end-users, usage of and purchasing decisions for CFLs, LEDs and High-Efficiency Linear Fluorescent bulbs, federal regulatory changes, program discounts, and satisfaction and barriers to purchasing program bulb types were explored. Data sources for the process evaluation include the distributor surveys (n=51) and the end-user telephone survey (n=282).

[22] Overall HOU, Peak CF and IE verified savings estimates were calculated by weighting the distinct Residential and Non-residential estimates for these parameters found within TRM v2.0 by bulb type and business type from the PY6 end-user telephone survey and tracking data.

[23] Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

3 Gross Impact Evaluation

This section presents the results of the Verified Gross Impact findings.

3.1 Tracking System Review

The Business Instant Lighting Discounts Tracking Database included all program sales since the program inception. A number of data cleaning steps were taken to make sure PY6 bulb sales were complementary and non-overlapping with bulb sales attributed to previous program years. A small number of bulbs sold in PY5 were counted as PY6 sales due to a delay in the invoicing of the bulbs and thus their exclusion from the bulbs analyzed in PY5. The PY6 analysis dataset was finalized based on the most recent program tracking database received from ComEd (dated July 7, 2014). This dataset contained sales data for a 37,037 transactions corresponding to the sale of 2,190,732 unit sales (bulbs, fixtures, and ballasts). Of these unit sales, 2,182,495 were found to have been sold during PY6, and 8,237 were sold during the PY5 date range but were invoiced after the PY5 cutoff and so are counted as PY6 sales. Total sales volumes matched those reported by ComEd. However, there were several evaluation challenges related to the tracking data.

In addition to the transaction data, the evaluation team was also provided a bulb information lookup database called "EFI_BIZ_LTG_LKUP." This table includes important bulb information such as wattage, lumens, and lamp type. While this table included all bulb models sold in PY6 and was generally easy to match with the tracking data, there were also several issues identified in the bulb information database. The issues identified in the tracking and bulb information databases are outlined below.

First, some fields in the tracking data were not consistent between the retail and distributor portions of the BILD program. For the distributor program, the total number of bulbs is equal to the sum of the "Quantity" field and for the retail program, the total number of bulbs is equal to the sum of the "Quantity" field times the "Pack_Size" field. For ease of use, the fields in the tracking data should be made consistent between the two segments of the program. Additionally, the field names should be made very explicit (e.g. "# of Packages," "Units per Pack," "Total Unit Quantity").

As for the bulb information database, a number of products had multiple entries for the same bulb model number that had conflicting information. This led to incorrect baseline or measure wattages being assigned initially. It was determined that these multiple records were due to outdated entries in the database (i.e., from prior program years). To avoid this, a field should be added to the EFI_BIZ_LTG_LKUP table which specifies the program year. This would ensure the most up-to-date bulb information is appended to the tracking data. This recommendation was conveyed to ComEd and the program implementer early in the evaluation process, and the database is in the process of being verified and updated.

Additionally, in the process of identifying duplicate entries, a quality control assessment of the information in the bulb information database was conducted which identified a number of additional model numbers with incorrect bulb information (wattage, lumens, or bulb type). Due to the number of program bulbs models (~1,800 in PY6), it is not practical for the evaluation team to perform individual

manufacturer specification sheet lookups to verify bulb information (wattage, lumens, bulb type). The current bulb information database is based on performance data supplied by either the manufacturer or the participating distributors. The evaluation team agrees this is the best method for establishing product characteristics. However, due to the number of discrepancies observed in the internal QC process, it is recommended that the top ~50 models with the highest sales volume be subjected to manufacturer specification sheet verification in each program year.

Finally, while the BILD lighting lookup table was updated in PY5 to include lamp type (standard, specialty, directional, decorative, etc.), there are no fields for specialty bulb type (candelabra, globe, etc.), dimmable/non-dimmable, or reflector bulb type. To accurately determine delta watts using the evaluation recommended lumen mapping, the lookup table should include specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.). Because the IL TRM v3.0 requires a lumen mapping by specific bulb type for some product categories, it would be beneficial to include these descriptions in the bulb information database.

3.2 *Program Volumetric Findings*

As shown in Table 3-1, the total number of bulbs sold during the PY6 BILD Program is estimated to be 2,421,109, which is an 84% increase from the bulbs sold in PY5. Fourteen percent of these were standard CFLs, 15% were specialty CFLs,[24] 33% were LEDs,[25] 35% were linear fluorescents, 3% were linear fluorescent ballasts, and the remaining 0.1% was HID lamps (product sales are represented graphically in Figure 3-1). Compared to PY5, the number of standard CFLs, specialty CFLs, LEDs, and linear fluorescent lamps all increased. The increases in sales are most dramatic for LEDs, which nearly quadrupled, and linear fluorescent lamps, which increased by 67%. The sales generated through the Retail Program were small for most product categories. For standard CFLs and LEDs, however, the Retail Program accounted for 41% and 24% of sales within each category.

Table 3-1. PY6 Incentivized Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs[26]	LEDs[27]	Linear FLs	HIDs	LF Ballasts	Total
PY6 Retail	139,320	58	193,000	870	n/a	n/a	333,248
PY6 Distributor	204,257	362,274	611,299	840,033	2,607	67,391	2,087,861
PY6 Total	343,577	362,332	804,299	840,903	2,607	67,391	2,421,109
PY5	*249,799*	*347,639*	*211,955*	*503,627*	*2,799*	*n/a*	*1,315,819*
PY4	*194,180*	*381,072*	*n/a*	*n/a*	*n/a*	*n/a*	*575,252*
PY3	*4,173*	*929*	*n/a*	*n/a*	*n/a*	*n/a*	*5,102*

Source: ComEd tracking data and Navigant team analysis.

[24] Including Cold Cathode FL lamps and High Wattage CFLs (>=40 Watts).
[25] Including LED Fixtures.
[26] Cold Cathode FL and High Wattage CFLs (>=40 Watts) are included in the Specialty CFL category.
[27] Includes 44,486 LED Fixtures in the Retail Program and 57,097 LED Fixtures in the Distributor Program.

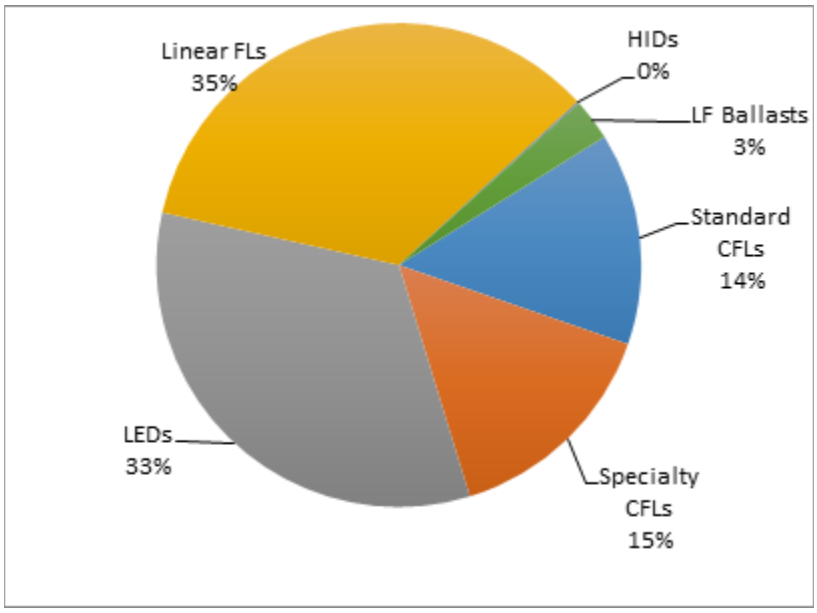
Table 3-2 provides the volume of bulbs incentivized through the Residential ES Lighting program estimated to have been installed during the PY6 program year. This includes bulbs sold in prior program years and installed in PY6.

Table 3-2. PY6 Installed Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs	LEDs	Linear FLs	HIDs	LF Ballasts	Total
PY6 Incentivized Bulbs	343,577	362,332	804,299	840,903	2,607	67,391	2,421,109
PY6 1st Year Installed Bulbs	238,786	254,357	801,484	840,483	1,812	67,357	2,204,279
PY4 Carryover Bulbs – installed in PY6	26,445	51,898	n/a	n/a	n/a	n/a	78,344
PY5 Carryover Bulbs – installed in PY6	38,469	34,764	0	77,559	0	n/a	150,792
Total Installed Bulbs in PY6	303,700	341,019	801,484	918,041	1,812	67,357	2,433,414

Source: ComEd tracking data and Navigant team analysis.

Figure 3-1. Number of Measures Installed by Type



Source: Evaluation Analysis

Table 3-3 displays the number of enrolled and participating distributors, retailers, and end-users.

Table 3-3. PY6 Enrolled and Participating Distributors, Retailers, and End-Users

Program Participants	Enrolled	Participating
Distributors	128	89
Retailers	1	1
End-Users	NA	~5,500[28]

3.3 Gross Program Impact Parameter Estimates

The EM&V team conducted research to validate and supplement parameters that were not fully specified in the TRM. Namely, evaluation research provided bulb type and business type information that were used to weight verified savings parameters for residential and non-residential installations. The resulting verified savings parameters used in PY6 that may vary by distribution channel are included in Table 3-4 and those parameters that may vary by installation location are included in Table 3-5. These tables include one value if the Ex Ante and Verified Savings parameter estimates are the same. The tables include two values where the ex ante and verified parameters are different. The differences are explained in the section after the tables.

[28] The exact number of unique end users is unknown due to multiple various name and address combinations for the same end-user in the tracking data.

Table 3-4. Verified Gross Savings Parameters by Distribution Channel

Gross Impact Parameters	Bulb Type	Ex Ante	PY6 Verified Savings[29]	
			Retail	Distributor
Program Bulb Sales	Standard CFLs	343,577	139,320	204,257
	Specialty CFLs	362,332	58	362,274
	LED Bulbs	759,813	148,514	554,202
	LED Fixtures	44,486	44,486	57,097
	Linear FL	840,903	870	840,033
	HID	2,607	0	2,607
	Ballasts	67,391	0	67,391
	All Bulbs	2,421,109	333,248	2,087,861
Delta Watts	Standard CFLs	45.4	46.8	45.3
	Specialty CFLs	42.7	46.0	41.9
	LED Bulbs	47.3	49.4	38.1
	LED Fixtures	37.8	39.5	45.1
	Linear FL	4.7	3.0	4.7
	HID	66.9	0.0	66.9
	Ballasts	4.5	0.0	4.5
	All Bulbs	30.2	46.9	25.2
Res/Non-Res	CFL and LED Bulbs			8% / 92%
	LF, LED Fixtures, HID			1% / 99%
Carryover Bulbs	PY4 and PY5 Sales			229,135

Source: ComEd tracking data and Navigant team analysis.

[29] Based on deemed parameters from the IL TRM (v2.0).

Table 3-5. Verified Gross Savings Parameters by Installation Location

Gross Impact Parameters	Bulb Type	Ex Ante	PY6 Verified Savings	
			Residential	Non-Residential
Installation Rate	Standard CFLs			69.5%
	Specialty CFLs	69.5%	79.5%	69.5%
	LED Bulbs	69.5%	95%	100%
	LED Fixtures	69.5%	95%	100%
	Linear FL			69.50%
	HID	69.5%	95%	100%
	Ballasts			69.50%
	All Bulbs	69.5%	79.5%	79.7%
Hours of Use	Standard CFLs	3,198[30]	938	3,407
	Specialty CFLs		930	3,499
	LED Bulbs		969	3,454
	LED Fixtures	4,576	1,010	4,568
	Linear FL			4,591
	HID			4,384
	Ballasts			4,587
Peak CF	Standard CFLs	0.66	0.10	0.66
	Specialty CFLs		0.09	0.62
	LED Bulbs		0.10	0.64
	LED Fixtures			0.66
	Linear FL			0.68
	HID			0.67
	Ballasts			0.71
Interactive Effects	Standard CFLs	1.24 / 1.46	1.04 / 1.07	1.24 / 1.45
	Specialty CFLs			1.26 / 1.43
	LED Bulbs			1.24 / 1.44
	LED Fixtures			1.24 / 1.41
	Linear FL			1.24 / 1.40
	HID			1.22 / 1.45
	Ballasts			1.25 / 1.39

Source: ComEd tracking data and Navigant team analysis.

[30] Ex Ante Estimates for HOU, Peak CF and Interactive Effects are all Non-Residential.

3.3.1 Unit Sales

The only difference in unit sales between Ex Ante and Verified Savings is the LED lamps and fixtures. There were 57,097 LED trim kits that were classified as lamp measures by ComEd instead of fixtures. This misclassification has no effect on savings impacts (other than to shift impacts from one product category to the other).

3.3.2 Delta Watts

The average delta watts values for Ex Ante and Verified Savings show differences for standard and specialty CFLs and for LED lamps and fixtures. The minor differences for CFLs are driven by small adjustments made by the evaluation team to either the bulb wattage or the lumen output data. These adjustments were made after a QC review process of approximately 50 of the highest sales volume CFL and LED models. Additionally, the commercial section of the v2.0 TRM for CFLs does not designate between standard and specialty lamp types. There is only one lumen mapping for delta watts for all CFL lamp types. Thus, the EISA regulations for omni-directional lamps are being applied to all CFL lamp types, including exempt bulbs. This has the effect of reducing the deemed baseline wattage for certain specialty lamps (especially reflectors). The residential section of the TRM does include a separate mapping for specialty CFL lamps that is in line with EISA (for omni-directional lamps) and EPACT (for directional lamps) and is a more technically accurate method of establishing baseline wattage for these EISA exempt bulb types. Given this, the evaluation team decided that it would be best to use the specialty CFL delta watts mapping from the residential portion of the TRM for the BILD program. Using the bulb type specific mapping from the residential section increases the baseline wattage for some lamps and decreases it for others. Overall, this change has a small impact on PY6 results but is a more grounded approach. However, this change will be much more critical in PY7, when EISA standards take effect for 60 watt and 40 watt lamps. If the lumen mapping for commercial specialty CFLs from the v2.0 or v3.0 TRM were used in PY7, the evaluation team estimates an approximately 30% reduction in gross savings for this lamp category.

The larger differences observed in delta watts for the LED categories is a result of shifting the previously mentioned trim kits from the "bulb" to the "fixture" category (again, this has no impact on overall savings). The QC process also resulted in minor changes in wattage and lumen output for select LED models. Overall, the changes from the QC process result in a 1% increase in savings. Additionally, there were 164 unique LED and CFL models for which the IL TRM v2 was incorrectly applied for ComEd reported savings (the majority of these cases applied a lumen mapping from a different bulb type). The discrepancies for these models were also minor and resulted in a decrease in savings of approximately 1%.

3.3.3 Installation Rates

The Ex Ante planning parameters received by the evaluation team specified a 69.5% installation rate for all bulb types. As laid out in the IL TRM (v2.0), the Verified Savings first-year installation rates are assumed to be 69.5% for CFLs and linear fluorescent lamps and 100% for LED bulbs and fixtures. There is no guidance in the IL TRM for HID lamps, but given their high cost, it is reasonable to assume their installation rate would be similar to that of LEDs and so it was set at 100%. For bulbs installed in residential locations, the residential installation rates from the IL TRM v2.0 were used. These installation

rates are the same as the deemed installation rates except for specialty CFLs (79.5%) and LED lamps and fixtures (95%).

3.3.4 Residential/Non-residential Installation Location Split

There were no residential installations for BILD products assumed for Ex Ante estimates. The values used for the Verified Savings Res/Non-Res split were derived from the IL TRM v3.0 as the deemed split in IL TRM v2.0 is not appropriate. In v2.0, the Res/Non-Res split is deemed at 96%/4% "based on a weighted (by sales volume) average of ComEd PY3 and PY4 and Ameren PY5 in-store intercept survey results." This is an error because these values were based on residential retail program data and are not applicable to midstream commercial programs. For the IL TRM v3.0, the recommendation was to use a three year rolling average based on evaluation research findings. As there are only two years of evaluation research data available for this parameter, there is a weighted average Res/Non-Res split value of 3%/97% for bulbs and 1%/99% for fixtures (based on the two years of available data). The v2.0 values were never updated, so there is currently no "correct" deemed Res/Non-Res split in v2.0. Because of this, the v3.0 TRM values based on PY4 and PY5 data are used for the Verified Savings Res/Non-Res split.

3.3.5 Residential Hours of Use, Peak Coincidence Factor and Interactive Effects

There were no residential installations for BILD products assumed in Ex Ante estimates. The Verified Savings residential HOU for standard CFLs is from the IL TRM v2.0 for residential and in-unit multi-family installations. For specialty CFLs, the residential HOU is based on the IL TRM v2.0 values weighted by specialty bulb type. For LED bulbs, the only guidance in the IL TRM for residential applications is for LED down lights. Thus, the down light HOU value was used for reflector lamps and the HOU for the remainder of LED lamp types were weighted by standard and specialty CFL HOU for residential applications. LED fixtures, linear fluorescents, ballasts, and HID lamps were all assumed to have the same HOU as residential LED down lights. The peak CF, IEe, and IEd parameters for Verified Savings were weighted in the same manner as HOU.

3.3.6 Non-Residential Hours of Use, Peak Coincidence Factor and Interactive Effects

Ex Ante values for non-residential HOU for standard and specialty CFLs and LED bulbs are based on the IL TRM v2.0 for non-residential installations of screw-based bulbs in the "miscellaneous" business type. Similarly, LED fixtures, HID bulbs, and linear fluorescent lamps and ballasts all use HOU for "miscellaneous" fixtures. For Verified Savings non-residential HOU, the HOU values for bulbs and fixtures were weighted by the number of units sold to each business type as designated in the TRM.[31] The peak CF, IEe, and IEd parameters for Verified Savings were weighted in the same manner as HOU.

The business type and unit sales weighted averages for these parameters differ somewhat from the "miscellaneous" category values in the TRM. For instance, the business type weighted average HOU for non-residential CFLs and LED bulbs from Table 3-5 is 3,454, which is 8% higher than the miscellaneous HOU estimate of 3,198 found in the TRM. The business type weighted average HOU for LED fixtures, linear fluorescent lamps and ballasts, and HID lamps is 4,588, which is less than 1% higher than the

[31] Where possible, business type was extracted from the business name in the tracking data. Business type data was also gathered from each end-user surveyed in the PY6 evaluation.

miscellaneous HOU estimate of 4,576 in the TRM. For program planning purposes, it is useful to know how the business type distribution of BILD program participants compares to the distribution of business types assumed to derive the "miscellaneous" estimate in the TRM. Future evaluation efforts will examine whether or not the distribution of BILD participants business type is consistent enough over time that it could be used to help ComEd adjust their ex ante savings estimates for planning purposes.

3.4 Verified Gross Program Impact Results

The resulting total program verified gross savings is 265,158 MWh, 62 MW, and 54 Peak MW as shown in the following tables (Table 3-6, Table 3-7, and Table 3-8). The tables present savings for each product type and distinguish between the retail and distributor channels as well as residential and non-residential installations. These saving estimates are based on deemed parameter estimates from the TRM v2.0. The evaluation team verified the quantity of bulbs sold based on the tracking data and found they matched 100% with the ex ante estimates. The Installed Savings Realization Rates shown in the tables below are calculated as the deemed installation rate times the deemed Interactive Effects estimates for each bulb type and installation location (residential and non-residential). The values in the table are the weighted average across all bulb types and installation locations. They do not represent the proportion of Ex Ante savings found within the Verified Savings analysis.

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

	Retail Program	Distributor Program	Total
Residential Verified Gross MWh Savings			
Standard CFLs	310	439	749
Specialty CFLs	0	817	817
LED Bulbs	495	1,672	2,167
LED Fixtures	21	29	50
Linear Fluorescent Lamps	0	29	29
HID Lamps	0	2	2
Linear Fluorescent Ballasts	0	2	2
Total Residential Verified Gross MWh Savings	826	2,990	3,816
Installed Savings Gross MWh Realization Rate[32]	87%	89%	88%
Non-Residential Verified Gross MWh Savings			
Standard CFLs	17,865	25,309	43,174
Specialty CFLs	8	43,073	43,080
LED Bulbs	29,499	99,563	129,062
LED Fixtures	11,856	16,451	28,307
Linear Fluorescent Lamps	10	15,601	15,612
HID Lamps	0	922	922
Linear Fluorescent Ballasts	0	1,185	1,185
Total Non-Residential Verified Gross MWh Savings	59,238	202,104	261,342
Installed Savings Gross MWh Realization Rate	110%	105%	106%
Total Verified Gross MWh Savings			
Standard CFLs	18,175	25,748	43,923
Specialty CFLs	8	43,889	43,897
LED Bulbs	29,994	101,235	131,229
LED Fixtures	11,877	16,480	28,357
Linear Fluorescent Lamps	10	15,630	15,641
HID Lamps	0	924	924
Linear Fluorescent Ballasts	0	1,187	1,187
Total Verified Gross MWh Savings	60,064	205,094	265,158
Installed Savings Gross MWh Realization Rate	109%	105%	106%

Source: Evaluation Team analysis.

[32] The Installed Savings Realization Rates shown in the tables are calculated as the installation rate times the Interactive Effects estimate. They do not represent the proportion of Ex Ante savings found within the Verified Savings analysis.

Table 3-7. PY6 Verified Gross Impact Savings Estimates by Measure Type - MW

	Retail Program	Distributor Program	Total
Residential Verified Gross MW Savings			
Standard CFLs	0.3	0.4	0.8
Specialty CFLs	0.0	0.8	0.8
LED Bulbs	0.5	1.7	2.2
LED Fixtures	0.0	0.0	0.0
Linear Fluorescent Lamps	0.0	0.0	0.0
HID Lamps	0.0	0.0	0.0
Linear Fluorescent Ballasts	0.0	0.0	0.0
Total Residential Verified Gross MW Savings	0.8	3.0	3.8
Installed Savings Gross MW Realization Rate[33]	87%	85%	85%
Non-Residential Verified Gross MW Savings			
Standard CFLs	4.2	6.0	10.2
Specialty CFLs	0.0	9.8	9.8
LED Bulbs	6.9	23.2	30.1
LED Fixtures	2.1	2.9	5.0
Linear Fluorescent Lamps	0.0	2.7	2.7
HID Lamps	0.0	0.2	0.2
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Non-Residential Verified Gross MW Savings	13.2	45.0	58.2
Installed Savings Gross MW Realization Rate	88%	85%	85%
Total Verified Gross MW Savings			
Standard CFLs	4.5	6.4	11.0
Specialty CFLs	0.0	10.6	10.6
LED Bulbs	7.4	24.9	32.2
LED Fixtures	2.1	2.9	5.0
Linear Fluorescent Lamps	0.0	2.8	2.8
HID Lamps	0.0	0.2	0.2
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Verified Gross MW Savings	14.0	48.0	62.0
Installed Savings Gross MW Realization Rate	87%	85%	85%

Source: Evaluation Team analysis.

[33] The Installed Savings Realization Rates shown in the tables are calculated as the installation rate times the Interactive Effects estimate. They do not represent the proportion of Ex Ante savings found within the Verified Savings analysis.

Table 3-8. PY6 Verified Gross Impact Savings Estimates by Measure Type - Peak MW

	Retail Program	Distributor Program	Total
Residential Verified Gross Peak MW Savings			
Standard CFLs	0.0	0.0	0.1
Specialty CFLs	0.0	0.1	0.1
LED Bulbs	0.1	0.2	0.2
LED Fixtures	0.0	0.0	0.0
Linear Fluorescent Lamps	0.0	0.0	0.0
HID Lamps	0.0	0.0	0.0
Linear Fluorescent Ballasts	0.0	0.0	0.0
Total Residential Verified Gross Peak MW Savings	0.1	0.3	0.4
Installed Savings Gross Peak MW Realization Rate	89%	92%	91%
Non-Residential Verified Gross Peak MW Savings			
Standard CFLs	4.0	5.7	9.8
Specialty CFLs	0.0	8.6	8.6
LED Bulbs	6.3	21.3	27.6
LED Fixtures	1.9	2.7	4.6
Linear Fluorescent Lamps	0.0	2.6	2.6
HID Lamps	0.0	0.2	0.2
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Non-Residential Verified Gross Peak MW Savings	12.3	41.3	53.6
Installed Savings Gross Peak MW Realization Rate	126%	121%	122%
Total Verified Gross Peak MW Savings			
Standard CFLs	4.1	5.8	9.9
Specialty CFLs	0.0	8.7	8.7
LED Bulbs	6.3	21.4	27.8
LED Fixtures	1.9	2.7	4.7
Linear Fluorescent Lamps	0.0	2.6	2.6
HID Lamps	0.0	0.2	0.2
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Verified Gross Peak MW Savings	12.4	41.6	54.0
Installed Savings Gross Peak MW Realization Rate	125%	121%	122%

Source: Evaluation Team analysis.

The BILD Program is able to claim energy and demand savings from program bulbs purchased during PY4 and PY5 but not installed (i.e., used by the consumer) until the current program year. Table 3-9 provides estimates of the Verified Gross savings resulting from these carryover bulbs.

Table 3-9. PY6 Verified Gross Impact Savings from PY4 and PY5 Carryover Bulbs

	PY4 Program Bulbs	PY5 Program Bulbs	Total
Verified Gross MWh Savings	12,411	15,708	28,119
Verified Gross MW Savings	2.9	3.3	6.2
Verified Gross Peak MW Savings	2.6	2.9	5.5

Source: Evaluation Team analysis.

4 Net Impact Evaluation

Verified net energy and demand (coincident peak and overall) savings were calculated by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). The NTGR estimates applied to calculate verified net savings were 0.63 for all measure types in the BILD program. SAG determined[34] that the NTGR values for this program should be deemed prospectively and used to calculate verified net savings. Table 4-1, Table 4-2 , and Table 4-3 show the PY6 verified net energy, demand, and peak demand savings.

[34] Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

Table 4-1. PY6 Verified Net Impact Savings Estimates by Measure Type – MWh

	Retail Program	Distributor Program	Total
Residential Verified Net MWh Savings			
Standard CFLs	195	276	472
Specialty CFLs	0	515	515
LED Bulbs	312	1,053	1,366
LED Fixtures	13	18	32
Linear Fluorescent Lamps	0	18	18
HID Lamps	0	1	1
Linear Fluorescent Ballasts	0	1	1
Total Residential Verified Net MWh Savings	521	1,884	2,404
Non-Residential Verified Net MWh Savings			
Standard CFLs	11,255	15,945	27,200
Specialty CFLs	5	27,136	27,140
LED Bulbs	18,584	62,724	81,309
LED Fixtures	7,469	10,364	17,833
Linear Fluorescent Lamps	6	9,829	9,835
HID Lamps	0	581	581
Linear Fluorescent Ballasts	0	747	747
Total Non-Residential Verified Net MWh Savings	37,320	127,326	164,645
Total Verified Net MWh Savings			
Standard CFLs	11,450	16,221	27,671
Specialty CFLs	5	27,650	27,655
LED Bulbs	18,896	63,778	82,674
LED Fixtures	7,482	10,382	17,865
Linear Fluorescent Lamps	6	9,847	9,854
HID Lamps	0	582	582
Linear Fluorescent Ballasts	0	748	748
Total Verified Net MWh Savings	37,840	129,209	167,049

Source: Evaluation Team analysis.

Table 4-2. PY6 Verified Net Impact Savings Estimates by Measure Type – MW

	Retail Program	Distributor Program	Total
Residential Verified Net MW Savings			
Standard CFLs	0.2	0.3	0.5
Specialty CFLs	0.0	0.5	0.5
LED Bulbs	0.3	1.0	1.4
LED Fixtures	0.0	0.0	0.0
Linear Fluorescent Lamps	0.0	0.0	0.0
HID Lamps	0.0	0.0	0.0
Linear Fluorescent Ballasts	0.0	0.0	0.0
Total Residential Verified Net MW Savings	0.5	1.9	2.4
Non-Residential Verified Net MW Savings			
Standard CFLs	2.7	3.8	6.4
Specialty CFLs	0.0	6.2	6.2
LED Bulbs	4.3	14.6	19.0
LED Fixtures	1.3	1.8	3.1
Linear Fluorescent Lamps	0.0	1.7	1.7
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.1	0.1
Total Non-Residential Verified Net MW Savings	8.3	28.3	36.7
Total Verified Net MW Savings			
Standard CFLs	2.9	4.0	6.9
Specialty CFLs	0.0	6.7	6.7
LED Bulbs	4.6	15.7	20.3
LED Fixtures	1.3	1.8	3.2
Linear Fluorescent Lamps	0.0	1.7	1.7
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.1	0.1
Total Verified Net MW Savings	8.8	30.2	39.1

Source: Evaluation Team analysis.

Table 4-3. PY6 Verified Net Impact Savings Estimates by Measure Type - Peak MW

	Retail Program	Distributor Program	Total
Residential Verified Net Peak MW Savings			
Standard CFLs	0.0	0.0	0.0
Specialty CFLs	0.0	0.0	0.0
LED Bulbs	0.0	0.1	0.1
LED Fixtures	0.0	0.0	0.0
Linear Fluorescent Lamps	0.0	0.0	0.0
HID Lamps	0.0	0.0	0.0
Linear Fluorescent Ballasts	0.0	0.0	0.0
Total Residential Verified Net Peak MW Savings	0.1	0.2	0.2
Non-Residential Verified Net Peak MW Savings			
Standard CFLs	2.5	3.6	6.2
Specialty CFLs	0.0	5.4	5.4
LED Bulbs	4.0	13.4	17.4
LED Fixtures	1.2	1.7	2.9
Linear Fluorescent Lamps	0.0	1.6	1.6
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.1	0.1
Total Non-Residential Verified Net Peak MW Savings	7.7	26.0	33.8
Total Verified Net Peak MW Savings			
Standard CFLs	2.6	3.6	6.2
Specialty CFLs	0.0	5.5	5.5
LED Bulbs	4.0	13.5	17.5
LED Fixtures	1.2	1.7	2.9
Linear Fluorescent Lamps	0.0	1.6	1.6
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.1	0.1
Total Verified Net Peak MW Savings	7.8	26.2	34.0

Source: Evaluation Team analysis.

Table 4-4 provides estimates of the Verified Net savings resulting from PY4 and PY5 carryover bulbs installed in PY6.

Table 4-4. PY6 Verified Net Impact Savings from PY4 and PY5 Carryover Bulbs

	PY4 Program Bulbs	PY5 Program Bulbs	Total
Verified Net MWh Savings	7,768	9,831	17,599
Verified Net MW Savings	1.8	2.1	3.9
Verified Net Peak MW Savings	1.6	1.8	3.5

Source: Evaluation Team analysis.

4.1 PY7 Carryover Savings Estimate

Calculation of the PY7 carryover estimate relies upon the IL TRM (v 2.0 and 3.0) and the PY5 and PY6 reports. At this time all of these data sources are available and thus it is possible to estimate the gross and net carryover energy savings that the evaluation team recommends for PY7. The energy and demand savings from these PY5 and PY6 late installed bulbs are calculated based on the following parameters:

- Delta Watts – Verified Savings estimate from the year of installation (source: IL TRM v3.0)
- Res/Non-Res Split - Evaluation Research from the year of purchase (PY5 and PY6 Reports)
- HOU and Peak CF – Verified Savings estimate from the year of installation (source: IL TRM v3.0)
- Energy and Demand IE – Verified Savings estimate from the year of installation (source: IL TRM v3.0)
- Installation Rate - Verified Savings estimate from the year of purchase (source: IL TRM v1.0 and IL TRM v2.0)
- NTGR – Evaluation Research from the year of purchase (source: PY5 and PY6 Reports)

Table 4-5 shows that in PY7 365,891 bulbs, purchased during either PY5 or PY6, are expected to be installed within ComEd service territory. The table provides both the gross and net energy and demand savings from these bulbs. The total net energy savings is estimated to be 18,013 MWh and 3.7 Peak MW, which will be counted in PY7 as BILD Lighting Program Carryover savings. While the volume of carryover bulbs believed to be installed in PY7 is more than 50%larger than the volume of carryover bulbs installed in PY6, the estimated carryover savings for PY7 is nearly identical to the PY6 carryover savings due to the reduction in delta watts that has occurred as a result of the 40- and 60-watt EISA standards becoming effective in PY7.

Table 4-5. PY7 Verified Savings Carryover Estimate

PY7 Verified Savings Carryover Estimate	PY5 Bulbs	PY6 Bulbs	PY7 Carryover
Carryover Bulbs Installed in PY7	128,248	237,643	365,891
Average Delta Watts	18.0	17.1	n/a
Average Daily Hours of Use	10.7	10.9	n/a
Peak Load Coincidence Factor	0.63	0.64	n/a
Gross kWh Impact per unit	62.1	59.4	n/a
Gross kW Impact per unit	0.02	0.02	n/a
Installation Rate	100%	100%	n/a
Energy Interactive Effects	1.23	1.24	n/a
Demand Interactive Effects	1.36	1.37	n/a
Carryover Gross MWh Savings	9,831	17,577	27,408
Carryover Gross MW Savings	2.3	4.1	6.4
Carryover Gross Peak MW Savings	2.0	3.6	5.6
Net-to-Gross Ratio	0.64	0.67	0.66*
Carryover Net MWh Savings	6,256	11,757	18,013
Carryover Net MW Savings	1.5	2.7	4.2
Carryover Net Peak MW Savings	1.3	2.4	3.7

Source: Evaluation Team analysis.

* This value is a weighted average of the NTG ratios from PY5 and PY6.

5 Process Evaluation

The process portion of the PY6 BILD Program Evaluation assessed the impact of program processes (e.g., the mechanics of how the program was implemented) on consumers and lighting distributors who participated in the program. For these program players, we examined the reach of program marketing, purchasing decisions, awareness of bulb types, federal regulatory changes, program discounts, and barriers to purchasing efficient lighting. The primary data sources for the process evaluation were the end-user surveys (n=282), and the distributor surveys (n=51). Complete process evaluation results are presented in Appendix Section 7.2. The following paragraphs summarize the key process findings from the study:

Our evaluation finds that cost and lack of awareness of the options prevent some end-users from purchasing reduced wattage linear fluorescents. Just over one-quarter of end-users surveyed (27%) reported purchasing standard efficiency linear fluorescent bulbs for use in their business since June of 2013. When asked why they did not purchase reduced wattage fluorescents instead, approximately one-quarter (24%) said the cost of reduced wattage linear fluorescents or a lack of familiarity with reduced wattage linear fluorescent bulbs (23%) was a was a significant reason for why they purchased standard efficiency bulbs. When we asked distributors a similar question about the primary reasons customers provide for not purchasing reduced wattage linear fluorescent, close to two-thirds (64%) said cost is a barrier while just over half said lack of familiarity with the bulbs (52%).

Just over two thirds (69%) of the distributors that sell reduced wattage linear fluorescents said that customers are not aware that the incremental cost of reduced wattage linear fluorescents is typically small and mostly offset by the ComEd incentive and that the payback period is also short (typically less than one year). Additionally, the end-user survey indicates that there might be missed opportunities for distributors to more consistently explain the benefits of reduced wattage linear fluorescents. Just under three fifths (9 of the 16) respondents who said the cost of reduced wattage linear fluorescents was a significant reason for why they purchased standard efficiency bulbs rather than the reduced wattage equivalent also said that a salesperson discussed advantages of efficient linear fluorescent lamps that may compensate for the small incremental cost over standard efficiency equivalents.

Additionally, while 88% of end-users purchasing linear fluorescents report being “somewhat familiar” or “very familiar” with reduced wattage linear fluorescents before their purchase, survey results and distributor interviews indicate that many end-users report being aware of the reduced wattage options but seem misinformed on actual product performance. ComEd goes to great effort to develop marketing materials and to train program distributors, but only 55% of distributors report receiving marketing materials and only 75% of those report using the materials. This indicates that only about 40% of distributors are using the provided materials.

While the program has had great success at promoting these products, the results presented above suggest there is room for improvement. The program may want to consider talking more with distributors one on one during their visits to find out if distributors feel the program could provide anything that would help educate end-users on the minor incremental cost and short payback period associated with reduced wattage linear fluorescents purchased with the program discount.

For LEDs, end users consistently reported that the bulbs were too expensive (43%) and that the desired LED lamp types were unavailable (23%). Distributors overwhelmingly cite high cost as the primary reason their customers provide for not purchasing LEDs (96%). Fortunately, the cost barrier is already decreasing due to improvements in technology and increasing market production. There is still room, however, for distributors to emphasize the lifetime savings from LEDs (factoring in lower energy use, long lifetimes, incandescent replacement costs, and decreased O&M) and to help customers identify the appropriate LED for their fixture and particular need. Additionally, our evaluation found that customers who purchase LEDs are more likely to rely on a salesperson recommendation than those who purchased CFLs (16% compared to 5%). These results suggest that sales reps play a larger role in getting end-users to try new products such as LEDs that cost more than their usual purchase.

Lack of awareness of LEDs is becoming less of a barrier to purchase too. Only 11% of end-users said they purchased incandescents instead of LEDs because they were not familiar with the bulbs. In addition, when we asked customers who did not purchase LEDs through the BILD program if they were aware of the bulbs, only 7% said they were not. This represents a significant decrease in lack of awareness over PY5 (20% were not aware in PY5).

6 Findings and Recommendations

The PY6 goal of the BILD Distributor Program was to achieve 100 GWh of gross energy savings. The PY6 Gross Verified Energy Savings from the Distributor Program were estimated to be 205,094 MWh, more than twice the program goal. An additional 60,064 MWh from the Retail portion of the program put total Gross Verified Energy Savings from the BILD Program at 265,158 MWh. Thirty-three percent of these savings were from CFLs, 60% from LEDs, 6% from linear fluorescents, and 1% from linear fluorescent ballasts and HID lamps.

Midstream Program Evaluation

Finding 1. Incentive programs delivered through the midstream channel have many advantages. Unfortunately, this delivery mechanism makes obtaining information critical to program evaluation from end-users more challenging. In order to achieve a statistically representative sample, the evaluation team estimated that 500 end-user survey completes would be necessary. Given the approximate 10% end-user survey completion rate experienced by the evaluation team, it would have been necessary to obtain contact information for every program participant. While it is a requirement for all distributors provide detailed customer information for all program sales on request, this process is cumbersome, labor intensive, expensive, and inexact.

Recommendation 1. As some form of this recommendation has appeared in the past three evaluation reports, the evaluation team recommends a meeting between the ComEd BILD Program Managers, the BILD Program Implementers, and select BILD Program Distributors in advance of PY8 to discuss data collection options. One possibility would be to switch to a web survey format closer to the time of purchase. This approach was successful for the distributor web surveys implemented in the current evaluation but capturing email addresses would still be a challenge in a midstream program.

Program Tracking Data

Finding 2. The fields in the tracking data were not consistent between the retail and distributor portions of the BILD program. For the distributor program, the total number of bulbs is equal to the sum of the "Quantity" field and for the retail program, the total number of bulbs is equal to the sum of the "Quantity" field times the "Pack_Size" field.

Recommendation 2. The fields in the tracking data should be made consistent between the two segments of the program (Distributor vs. Retail). Additionally, the field names should be made very explicit (e.g. "# of Packages," "Units per Pack," "Total Unit Quantity") to ensure they are used appropriately.

Finding 3. The bulb information database contained exact matches for all model numbers in the tracking data. However, for a number of products, there were multiple entries for the same bulb model number that had conflicting information. This led to incorrect baseline or measure wattages being assigned initially. It was determined that these multiple records were due to outdated entries in the database (i.e., from prior program years). In the process of identifying these duplicate entries, a quality control assessment of the information in the bulb information database was conducted which identified a number of additional model numbers with incorrect bulb information (wattage, lumens, or bulb type).

Recommendation 3a. A field should be added to the EFI_BIZ_LTG_LKUP table that specifies the program year. This would ensure the most up-to-date bulb information is appended to the tracking data.[35]

Recommendation 3b. Due to the number of program bulbs models (~1,800 in PY6), it is not feasible to perform individual manufacturer specification sheet lookups to verify bulb information (wattage, lumens, bulb type). The current bulb information database for CFLs is based first on information in the ENERGY STAR qualified products list and backfilled using manufacturer specification sheets. For LEDs, the performance data were supplied by either the manufacturer or the participating distributors. The evaluation team agrees these are the best methods for establishing product characteristics. However, due to the number of discrepancies observed in the internal QC process, it is recommended that the top ~50 models with the highest sales volume be subjected to manufacturer specification sheet verification in each program year during the evaluation process.

Recommendation 3c. While the BILD lighting lookup table was updated in PY5 to include lamp type (standard, specialty, directional, decorative, etc.), there are no fields for specialty bulb type (candelabra, globe, etc.), dimmable/non-dimmable, or reflector bulb type. To accurately determine delta watts using the evaluation recommended lumen mapping, the lookup table should include specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.). Because the IL TRM v3.0 requires a lumen mapping by specific bulb type for some product categories, it would be beneficial to include these descriptions in the bulb information database.

Verified Gross Impacts and Installed Savings Realization Rate[36]

Finding 4. The PY6 Gross Verified Energy Savings were estimated to 265,158 MWh of which 23% was attributable to the Retail Program and 77% was attributable to the Distributor Program. The Installed Savings Realization Rate on this savings estimate is 106%. This Realization Rate is primarily driven by the high 1st year installation rate for LEDs, which was 100% for both LED lamps and fixtures. Also contributing to the high Installed Savings Realization Rate was the high energy interactive effects for non-residential installations.[37]

Verified Savings and Evaluation Research HOU

Finding 5. The business type and unit sales weighted averages for HOU differ somewhat from the "miscellaneous" category values in the TRM. The weighted average HOU for non-residential CFLs and LED is 8% higher than the miscellaneous estimate of 3,198. The weighted average HOU for LED fixtures, linear fluorescent lamps and ballasts, and HID lamps is 4,588, which is less than 1% higher than the miscellaneous value of 4,576.

Recommendation 5. For program planning purposes, it is useful to know how actual business type distributions in the BILD program compare to the "miscellaneous" assumptions in the TRM. It is

[35] This recommendation has already been conveyed to ComEd, and the database is being updated accordingly.

[36] The Verified Gross Installed Savings Realization Rate adjusts the Unadjusted Gross savings estimates to account for the 1st year installation rate and any interactive effects associated with the measure. It is different from them Ex Ante realization rate which is the ratio of the ex post verified savings estimate over the ex ante savings estimate.

[37] Energy interactive effects reflect a reduction in a building's cooling load due to the reduction in heat given off by incandescent bulbs.

recommended that future evaluation efforts examine business type distribution over time to help ComEd adjust their ex ante savings estimates accordingly.

Evaluation Research Gross Impacts and Realization Rate

Finding 6. The Evaluation Research Gross Realization Rate[38] across all bulb types was 94%. As compared to Verified Savings, Evaluation Research savings are lower due to a number of factors. The largest drivers of the decreased Evaluation Research savings estimates were reductions in LED specific Evaluation Research parameters. There was a 3% reduction in the installation rate for LEDs (from 100% to 97%), and 13% reduction in average delta watts for LEDs. The lower delta watts value results from switching from the currently one-size fits all lumen mapping for directional LEDs in IL TRM v2.0 to the bulb shape specific mapping used to estimate the Evaluation Research results. The bulb shape specific mapping is also what is included in the IL TRM v3.0.

Recommendation 6. The large decrease in delta watts for LEDs is worth exploring through further research given their expanding influence in the program. Although the Evaluation Research lumen equivalencies are grounded in the federal standards for incandescent lamps, initial review of LED manufacturer product specifications indicates that the reported incandescent equivalencies do not always align with the Federal lumen requirements of a similar incandescent lamp. ComEd and the evaluation team should work together to determine the appropriate scope of additional research into this topic, potentially including bench testing and manufacturer interviews.

Peak Demand Reduction.

Finding 7. The PY6 Gross Verified Savings (ex post) Peak Demand reduction was found to be 54.0 MW and the Net Verified Savings (ex post) Peak Demand reduction was found to be 34.0 MW. The PY6 Net Peak Demand reduction level was 67% larger than the PY5 estimate (20.3 MW). The largest portion of this increase is due to the continued and dramatic growth of LED sales through the program, which comprised 60% of Verified Net Peak Demand Savings.

Evaluation Research Net Impacts

Finding 8. The Net-to-Gross Ratios (NTGR) found in the PY6 evaluation are 0.68 for CFLs, 0.77 for LEDs and 0.61 for linear fluorescent lamps. These NTGRs are 3%, 10%, and 9% higher, respectively, than the PY5 Evaluation Research findings. Compared to the PY6 program-wide deemed NTGR (0.63),[39] the PY6 Evaluation Research results are 22% higher for LEDs, 8% higher for CFLs, and 3% lower for linear fluorescent lamps. The observed variability in NTGR lends further support to the PY5 recommendation to update the deemed NTGR estimates based on a bulb-weighted rolling 3-year NTGR rolling average of Evaluation Research results. This rolling average provides consistency from year-to-year and ensures that the NTGR results from any

[38] The Evaluation Research Gross Realization Rate is equal to the Evaluation Research Gross Savings estimate / Verified Gross Savings estimate.

[39] Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html

single year do not drastically alter the resulting net savings. It should be noted that if a significant changes are made to the BILD Lighting Program that would render the 3-year rolling average NTGR inappropriate, and would justifiably warrant a revised NTGR estimate away from the 3-year rolling average, this should be considered.

Barriers to Reduced-Wattage Linear Fluorescent Adoption.

Finding 9. Our evaluation finds that cost and lack of familiarity with reduced wattage lamps prevent some end-users from purchasing reduced wattage linear fluorescents. For end users, approximately one-quarter (24%) cited cost and another quarter (23%) cited lack of familiarity with reduced wattage linear fluorescent bulbs as significant reasons for why they purchased standard efficiency bulbs. Close to two-thirds (64%) of distributors said cost is a barrier for their customers while just over half said customers lack familiarity with the bulbs (52%). Just over two thirds (69%) of the distributors that sell reduced wattage linear fluorescent said that customers are not aware that the incremental cost of reduced wattage linear fluorescent is typically small and mostly offset by the ComEd incentive and that the payback period is also small. However, only three fifths (9 of the 16) of end users who said the cost was a barrier indicated that a salesperson discussed advantages of efficient linear fluorescent lamps that may compensate for the small incremental cost over standard efficiency equivalents.

Additionally, while 88% of end-users purchasing linear fluorescents report being "somewhat familiar" or "very familiar" with reduced wattage linear fluorescents before their purchase, survey results and distributor interviews indicate that many end-users report being aware of the reduced wattage options but seem misinformed on actual product performance. ComEd goes to great effort to develop marketing materials and to train program distributors, but only 55% of distributors report receiving marketing materials and only 75% of those report using the materials. This indicates that only about 40% of distributors are using the provided materials.

Recommendation 9. The program should consider talking more with distributors one on one during their visits to find out if the program could provide additional materials that would help educate end-users on the minor incremental cost and short payback period associated with reduced wattage linear fluorescents purchased with the program discount.

Barriers to LED Adoption.

Finding 10. The most common reasons for not purchasing LEDs were that the bulbs were too expensive (43%) and the inability to find the necessary bulb (23%). Distributors also cite high cost as the primary reason their customers provide for not purchasing LEDs (96%). Survey data collected in PY6 indicated that lack of awareness for LEDs is becoming less of a barrier to purchase. Eleven percent of end-users said they purchased incandescents instead of LEDs because they were not familiar with the bulbs. In addition, when we asked customers who did not purchase LEDs through the BILD program if they were aware of the bulbs, only 7% said they were not. This represents a significant increase in awareness over PY5 (20% of PY5 respondents were not aware). The evaluation found that customers who purchase LEDs are more likely to rely

on a recommendation than those who purchased CFLs (16% compared to 5%). These results suggest that sales reps play a larger role in getting end-users to try new products such as LEDs that cost more than their usual purchase.

Recommendation 10. As LED prices continue to drop, the cost barrier should begin to decrease. In addition, the program could encourage distributors to emphasize the relatively short payback period as compared to lifetime savings from LEDs and encourage them to help customers identify the appropriate LED for their particular needs.

TRM Updates

Finding 11. The commercial section of the v2.0 TRM for CFLs does not designate between standard and specialty lamp types. There is only one lumen mapping for delta watts for all CFL lamp types. Because of that, the EISA regulations for omni-directional lamps are being applied to all CFL lamp types, including exempt bulbs. This has the effect of reducing the deemed baseline wattage for certain specialty lamps (especially reflectors). The residential section of the TRM does include a separate mapping for specialty CFL lamps that is in line with EISA (for omni-directional lamps) and EPACT (for directional lamps) and is a more technically accurate method of establishing baseline wattage for these EISA exempt bulb types. Using this method for PY6 Evaluation Research had a small impact on PY6 results but is a more grounded approach. However, this change will be much more critical in PY7, when EISA standards take effect for 60 watt and 40 watt lamps. If the lumen mapping for commercial specialty CFLs from the v2.0 or v3.0 TRM were used in PY7, the evaluation team estimates an approximately 30% reduction in gross savings for this lamp category.

Recommendation 11. The evaluation team recommends the TRM be updated with the bulb type specific mapping currently included in the Residential section of the TRM and will provide this recommendation to the TAC.

7 Appendix

7.1 Evaluation Research Impact Approaches and Findings

7.1.1 Primary Data Collection

In addition to the tracking system review described in Section 3.1, the evaluation team collected primary data from a variety of sources to inform evaluation research activities.

7.1.1.1 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 BILD Program Manager and one with the DNV GL Implementation Manager. These interviews were completed over the telephone in February and April of 2014. Both interviews focused on the any programmatic changes that went into effect in PY6 and the impact these changes had on program participation and impacts. The interview guides used are included in Appendix 7.6.

7.1.1.2 Program Distributor Web Surveys

The evaluation team developed a web survey which was sent to all participating BILD program distributors. These surveys 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 the NTGR based on a supplier self-report method. 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 51 participating distributors completed surveys, most of whom were able to provide data used to calculate a supplier self-reported NTGR estimate. These distributors collectively sold 49% of all CFLs, 35% of all LEDs, and 61% of all linear fluorescent lamps sold through the program in PY6. Table 7-1 shows the disposition of the distributor web survey.

Table 7-1. Distributor Web Survey Disposition

Web Survey Disposition	Distributor Survey	%
Sample Pulled	82	100%
Completed Surveys	51	62%
Invalid E-mail	3	4%
Partial Completes	7	9%
No Response	21	26%

7.1.1.3 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 PY6 BILD 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 July 20 and August 25, 2014. The original goal was to conduct a total of 500 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 was a cumbersome, labor intensive, expensive, and inexact process. In spite of this, the team was able to assemble contact information for 2,982 unique end users (of approximately 5,500 BILD program customers). Of these 2,982 end users, 282 completed phone surveys. Based on this completion rate (<10%), contact information for all program end users would have been necessary to meet the target of 500 completes. This finding lends strong support to the evaluation team's request to receive contact information for ALL BILD end-users.

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

<u>Survey Disposition</u>

Table 7-2 shows the final disposition resulting from calling 2,982 ComEd commercial customers who purchased program discounted BILD program bulbs through a program distributor. 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, 282 surveys were completed in PY6.

Table 7-2. End-user Survey Call Disposition

Call Disposition	End-user Survey	%
Sample Pulled	2,982	100%
Completed Surveys	282	9%
Partial Completes	29	1%
Refusal	824	28%
No answer/answering machine/busy/call back, unable to complete	1264	42%
Disconnected/wrong number, blocked	88	3%
Not Eligible[40]	495	17%

Source: Navigant Evaluation Team Analysis of End-user Survey Data

[40] 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.

7.1.2 Evaluation Research Gross Parameter Estimates

Table 7-3 below contains the Evaluation Research Gross Savings parameter estimates that may differ by the retail and distributor channels (bulb sales and average delta watts). Table 7-4 contains the parameters that differ between residential and non-residential installation locations. These estimates differ slightly from the Verified Savings estimates in the following ways:

- Evaluation Research delta watts values differ from Verified Savings values for LED lamps and LED fixtures. For LED lamps and fixtures, delta watts differ because the IL TRM v2.0 uses a single lumen mapping for all directional lamps, regardless of lamp type. The Evaluation Research delta watts values are determined using the lamp type specific lumen mapping for directional lamps recommended in previous BILD program evaluations and taking effect in IL TRM v3.0.
- Evaluation Research estimated Res / Non-Res split was found to be 2% / 98% for lamps (CFLs and LEDs) and 0.2% / 99.8% for fixtures (applicable to LED fixtures, HID lamps, linear fluorescent lamps, and linear fluorescent ballasts). The deemed values for Res / Non-Res split are 7% / 93% for lamps and 1% / 99% for fixtures. The Evaluation Research Res / Non-Res split is based on bulb weighted end-user self-reported installations, collected during the PY6 end-user surveys, in multi-family living spaces.
- Evaluation Research estimated Installation rates were found to be 8% higher than the parameters included in the TRM. The Evaluation Research estimates for CFLs (standard and specialty bulbs combined), LEDs (bulbs only), and Linear Fluorescents were based on customer self-reports during the PY6 end-user telephone surveys. The installation rates for HID lamps were assumed to be the same as LED bulbs and fixtures, and the installation rates for linear fluorescent ballasts were assumed to be the same as linear fluorescent lamps.[41]

[41] Due to the low number of HID bulbs and linear fluorescent ballasts sold, it was not possible to conduct phone surveys with a reasonably large sample of end-users. While HID lamps and LED lamps are used for very different applications, they are both often used in niche applications where the installation rates may be similar. As HID lamps make up approximately 0.5% of program bulb sales, this assumption has little impact on the overall IR.

Table 7-3. Evaluation Research Gross Savings Parameters by Distribution Channel

Gross Impact Parameters	Bulb Type	PY6 Evaluation Research	
		Retail	Distributor
Program Sales	Standard CFLs	139,320	204,257
	Specialty CFLs	58	362,274
	LED Bulbs	148,514	554,202
	LED Fixtures	44,486	57,097
	Linear FL	870	840,033
	HID	0	2,607
	Ballasts	0	67,391
	All Bulbs	333,248	2,087,861
Delta Watts	Standard CFLs	46.8	45.3
	Specialty CFLs	46.0	41.9
	LED Bulbs	49.4	38.1
	LED Fixtures	39.5	45.1
	Linear FL	3.0	4.7
	HID	0.0	66.9
	Ballasts	0.0	4.5
	All Bulbs	46.9	25.2
Installation Rate	Standard CFLs		64%
	Specialty CFLs		64%
	LED Bulbs		97%
	LED Fixtures		97%
	Linear FL		99%
	HID		97%
	Ballasts		99%
	All Bulbs		83%
Leakage	All Bulbs		0.01%
Res/Non-Res	CFL and LED Bulbs		2% / 98%
	LF, LED Fixtures, HID		0.2% / 99.8%
Carryover Bulbs	PY4 and PY5 Sales		229,135

Source: Evaluation Team analysis.

Table 7-4. Evaluation Research Gross Savings Parameters by Install Location

Gross Impact Parameters	Bulb Type	PY6 Evaluation Research	
		Res	Non-Res
Hours of Use	Standard CFLs	938	3407
	Specialty CFLs	930	3499
	LED Bulbs	969	3454
	LED Fixtures	1,010	4568
	Linear FL	1,010	4591
	HID	1,010	4384
	Ballasts	1,010	4587
Peak CF	Standard CFLs	0.10	0.66
	Specialty CFLs	0.09	0.62
	LED Bulbs	0.10	0.64
	LED Fixtures	0.10	0.66
	Linear FL	0.10	0.68
	HID	0.10	0.67
	Ballasts	0.10	0.71
Interactive Effects	Standard CFLs	1.04 / 1.07	1.24 / 1.45
	Specialty CFLs	1.04 / 1.07	1.26 / 1.43
	LED Bulbs	1.04 / 1.07	1.24 / 1.44
	LED Fixtures	1.04 / 1.07	1.24 / 1.41
	Linear FL	1.04 / 1.07	1.24 / 1.40
	HID	1.04 / 1.07	1.22 / 1.45
	Ballasts	1.04 / 1.07	1.25 / 1.39

Source: Evaluation Team analysis.

The following sections describe in additional detail the parameters that differ between the Verified Savings analysis and the Evaluation Research analysis.

7.1.2.4 Residential/Non-residential Installation Location Split

The percentage of program bulbs being installed in residential versus non-residential locations in PY6 was estimated to be 2% / 98% for CFLs and LED bulbs and 0.2% / 99.8% for linear fluorescent lamps based on data collected during the end-user surveys. Respondents who indicated that they were planning to install their purchased program bulbs in a business that was reported to be an apartment building were asked a follow up question about whether the bulbs would be installed in a common area of the building or within an individual unit/room. Those respondents who reported that the program bulbs would be

installed within an individual unit/room were classified as residential installations and assigned residential HOU and CF estimates.

7.1.2.5 Installation Rate

The evaluation estimates of installation rate for CFLs, LEDs, and linear fluorescent lamps purchased as part of the PY6 BILD program were calculated based on data gathered during the end-user telephone surveys. The questions asked of respondents during the phone surveys included:

- What percentage of the (CFLs, LEDs, LFs) purchased through the program have been installed?
- Are all of these (CFLs, LEDs, LFs) still installed or have some been removed?
- What percentage of the installed (CFLs, LEDs, LFs) would you estimate have been removed?
- Why did you remove the (CFLs, LEDs, LFs)?
- Where are the (CFLs, LEDs, LFs) that have not been installed?

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). Table 7-5 below shows the installation rates based on the end-user surveys.

Table 7-5. End-user Survey Installation Rate

Population		Installation Rate	Lower 90% CI	Upper 90% CI	n Respondents	n Bulbs	N	N Bulbs
Overall Weighted[42]		88%	85%	91%	278	181,823	35,921	2,351,111
Bulb Type	CFL[43]	64%	55%	73%	81	16,999	11,946	705,909
	LED	97%	95%	100%	125	18,010	20,172	804,299
	Linear	99%	97%	101%	72	146,814	3,803	840,903
< 50	CFL	91%	84%	99%	40	722	9,880	136,944
	LED	96%	93%	100%	66	1,150	17,454	196,831
	Linear	93%	83%	103%	18	495	1,660	13,399
≥ 50	CFL	57%	44%	70%	41	16,277	2,066	568,965
	LED	97%	94%	101%	59	16,860	2,718	607,468
	Linear	99%	97%	101%	54	146,319	2,143	827,504

Source: PY6 End-user Surveys

[42] The weights applied to estimate the overall installation rate were based on total program bulb sales (CFLs, LEDs, and LFs) and were created in an effort to make the sample of respondent's surveys representative of the population of program bulbs sold.

[43] Because the installation rates for CFL transactions < 50 and >= 50 were statistically different based on the end-user surveys, the installation rate for CFLs was weighted by the overall number of CFLs sold in each of these buckets.

The survey results indicate an overall installation rate of 88%. When disaggregated by bulb type, linear fluorescents have the highest installation rate (99%), followed by LEDs (97%), and CFLs (64%). Respondents purchasing fewer than 50 CFL bulbs reported an average installation rate of 91%, whereas those purchasing 50 or more bulbs installed 57%, a statistically significant difference. Installation rates for respondents purchasing LEDs and linear fluorescents were not statistically different based on the quantity of bulbs purchased.

It is unsurprising that linear fluorescent lamps have the highest installation rate. First, there is no noticeable performance difference between a high efficiency and a standard efficiency linear fluorescent lamp, which results in a very low removal rate due to customer preference. Additionally, commercial and industrial facilities often have large numbers of linear fluorescent lamps installed. These lamps are usually replaced either through attrition or a total re-lamping. In the case of the latter, a very large portion of the purchased bulbs would be installed during the re-lamp. In the case of the former, facility managers are often familiar with the approximate number of bulbs that burn out in a given year and purchase bulbs accordingly. Because end-user surveys were conducted after the end of the PY6 program year, survey respondents would have had a chance to use the majority of the purchased stock.

7.1.2.6 Leakage

Based on the end-user telephone interviews conducted for the PY6 evaluation, leakage of program bulbs outside of ComEd territory appears to be a very small issue for the BILD program. Of the 282 respondents, only three indicated that some bulbs of the program bulbs they purchased were installed outside of the ComEd service territory. The estimated percentage of bulbs reported to have been installed outside of ComEd territory approximately 0.01% of the total bulbs purchased by survey respondents.

7.1.3 Evaluation Research Gross Impact Findings

The total PY6 BILD Program Evaluation Research Gross savings is estimated to be 250,077 MWh, 56 MW, and 51 Peak MW. Table 7-6 through Table 7-8 show Evaluation Research gross savings by Program and overall and present the Evaluation Research Gross Realization Rates[44] that are associated with these impact estimates. The Evaluation Research Gross Realization Rates for residential installations (22% for retail and 19% for distributor programs, Tables 7-6 to 7-8) are quite low because the fraction of residential installs in PY6 was found to be 2% for CFLs and LED lamps and 0.2% for all other product categories. This is a reduction from 7% and 1%, respectively, from the deemed parameters. While Residential Gross Realization Rates are low, the decrease in residential installations actually leads to an increase in savings due to higher hours of use and interactive effects in non-residential installations.

[44] The Evaluation Research Gross Realization Rates are equal to the Evaluation Research Gross Savings estimate / Verified Gross Savings estimate.

Table 7-6. Evaluation Research Gross MWh Savings Estimates by Measure Type

	Retail Program	Distributor Program	Total
Residential Evaluation Research Gross MWh Savings			
Standard CFLs	64	91	155
Specialty CFLs	0	147	147
LED Bulbs	113	326	439
LED Fixtures	4	6	10
Linear Fluorescent Lamps	0	10	10
HID Lamps	0	0	0
Linear Fluorescent Ballasts	0	1	1
Total Residential Evaluation Research Gross MWh Savings	181	581	762
Evaluation Research Gross MWh Realization Rate	22%	19%	20%
Non-Residential Evaluation Research Gross MWh Savings			
Standard CFLs	17,336	24,560	41,896
Specialty CFLs	7	41,797	41,805
LED Bulbs	30,102	86,654	116,756
LED Fixtures	9,656	14,156	23,812
Linear Fluorescent Lamps	15	22,425	22,439
HID Lamps	0	903	903
Linear Fluorescent Ballasts	0	1,703	1,703
Total Non-Res Evaluation Research Gross MWh Savings	57,117	192,198	249,315
Evaluation Research Gross MWh Realization Rate	96%	95%	95%
Total Evaluation Research Gross MWh Savings			
Standard CFLs	17,400	24,651	42,051
Specialty CFLs	7	41,945	41,952
LED Bulbs	30,216	86,980	117,196
LED Fixtures	9,660	14,162	23,822
Linear Fluorescent Lamps	15	22,434	22,449
HID Lamps	0	903	903
Linear Fluorescent Ballasts	0	1,704	1,704
Total Evaluation Research Gross MWh Savings	57,298	192,779	250,077
Evaluation Research Gross MWh Realization Rate	95%	94%	94%

Source: Evaluation Team analysis.

Table 7-7. Evaluation Research Gross MW Savings Estimates by Measure Type

	Retail Program	Distributor Program	Total
Residential Evaluation Research Gross MW Savings			
Standard CFLs	0.07	0.09	0.16
Specialty CFLs	0.00	0.15	0.15
LED Bulbs	0.11	0.32	0.44
LED Fixtures	0.00	0.01	0.01
Linear Fluorescent Lamps	0.00	0.01	0.01
HID Lamps	0.00	0.00	0.00
Linear Fluorescent Ballasts	0.00	0.00	0.00
Total Residential Evaluation Research Gross MW Savings	0.2	0.6	0.8
Evaluation Research Gross MW Realization Rate	22%	19%	20%
Non-Residential Evaluation Research Gross MW Savings			
Standard CFLs	4.1	5.8	9.89
Specialty CFLs	0.0	9.5	9.52
LED Bulbs	7.0	20.2	27.21
LED Fixtures	1.7	2.5	4.19
Linear Fluorescent Lamps	0.0	3.9	3.93
HID Lamps	0.0	0.2	0.17
Linear Fluorescent Ballasts	0.0	0.3	0.30
Total Non-Res Evaluation Research Gross MW Savings	12.8	42.4	55.2
Evaluation Research Gross MW Realization Rate	97%	94%	95%
Total Evaluation Research Gross MW Savings			
Standard CFLs	4.2	5.9	10.1
Specialty CFLs	0.0	9.7	9.7
LED Bulbs	7.1	20.5	27.6
LED Fixtures	1.7	2.5	4.2
Linear Fluorescent Lamps	0.0	3.9	3.9
HID Lamps	0.0	0.2	0.2
Linear Fluorescent Ballasts	0.0	0.3	0.3
Total Evaluation Research Gross MW Savings	13.0	43.0	56.0
Evaluation Research Gross MW Realization Rate	93%	90%	90%

Source: Evaluation Team analysis.

Table 7-8. PY6 Evaluation Research Gross Impact Savings Estimates by Measure Type - Peak MW

	Retail Program	Distributor Program	Total
Residential Evaluation Research Gross Peak MW Savings			
Standard CFLs	0.01	0.01	0.02
Specialty CFLs	0.00	0.01	0.01
LED Bulbs	0.01	0.03	0.05
LED Fixtures	0.00	0.00	0.00
Linear Fluorescent Lamps	0.00	0.00	0.00
HID Lamps	0.00	0.00	0.00
Linear Fluorescent Ballasts	0.00	0.00	0.00
Total Residential Evaluation Research Gross Peak MW Savings	0.02	0.06	0.08
Evaluation Research Gross Peak MW Realization Rate	22%	19%	20%
Non-Residential Evaluation Research Gross Peak MW Savings			
Standard CFLs	3.9	5.6	9.48
Specialty CFLs	0.0	8.4	8.38
LED Bulbs	6.4	18.5	24.93
LED Fixtures	1.6	2.3	3.91
Linear Fluorescent Lamps	0.0	3.7	3.72
HID Lamps	0.0	0.2	0.16
Linear Fluorescent Ballasts	0.0	0.3	0.29
Total Non-Res Evaluation Research Gross Peak MW Savings	11.9	38.9	50.9
Evaluation Research Gross Peak MW Realization Rate	97%	94%	95%
Total Evaluation Research Gross Peak MW Savings			
Standard CFLs	3.9	5.6	9.5
Specialty CFLs	0.0	8.4	8.4
LED Bulbs	6.4	18.5	25.0
LED Fixtures	1.6	2.3	3.9
Linear Fluorescent Lamps	0.0	3.7	3.7
HID Lamps	0.0	0.2	0.2
Linear Fluorescent Ballasts	0.0	0.3	0.3
Total Evaluation Research Gross Peak MW Savings	12.0	39.0	51.0
Evaluation Research Gross Peak MW Realization Rate	97%	94%	94%

Source: Evaluation Team analysis.

7.1.4 Evaluation Research Net Impact Findings

7.1.4.7 Net-to-Gross Ratio

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). In PY6, two primary methods were used to estimate the NTGR:

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

The end-user in-depth interviews were added in PY6 as a means of collecting detailed program influence data from a select group of high priority participants. End-users were selected for inclusion in the in-depth interviews based on the size of their program participation (purchasing large quantities of program bulbs) or their representativeness of a particular type of program participant.

7.1.4.8 Customer Self-Report Method

The overall NTGR (without spillover) 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 BILD 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 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.

As shown in Table 7-9, the overall end-user self-reported NTGR estimate across all PY6 bulb types was estimated to be 0.68, 0.07 of which was the result of participant spillover. The table below also provides NTGR estimates by bulb type and shows how LEDs again in PY6 had the highest NTGR estimate and Linear FL continued to have the lowest NTGR estimate. Spillover in PY6 was calculated as an overall spillover rate across all bulb types. The derivation of each of these estimates is provided in the section below.

Table 7-9. End-User Customer Self-Reported NTGR

Population		n	Program Bulb Sales	NTGR w/o Spillover	Spillover	NTGR w/ Spillover
Overall Weighted		222	2,234,649	0.62	0.07	0.68
Bulb Type	CFLs	82	691,030	0.61	0.07	0.68
	LEDs	125	702,716	0.70	0.07	0.77
	Linear FL	74	840,903	0.55	0.07	0.61

Source: Evaluation Team Analysis of End-user Survey and In-depth Interview Data

The calculation of the end-user NTGR estimate was composed of a number of steps to come up with the final recommended NTGR estimate for each bulb type (CFLs, LEDs and Linear Fluorescents). The first step involves scoring each of the survey respondents with the free-ridership (FR) scoring algorithm which assigns a bulb type specific FR estimate to each program participant.[45] Each of these scores is then manually reviewed along with any consistency checks and other open-end responses in order to verify the FR estimate assigned is appropriate. In a few cases respondents were dropped due to serious conflicting information that was provided during the survey making it impossible to determine the appropriate FR score or assigned a different FR score based on their other responses. In PY6 a few new steps were added to the NTGR estimation analysis. The first new step was a segmentation of the bulb type specific participants by a number of different segmentation variables (provided in the section below), and the second step involved conducting in-depth NTGR focused interviews with a few key program participants[46] to be able to better assess through a professional interview the impact the program had on their bulb purchases. The final step in the FR analysis was to calculate an overall NTGR estimate (without spillover) for each bulb type by using participant population bulb-weights applied to the various segments NTGR estimates (1-FR score) derived from end-user survey and in-depth interview data.

CFL NTGR Analysis

Analysis of the individual respondent specific CFL NTGR (without spillover) estimates indicated a trend existed between the volume of program CFLs bulbs a participant purchased and the influence the program had on their purchase. As shown in Table 7-10, segmentation of the surveyed respondents by the volume of CFLs they were purchasing yielded NTGR estimates that ranged from a high of 0.72 for those purchasing more than 500 CFLs to a low of 0.41 for those purchasing 100 or fewer bulbs. Weighting these NTGR results based on the percentage of the overall BILD program participant population whose purchases fell into one of these three buckets (based on the program tracking data) resulted in an overall NTGR (without spillover) estimate of 0.61 for program CFLs.

[45] Survey respondents who bought multiple bulb types through the BILD program were only queried on one bulb type and thus only assigned one NTGR estimate to limit respondent fatigue.
[46] The in-depth end-user interviews were focused on participants purchasing LEDs or Linear Fluorescent bulbs.

Table 7-10. CFL Segmented NTGR Scores and Resulting Bulb-Weighted Average NTGR Score

CFL Segmentation	% of Program Population	End-User Survey FR Estimate
Program Participants buying 100 or fewer bulbs	16%	0.41
Program Participants buying between 101-499 bulbs	30%	0.53
Program Participants buying more than 500 bulbs	54%	0.72
Overall Bulb-Weighted CFL NTGR Estimate		0.61

Source: Evaluation Team Analysis of End-user Survey Data

LED NTGR Analysis

Analysis of the individual respondent specific LED NTGR (without spillover) estimates indicated a trend existed between the type of customer purchasing the program LEDs and the influence the program had on their purchase. As shown in Table 7-11, segmentation of the surveyed respondents by the type of customer yielded NTGR estimates that ranged from a high of 0.83 for Lighting Retrofit contractors to a low of 0.67 for standard electrical contractors (all bulbs sold through the retail channel were included here due to the theory that these are the primary types of customers who buy bulbs through the retail channel). Weighting these NTGR results based on the percentage of the overall BILD program participant population who were believed to fall into these customer segments (based on program tracking data) resulted in an overall NTGR (without spillover) estimate of 0.70 for program LEDs.

Table 7-11. LED Segmented NTGR Scores and Resulting Bulb-Weighted Average NTGR Score

LED Segmentation	% of Program Population	EU Survey NTGR Estimate	NTGR Source
Standard Electrical Contractors	8%	0.67	EU Survey-Contractor
Lighting Retrofit Contractors	11%	0.83	EU Interviews
Retail Program	24%	0.67	EU Survey-Contractor
Remaining Participants	57%	0.69	EU Survey-Non-Contractor
Overall Bulb-Weighted LED NTGR Estimate		0.70	

Source: Evaluation Team Analysis of End-user Survey Data

Linear Fluorescent NTGR Analysis

Similarly for Linear Fluorescent bulbs, analysis of the individual respondent specific Linear FL NTGR (without spillover) estimates indicated a trend existed between the type of customer purchasing the program Linear FLs and the influence the program had on their purchase. As shown in Table 7-12, segmentation of the surveyed respondents by the type of customer yielded NTGR estimates that ranged from a high of 0.60 for general customers purchasing Linear FL through the program lighting distributors to a low of 0.37 for a single large retail chain customer who was both surveyed as part of the end-user survey and re-contacted during the end-user interviews. Weighting these NTGR results based on the

percentage of the overall BILD program participant population who were believed to fall into these customer segments (based on program tracking data) resulted in an overall NTGR (without spillover) estimate of 0.55 for program Linear FLs.

Table 7-12. LF Segmented NTGR Scores and Resulting Bulb-Weighted Average NTGR Score

LF Segmentation	% of Program Population	EU Survey NTGR Estimate	NTGR Source
Standard Electrical Contractors	2%	0.59	EU Survey-Contractor
Lighting Retrofit Contractors	52%	0.51	EU Interviews
Single Large Retail Chain	4%	0.37	EU Survey
Remaining Participants	42%	0.60	EU Survey-Non-Contractor
Overall Bulb-Weighted LED NTGR Estimate		0.55	

Source: Evaluation Team Analysis of End-user Survey Data

Spillover

Calculating bulb type specific spillover presents a challenge as many customers through the BILD program were motivated to purchase energy efficient bulbs without an incentive of a type of bulb that they did not buy through the program (for example, a customer may have purchased CFLs through the program which in some way influenced them to then buy LEDs outside of the program). Because of this determining the appropriate spillover denominator is questionable. The analysis of spillover purchases found very similar levels of spillover bulbs purchased by bulb type (shown in Table 7-13) and thus a total program spillover was calculated as the sum of all spillover bulbs purchased divided by the total number of program bulbs purchased (of all types) by end-user survey respondents. The resulting program wide spillover was estimated to be 7%.

Table 7-13. LF Segmented NTGR Scores and Resulting Bulb-Weighted Average NTGR Score

LF Segmentation	Spillover Purchases	Program Bulb Purchases by Respondents	Overall Spillover
CFLs	3,154		
LEDs	4,268		
Linear Fluorescents	4,807		
Overall Estimated Participant Spillover	12,229	177,666	7%

Source: Evaluation Team Analysis of End-user Survey Data

7.1.4.9 *Supplier Self-Report Method*

The overall net-to-gross estimate (excluding spillover[47]) from the BILD distributor interviews was estimated to be 0.58 which is very consistent with the results from the customer self-report method. The distributor based NTGR estimates are based upon interviews with 51 distributors who make up roughly 50% of overall PY6 BILD program bulb sales. While the number of distributor interviews completed in PY6 was significantly larger than PY5 (this year the surveys were administered as on-line surveys as opposed to telephone interviews), the number of respondents who indicated that they had sold non-incentivized energy efficient bulbs as a result of the program (spillover) but who could not estimate the number of bulbs they had was very high. This resulted in difficulty estimating spillover using this NTGR method.

Table 7-14 below shows the bulb-weighted free-ridership (FR) and NTGR estimates for each of the bulb types queried in the distributor surveys. To calculate the level of free ridership by bulb type, individual distributor's estimates of the percentage of bulbs they would have sold in the absence of the program incentives and program materials were weighted by the overall volume of bulbs sold by that distributor. These weighted distributor level FR estimates were then averaged across all distributors' responses. NTGR was then set equal to one minus the free ridership level. The supplier SR NTGR ranged from a high of 0.73 for LEDs to a low of 0.44 for Linear FL bulb.

Table 7-14. Supplier Self-Report NTGR by Bulb Type

Supplier Self-Report NTGR	Bulb Type			
	Standard CFL	Specialty CFL	LED	Linear FL
N	31	28	48	26
Bulb-Weighted Free ridership	50%	33%	27%	56%
NTGR Estimate (without spillover)	0.50	0.67	0.73	0.44

Source: Evaluation Team Analysis of Distributor Interview Data

7.1.4.10 *Comparison of Net Impact Results across Methods*

Table 7-15 presents estimated NTGR resulting from the two NTGR methods employed during the PY6 evaluation. The supplier self-report NTGR is regarded as a directional indicator to give context to the end-user self-report NTGR. However, due to the more robust end-user self- report algorithm that considers numerous aspects of free ridership and the generalized estimates provided by the distributors, the evaluation team recommends using the end-user self-report results to calculate the PY6 Evaluation Research results.

[47] Although spillover was detected in the Distributor interviews, we were unable to quantify the amount of spillover as the majority of respondents were unable to provide an estimate of the number of spillover bulbs purchased.

Table 7-15. NTGR Estimates by Evaluation Method

Evaluation Method	Data Source	CFL	LED	Linear FL	Overall
Customer Self-Report[48]	End-user Surveys and In-depth Interviews	0.61	0.70	0.55	0.62
Supplier Self-Report[49]	Distributor In-depth Interviews	0.59	0.73	0.44	0.58
Spillover	End-user Surveys	0.07	0.07	0.07	0.07
Customer Self-Report[50]	End-user Surveys and In-depth Interviews	0.68	0.77	0.61	0.68
Recommended PY6 NTGR Estimate		0.68	0.77	0.61	0.68

Source: Evaluation analysis

The PY6 evaluation again found nearly 50 percent of the end-users purchasing program Linear FL bulbs were free-riders (free-ridership was estimated to be 0.45). These NTGR results for Linear FL bulbs are not unexpected as they are similar to result found in prior evaluation years in ComEd service territory and elsewhere in the U.S.

Table 7-16, Table 7-17, and Table 7-18 present the PY6 Evaluation Research net energy, demand, and peak demand savings estimates. The Evaluation Research Net Realization Rates are equal to the Evaluation Research Net Savings estimate / Verified Net Savings estimate and are driven primarily by the Gross Realization Rates from tables Table 7-6 through Table 7-8, and, to a lesser extent, by differences between Evaluation Research NTG values and the SAG recommended NTG used for the Verified Savings estimates.

[48] Excluding Spillover.
[49] Excluding Spillover.
[50] Including Spillover.

Table 7-16. PY6 Evaluation Research Net Impact Savings Estimates by Measure Type - MWh

	Retail Program	Distributor Program	Total
Residential Evaluation Research Net MWh Savings			
Standard CFLs	44	62	105
Specialty CFLs	0	101	101
LED Bulbs	87	250	336
LED Fixtures	3	5	8
Linear Fluorescent Lamps	0	6	6
HID Lamps	0	0	0
Linear Fluorescent Ballasts	0	1	1
Total Residential Evaluation Research Net MWh Savings	134	423	557
Evaluation Research Net MWh Realization Rate	26%	22%	23%
Non-Residential Evaluation Research Net MWh Savings			
Standard CFLs	11,826	16,754	28,581
Specialty CFLs	5	28,513	28,518
LED Bulbs	23,045	66,339	89,384
LED Fixtures	7,392	10,837	18,230
Linear Fluorescent Lamps	9	13,773	13,782
HID Lamps	0	691	691
Linear Fluorescent Ballasts	0	1,304	1,304
Total Non-Res Evaluation Research Net MWh Savings	42,278	138,212	180,490
Evaluation Research Net MWh Realization Rate	113%	109%	110%
Total Evaluation Research Net MWh Savings			
Standard CFLs	11,870	16,816	28,686
Specialty CFLs	5	28,614	28,619
LED Bulbs	23,132	66,588	89,720
LED Fixtures	7,395	10,842	18,237
Linear Fluorescent Lamps	9	13,779	13,788
HID Lamps	0	691	691
Linear Fluorescent Ballasts	0	1,304	1,304
Total Evaluation Research Net MWh Savings	42,411	138,635	181,047
Evaluation Research Net MWh Realization Rate	112%	107%	108%

Source: Evaluation Team analysis.

Table 7-17. PY6 Evaluation Research Net Impact Savings Estimates by Measure Type - MW

	Retail Program	Distributor Program	Total
Residential Evaluation Research Net MW Savings			
Standard CFLs	0.04	0.06	0.11
Specialty CFLs	0.00	0.10	0.10
LED Bulbs	0.09	0.25	0.33
LED Fixtures	0.00	0.00	0.01
Linear Fluorescent Lamps	0.00	0.01	0.01
HID Lamps	0.00	0.00	0.00
Linear Fluorescent Ballasts	0.00	0.00	0.00
Total Residential Evaluation Research Net MW Savings	0.1	0.4	0.6
Evaluation Research Net MW Realization Rate	26%	22%	23%
Non-Residential Evaluation Research Net MW Savings			
Standard CFLs	2.8	4.0	6.7
Specialty CFLs	0.0	6.5	6.5
LED Bulbs	5.4	15.5	20.8
LED Fixtures	1.3	1.9	3.2
Linear Fluorescent Lamps	0.0	2.4	2.4
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Non-Res Evaluation Research Net MW Savings	9.5	30.6	40.1
Evaluation Research Net MW Realization Rate	114%	108%	109%
Total Evaluation Research Net MW Savings			
Standard CFLs	2.8	4.0	6.9
Specialty CFLs	0.0	6.6	6.6
LED Bulbs	5.5	15.7	21.2
LED Fixtures	1.3	1.9	3.2
Linear Fluorescent Lamps	0.0	2.4	2.4
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Evaluation Research Net MW Savings	9.6	31.0	40.6
Evaluation Research Net MW Realization Rate	109%	103%	104%

Source: Evaluation Team analysis.

Table 7-18. PY6 Evaluation Research Net Impact Savings Estimates by Measure Type – Peak MW

	Retail Program	Distributor Program	Total
Residential Evaluation Research Net Peak MW Savings			
Standard CFLs	0.00	0.01	0.01
Specialty CFLs	0.00	0.01	0.01
LED Bulbs	0.01	0.03	0.03
LED Fixtures	0.00	0.00	0.00
Linear Fluorescent Lamps	0.00	0.00	0.00
HID Lamps	0.00	0.00	0.00
Linear Fluorescent Ballasts	0.00	0.00	0.00
Total Residential Evaluation Research Net Peak MW Savings	0.01	0.04	0.06
Evaluation Research Peak MW Realization Rate	26%	23%	23%
Non-Residential Evaluation Research Net Peak MW Savings			
Standard CFLs	2.7	3.8	6.5
Specialty CFLs	0.0	5.7	5.7
LED Bulbs	4.9	14.2	19.1
LED Fixtures	1.2	1.8	3.0
Linear Fluorescent Lamps	0.0	2.3	2.3
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Non-Res Evaluation Research Net Peak MW Savings	8.8	28.1	36.9
Evaluation Research Peak MW Realization Rate	114%	108%	109%
Total Evaluation Research Net Peak MW Savings			
Standard CFLs	2.7	3.8	6.5
Specialty CFLs	0.0	5.7	5.7
LED Bulbs	4.9	14.2	19.1
LED Fixtures	1.2	1.8	3.0
Linear Fluorescent Lamps	0.0	2.3	2.3
HID Lamps	0.0	0.1	0.1
Linear Fluorescent Ballasts	0.0	0.2	0.2
Total Evaluation Research Net Peak MW Savings	8.8	28.1	37.0
Evaluation Research Peak MW Realization Rate	113%	107%	109%

Source: Evaluation Team analysis.

7.2 Detailed Process Findings

The process evaluation of the PY6 BILD program Evaluation assessed the program processes impacting distributors and end use customers who participated in the program. On the distributor side, we explored sales methods and target markets, program marketing and perceived customer awareness of the program, satisfaction with the program, challenges and barriers to participation, federal regulatory changes, and distributor recommendations for program improvement. For end-users, we examined the reach of program marketing, types of participating end-users, usage of and purchasing decisions for CFLs, LEDs and Reduced Wattage Linear Fluorescent lamps, federal regulatory changes, and satisfaction and barriers to purchasing program bulb types. Data sources for the process evaluation include the distributor surveys (n=51) and the end-user telephone surveys (n=282).

7.2.1 Distributor Program Participation and Sales

From PY4 to PY5, the BILD Program changed its product mix and significantly grew the program both in terms of the number of bulbs sold and the number of participating distributors. Comparatively, the program remained relatively stable in PY6 (Table 7-19). The most notable change in PY6 was the addition of linear fluorescent ballasts as a new product category, which comprised approximately three percent of unit sales. Additionally, LED sales continued to grow, increasing from 16% to 33% of unit sales. Meanwhile, CFL sales decreased from 45% of the program in PY5 to 29% in PY6.

Table 7-19. Distribution of Program Unit Sales by Product Type and Program Year

Bulb Type	PY5	PY6
CFL - Standard	19%	14%
CFL – Specialty	26%	15%
LED	16%	33%
Linear Fluorescent	38%	35%
Metal Halide	< 1%	< 1%
LF Ballasts	NA	3%
Total	100%	100%

Source: Evaluation analysis of BILD Tracking Data

While some existing distributors left the program and some new distributors joined, the overall population of participating distributors remained quite stable. The number of participating distributors increased from 84 to 89 and the number of distributor locations increased from 166 to 189 (Table 7-20). Sixty-three of the individual locations were retail Do-it-Yourself stores selling products through the retail component of the BILD program. Overall, the BILD program manager estimates that 75% of the lighting distributors in the ComEd service territory are enrolled in the program.

Table 7-20. Number of Participating Distributors by Program Year

Participants	PY5	PY6
Distributors	84	89
Locations	166	189

Source: Evaluation analysis of BILD Tracking Data

As a midstream program, distributors are critical to the success of the program. To better understand the aspects of the BILD program that are most attractive to them, distributors were asked about their primary reasons for participation. The incentives the BILD program provides was a primary reason for distributors to participate (69%). Other key reasons for participation include, maintaining a competitive advantage (59%), promoting energy efficiency (55%), and saving their customers money (55%) (Table 7-21).

Table 7-21. Primary Reasons for Participating

Reason	n Respondents	% of Distributors
Incentives for products the market demands	35	69%
Competitive advantage	30	59%
Promoting energy efficiency	28	55%
Saving customers money	28	55%
Affiliation with ComEd	13	25%
Customer request	9	18%
Marketing purposes	4	8%

Source: Evaluation analysis of Distributor Survey Data

Overall, the distributors surveyed were satisfied with the program and its various elements. Distributors were asked to rate different aspects of the program using a scale that ranges from zero ("very dissatisfied") to ten ("very satisfied") (see Table 7-22). Distributors reported high satisfaction with the program overall (96% gave a rating between seven and ten indicating they were satisfied). For the individual program components, satisfaction is highest for program managers and other BILD staff (96% satisfied). Satisfaction is also high for incentive processing and the program's impact on sales. While satisfaction with the enrollment process and requirements for reporting sales was also relatively high (80% or more respondents satisfied), some distributors were moderately satisfied with these aspects of the program as well. Distributors were generally satisfied with the incentive levels for most product types. Interestingly, despite the high cost, distributors are the most satisfied with the incentives offered for LEDs (80% satisfied). This is true despite the fact that incentives for standard LEDs were reduced by half (from $8.00 to $4.00) mid-way through the program year. It is also interesting that distributors are the least satisfied with the program incentives for reduced wattage linear fluorescent lamps. Distributors generally report that the incremental cost of a reduced wattage linear fluorescent is $1.00-$2.00, which means that the majority of the incremental cost is covered by the incentive. In in-depth interviews, certain high volume distributors indicated that their extremely high sales of standard efficiency linear fluorescent

lamps leads to a larger incremental cost for the efficient lamps and that the $1.00 incentive is not sufficient to sway the end users toward the efficient products.

Table 7-22. Satisfaction with Program Elements

Program Element	n	Satisfied (7-10)	Moderately Satisfied (4-6)	Dissatisfied (0-3)	Mean (0-10)
The program in general	51	96%	2%	2%	8.7
Program managers and other staff involved in the BILD program	51	96%	4%	0%	9.0
Incentive processing	51	88%	12%	0%	8.4
Sales that the program incentives have generated for your organization	51	84%	14%	2%	8.5
Enrollment process	51	82%	18%	0%	8.2
Requirements for reporting sales in order to receive reimbursements	51	80%	14%	6%	8.0
Incentives offered for LED lamps and fixtures	51	80%	16%	4%	8.1
*Incentives offered for CFL lamps	41	73%	20%	7%	7.5
*Incentives offered for linear fluorescent lamps	46	61%	30%	9%	7.2

*n does not equal 51 due to "Not applicable" response
Source: PY6 BILD Distributor Interviews

In PY6 the BILD distributor program implementation was transitioned to a new firm. Just over half (54%) of the 37 returning distributors surveyed felt the program was better compared to past years' under the new implementer while 46% felt it was the same. No distributors felt the program had gotten worse under the new implementer.

Despite the overall high levels of satisfaction, a quarter of distributors (25% or 13 of 51) reported experiencing challenges related to their participation in the BILD program. These distributors were asked about the types of challenges they experienced. No particular challenge was widespread across all the distributors who participated. Rather, it seems the program requirements are a challenge for the handful of distributors whose internal processes are not set up to track and easily provide the necessary information. The most frequent challenge mentioned was the program reporting requirements (six of 51 distributors). Somewhat related to reporting requirements, three of 51 distributors said that finding time to make sure products they sell are qualified for the program was burdensome:

"Making sure that all of the products we are selling are approved is a big challenge as is the data submission process"

"It is a cumbersome process looking up UPC codes for each light bulb."

Two of 51 distributors noted the added challenge of dedicating resources to updating their internal databases to account for pricing changes during the program year.

"Had to spend a lot of time on keeping our internal database updated with the correct BILD amounts and BILD eligible products. The change for A-lamps from $8 to $4 in January required mass updates. Then the change for A-lamps from $4 to $6 in June required more mass updates."

7.2.2 Product Familiarity and Replaced Bulb Types

Across the three bulb types, most customers were either very or somewhat familiar with the bulbs prior to purchasing them (see Table-7-23). Familiarity with LEDs and reduced wattage linear fluorescents lag somewhat behind CFLs. Familiarity with LEDs prior to purchasing them is lower in PY6 than in PY5 (37% very familiar compared to 49% in PY5) suggesting that more customers with less prior knowledge of the bulbs may be giving LEDs a try. Familiarity with other bulb types is either higher or the same as in PY5.

Table-7-23. End-User Familiarity with Bulbs Prior to Purchase

	CFLs		LEDs		Linear Fluorescents	
Familiarity	PY6	PY5	PY6	PY5	PY6	PY5
Very familiar	70%	61%	37%	49%	47%	47%
Somewhat familiar	26%	24%	48%	39%	41%	35%
Not too familiar	0%	7%	0%	7%	0%	16%
Not at all familiar	4%	8%	15%	5%	12%	2%
N	81	96	125	82	73	51

Source: PY5 and PY6 BILD End-User Customer Survey

A majority of the customers who purchased discounted CFLs and LEDs through the program replaced less efficient bulbs (see Table 7-24). CFLs and LEDs were most frequently installed in place of incandescents (47% CFLs and 32% LEDs) (see Table 7-24). Customers installing LEDs also replaced halogens (18% of customers), which is likely due to the frequent use of halogens in recessed sockets. Customers are also replacing CFLs with both CFLs and LEDs. Twenty-two percent of customers reported that the CFLs they purchased would replace all or mostly CFLs while 15% said the LEDs would replace all or mostly CFLs. Because some users do not like the light quality of CFLs we might expect that more LEDs would replace CFLs, but that is not case. Instead, early users of CFLs may be replacing burnt out CFLs with new CFLs.

Table 7-24. Bulbs that CFLs and LEDs Replaced

Types	CFLs	LEDs
All Incandescents	36%	24%
All CFLs	17%	12%
Mostly Incandescents	11%	8%
Half Incandescents and Half CFLs	11%	8%
Mixture of bulb types	11%	13%
Mostly CFLs	5%	3%
Halogens	2%	18%
Other	1%	7%
LEDs	0%	1%
Don't know	4%	6%
Refused	1%	0%
n	81	125

Source: PY6 BILD End-User Customer Survey

Similarly, the majority of customers who purchased discounted linear fluorescents replaced less efficient lamps. Standard linear fluorescents were the most frequently replaced (31%) followed by T12s (29%).

Table 7-25. Linear Fluorescent Bulbs that Reduced Wattage Bulbs Replaced

Types	Linear Fluorescents
All standard linear fluorescents	31%
T12s	29%
Mixture of bulb types	19%
All reduced wattage linear fluorescents	7%
Don't know	6%
Mostly standard linear fluorescents	3%
Mostly reduced wattage linear fluorescents	1%
Refused	1%
n	100%

Source: PY6 BILD End-User Customer Survey

7.2.3 Program Marketing

The BILD program uses discounts and information about the benefits of energy efficient lighting to encourage commercial customers to purchase energy efficient bulbs instead of less efficient alternatives. Distributors play a key role by making their customers aware of energy efficient lighting options, the

benefits of these products, and the program discounts that are available. The program provides training and marketing materials to help distributors with their customer interactions. In PY6, the program provided distributors with posters, brochures, and a trifold with program information which contained more condensed information compared to previous years. Among the fourteen returning distributors who received the marketing materials and who had an opinion, attitudes were mixed on the quality of the materials compared to last year. Half (50%) felt the materials were better compared to last year while 43% said they were about the same, 7% (one respondent) felt they were worse.

The distributor and end-user surveys provide mixed results on the use of program marketing materials overall. Just over half (55%) of the distributors we interviewed said they received BILD marketing materials. Of these, three quarters (75%) used the marketing materials provided by the program. Distributor opinions on the effectiveness of these materials in their organizations' effort to promote high efficiency bulbs vary. A slight majority (57%) felt the marketing materials were moderately effective at helping their organization to promote high efficiency bulbs (effectiveness rating of 4-6 on a scale that ranges from 0 to 10 where 0 is not at all effective and 10 is very effective). The remaining 42% are split with 21% giving the materials a rating between 0-3 and the other 21% giving a rating of 7-10. Given that distributors were unable to provide any clear suggestions for additional support that ComEd could provide and that 94% feel that they have enough information to make a financial case to their customers for purchasing efficient products, it's possible that distributors don't think they need additional marketing materials. Program staff may consider talking more with distributors one-on-one during their visits to find out if distributors feel they need anything and what it would be.

Table 7-26. Use and Rating of Program Marketing Materials

	n	% of Distributors
Distributor Use of Marketing Materials		
Received Marketing Materials	51	55%
Actively Used Marketing Materials	28	75%
ComEd Marketing Material Effectiveness Ratings		
Very Effective (7-10)	28	21%
Moderately Effective (4-6)	28	57%
Not Effective (0-3)	28	21%

Source: PY6 BILD Distributor Survey

In addition to the marketing materials provided by the program, 86% of distributors say manufacturers also provide them with information that can be used to promote high efficiency products. The majority of distributors who receive these materials find them to be effective (66% rated their effectiveness 7-10), which is a higher rating than the BILD program materials received.

Half of end-users who purchased bulbs through the BILD program (50%) reported seeing the ComEd marketing materials. These customers were asked where they saw the materials, and they provided a mix of responses with some mentioning sources that would originate from ComEd such as a bill insert (20%) while others mentioned their distributor (14%) (Table 7-27).

Table 7-27. Source of Marketing Materials

First Saw Marketing Materials	% of End-Users
Bill Insert	20%
Distributor	14%
Online	10%
Mailing - non-specific	8%
Email	8%
Tradeshow/seminar	7%
Word of mouth	6%
ComEd	3%
Brochure	1%
Other, specify	0%
On Sales Counter	0%
Other	6%
Don't know	16%
N	142

Source: PY6 BILD End-User Customer Survey

End-users who purchased discounted bulbs through the BILD program in PY6 were more likely to be aware that the bulbs they were purchasing were discounted than those who purchased bulbs in PY5. Table 7-28 shows that in PY6, 80% of end-users were aware that they had purchased discounted bulbs, a statistically significant increase from PY5 (72%). End-users who purchased linear fluorescents or LEDs were more likely to know that the bulbs they purchased were discounted (88% and 91% respectively compared to 70% of those purchasing CFLs). In PY6, 86% of customers who were aware of the discount knew that it was provided by ComEd compared to 83% in PY5. Distributors were the main source of information about the discount. Close to three-quarters (73%) of end-users who knew that they had purchased discounted bulbs specifically mentioned that they learned about it through their distributor.

Table 7-28. End-User Awareness of Discount

	PY5 (n=232)	PY6 (n=282)
Aware of discount	72%	80%*
	Among % Aware (n=167)	Among % Aware (n=227)
Aware ComEd is discount sponsor	83%	86%

Source: PY5 and PY6 BILD End-User Customer Surveys

The discount can still influence those who are unaware of it; end-users who are unaware of the discount might not purchase the bulbs if they were full price. Still, it can only help the program to let customers know that they are getting a good deal on the bulbs, which could encourage them to purchase additional

lamps. The program may want to consider additional training for distributors that emphasizes how to most effectively market the program to their customers using the materials provided by the program as well as making customers aware of the discount. Additionally, there is a sense that providing the list of approved products to distributors sooner and providing regular updates on newly qualified products would help distributors promote program bulbs. However, several distributors noted that this is not as big of a problem as in prior program years.

End-users were asked what factors they consider when purchasing lighting for their business. The responses show that price is a leading factor in their purchasing decisions but not the only one (Table 7-29). Top factors include price (26%), the type or wattage of bulb needed for the particular situation (25%), and the bulb type already in the fixture (24%). Energy efficiency was also a factor but for somewhat fewer end-users (14%). Further, when end-user responses were examined by bulb type purchased, the results show that purchase decision priorities differ. Those who purchased CFLs or linear fluorescents are significantly more likely to base their decision on the bulb type already in the fixture than those who purchased LEDs (28% and 30% respectively compared to 20%). Those who purchased LEDs or linear fluorescents are significantly more likely to rely on a recommendation than those who purchased CFLs (16% and 15% respectively compared to 5%). These results suggest that sales reps play an important role in getting end-users to try new products such as LEDs or reduced wattage linear fluorescents that, in the case of LEDs, may cost more than their usual purchase. Since there is an energy efficient option for nearly every situation, it is important that distributors make their customers aware of all the options available so they do not simply purchase what is already in the fixture.

Table 7-29. Factors Considered When Purchasing Light Bulbs

	% of End-Users Total	% of End-Users Purchased CFL	% of End-Users Purchased LED	% of End-Users Purchased LIN
Based on price	26%	30%	24%	18%
Based on what I need type, wattage	25%	26%	28%	27%
Based on the bulb type already in the fixture	24%	28%	20%	30%
Based on energy efficiency	14%	14%	14%	14%
Based on sales rep or other recommendation	13%	5%	16%	15%
Based on availability in the store	4%	7%	1%	3%
I typically buy LEDs	4%	3%	5%	0%
I typically buy CFLs	2%	3%	1%	0%
Based on what is on Sale	1%	1%	1%	0%
I typically buy Linear Fluorescent bulbs	0%	0%	0%	1%
I typically buy incandescents	0%	1%	0%	0%
Don't know	4%	2%	5%	3%
N	280	115	170	73

Percentages do not sum to 100% because respondent could give more than one response.
Source: PY6 BILD End-User Customer Survey

Despite the availability of ComEd discounts on a wide variety of lighting products in PY6, 26% of end-users who purchased discounted bulbs also purchased incandescents for their business. We asked these customers why they purchased incandescents instead of CFLs or LEDs. The responses vary based on bulb type, but distributors could address most of the given reasons with additional training (see Table 7-30). The most frequently mentioned reasons for not purchasing a CFL were that the end-user did not like the way CFLs looked in the fixture (34%), dissatisfaction with the light quality that CFLs produce (31%) and the inability to find the necessary bulb (26%). Given the variety of specialty CFLs available, bulb appearance and availability should no longer be a significant barrier. More difficult barriers for CFL use are dissatisfaction with the light quality, past CFLs used, and concern over mercury. The most common reasons for not purchasing LEDs were that the bulbs were too expensive (43%) and the inability to find the necessary bulb (23%). LEDs may be an alternative option for customers who simply dislike CFLs; however, the high cost of the bulbs is a significant barrier for many incandescent purchasers (43%). As LED prices continue to drop, this barrier should be less significant in the future. In addition, the program could encourage distributors to emphasize the short payback period and lifetime savings from LEDs. Lack of awareness of LEDs is becoming less of a barrier to purchase. Only 11% of end-users said they purchased incandescents instead of LEDs because they were not familiar with the bulbs. In addition, when we asked customers who did not purchase LEDs through the BILD program if they were aware of the bulbs, only seven percent said they were not. This represents a significant decrease in lack of awareness over PY5 (20% were not aware in PY5).

Table 7-30. Reasons for Purchasing Incandescent Bulbs Instead of CFLs or LEDs

Reasons	CFLs	LEDs
Do not like the way CFLs/LEDs look in a fixture	34%	15%
Do not like the quality or brightness of light CFLs produce	31%	15%
Could not find the type of bulb I needed as a CFL/LED	26%	23%
Dissatisfied with past CFLs	22%	NA
CFLs/LEDs are too expensive	14%	43%
Do not like that CFLs contain mercury	14%	NA
Unfamiliar with LEDs that replace standard incandescents	NA	11%

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.
Source: PY6 BILD End-User Customer Survey

When distributors were asked a similar question about the primary reasons customers provide for NOT purchasing certain types of bulbs, the reasons they provide are in line with the end user responses. Aesthetics of specialty bulbs is significantly more of a concern for standard CFLs than it is for specialty and LED bulbs, while the high cost is the primary reason for not purchasing these two bulb types (Table 7-31).

Table 7-31. Reasons Customers Don't Purchase Standard and Specialty CFLs or LEDs

	Standard CFL	Specialty CFL	LED
The appearance of the bulb	55%	32%	6%
Don't like the color	52%	29%	21%
Start time	39%	32%	n/a
High cost	35%	54%	96%
Mercury content	23%	18%	n/a
Not bright enough	16%	21%	4%
Other, please specify	16%	18%	4%
Specialty bulb type needed does not come in a CFL	n/a	25%	n/a
Bulb type needed does not come in an LED	n/a	n/a	4%
n	31	28	48

Source: PY6 BILD Distributor Survey

Lack of awareness of the options, costs, and benefits of reduced wattage linear fluorescents also seems to be an issue for some end-users who purchase linear fluorescents. Just over one-quarter of end-users surveyed (27%) reported purchasing standard efficiency linear fluorescent bulbs for use in their business since June of 2013. When asked why they did not purchase reduced wattage fluorescents instead, approximately one-quarter (24%) said the cost of reduced wattage linear fluorescents was a significant reason for why they purchased standard efficiency bulbs. Another common reason given was a lack of familiarity with reduced wattage linear fluorescent bulbs (23%).

When we asked distributors a similar question about the primary reasons customers provide for not purchasing reduced wattage linear fluorescents, close to two-thirds (64%) said cost is a barrier while just over half said lack of familiarity with the bulbs (52%). In a related question, 69% of the distributors that sell reduced wattage linear fluorescent said that customers are not aware that the incremental cost of reduced wattage linear fluorescent is typically small and mostly offset by the ComEd incentive and that the payback period is also quite short. Distributors are mixed on what it would take to get customers who are purchasing full wattage linear fluorescents to make the switch. Slightly over half (57%) say more education would persuade end-users while another 21% thought a higher incentive would help.

However, the end-user survey indicates that there might be missed opportunities for distributors to more consistently explain the benefits of reduced wattage linear fluorescents. Just over half (nine of the 16) of respondents who said the cost of reduced wattage linear fluorescents was a significant reason for why they purchased standard efficiency bulbs rather than the reduced wattage equivalent also said that a salesperson discussed advantages of efficient linear fluorescent lamps that may compensate for the small incremental cost over standard efficiency equivalents.

7.2.4 Impact of Regulatory Changes

At the end of PY6, of the fifty-one interviewed distributors, 65% reported that their customers were very familiar or somewhat familiar with the EISA regulations. Distributors say the new standards are making customers more aware of energy efficient products and are forcing them to purchase more energy efficient products. As a result, they are stocking and promoting more efficient products. Most are stocking more LEDs (89%) followed by CFLs (65%). However, only 10% say they are stocking more reduced wattage Linear Fluorescents.

When we interviewed end-users, a similar number, 69%, said they aware of EISA. Once the regulations were explained, two thirds (66%) of all end-users expect that the lighting products their organization installs in the future will change as a result. LEDs lead the way in terms of the types of bulbs that end-users expect to purchase that will replace incandescents. Approximately half of end-users expect to install LEDs (49%), one-quarter CFLs (21%) and just under one in ten will install linear or other fluorescents (9%). Only two percent said the phased out bulbs may be replaced with other incandescent bulbs.

7.3 IL TRM Recommendations

As part of the PY6 study, research was conducted to support the IL TRM.

7.3.1 Recommendations for Updates to the IL TRM

As noted in the PY5 evaluation report, the evaluation team recommends updating the IL TRM annually based on 3-year rolling averages of the evaluation primary research based parameter estimates. It should be noted that including a 3-year rolling average of research findings in the TRM reduces volatility that a single year of research could introduce and ensures that the most recent evaluation research estimates are being applied. However, if a significant change is made to the BILD Program that would render the 3-year rolling average inappropriate and justifiably warrants a change to the parameter estimate away from a 3-year rolling average, this should be considered. The evaluation team's recommended parameters for the IL TRM are shown in the following table.

Table 7-32. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
Res/Non-Res Split	4% / 96% CFLs / LEDs 1% / 99% Fixtures / LF / HID	3-year rolling average (PY4-PY6) of Evaluation Research Findings[51]
1st Year Installation Rate	71% CFLs 96% LEDs / HID 98% LF	3-year rolling average (PY4-PY6) of Evaluation Research Findings

Source: Evaluation team analysis.

For the IL TRM v3.0, the recommendation for Res/Non-Res split was to use a three year rolling average based on evaluation research findings. As there were only two years of evaluation research data available for this parameter, the evaluation team provided a weighted average Res/Non-Res split value of 3%/97%

[51] LEDs, linear fluorescent lamps, and HID lamps were not offered through the program in PY4 so estimates of Res / Non-Res split, installation rate, and NTGR for these products is only based on data from PY5 and PY6.

for bulbs and 1%/99% for fixtures (based on the two years of available data). For IL TRM v4.0, the evaluation team again recommends updating the deemed Res/Non-Res split based on a rolling 3-year average from the most recent evaluation research findings from ComEd and Ameren. It is not possible for the evaluation team at this time to estimate what the statewide deemed Res/Non-Res split would be for Illinois TRM v4.0 (effective June 1, 2015 to correspond to ComEd PY8) due to the lack of Ameren IL data; however, Table 7-33 provides three years of evaluation research results for the ComEd program which could be used to estimate the statewide assumption.

Table 7-33. 3-Year Average Res/Non-Res Split for ComEd

Evaluation Program Year	CFLs/LEDs		Fixtures/LF/HID	
	Bulbs	Res/Non-Res Rate	Bulbs	Res/Non-Res Rate
PY4	575,252	6% / 94%	n/a	n/a
PY5	799,871	8% / 92%	515,948	1% / 99%
PY6	1,465,722	2% / 98%	955,387	0.2% / 99.8%
3-Year Weighted Average		4% / 96%		1% / 99%

Source: Evaluation team analysis.

The evaluation team recommends updating the deemed installation rates for commercial lighting products annually based on a rolling 3-year average from the most recent evaluation research findings (from both ComEd and Ameren IL when available). This would insure the deemed installation rates are reflective of the most recent data available. It is not possible at this time to estimate what the statewide deemed installation rate would be for Illinois TRM v4.0 (effective June 1, 2015 to correspond to ComEd PY8) due to the lack of Ameren IL data, however Table 7-34 provides three years of evaluation research results for the ComEd program which could be used to estimate the statewide assumption.

Table 7-34. 3-Year Average Installation Rates for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	ISR	Bulbs	ISR	Bulbs	ISR
PY4	575,252	73%	n/a	n/a	n/a	n/a
PY5	597,438	78%	214,754	91%	503,627	96%
PY6	705,909	64%	806,906	97%	840,903	99%
3-Year Weighted Average		71%		96%		98%

Source: Evaluation team analysis.

During the PY6 study a number of work papers were created to either correct errata or make other significant changes to the draft Illinois v4.0 TRM. These work papers included the following (date of work paper included in parentheses):

- Update the C&I Lighting section with Res/Non-Res Split from Final PY5 Results and Include MF Common Area Parameters where missing (August 4, 2014)

- Specialty CFL section added to future versions of the Commercial portion of the IL TRM.

In addition to these work paper submissions, the evaluation team conducted a thorough review of the draft v4.0 of the IL TRM. This review resulted in a comprehensive list of errors, omissions and changes needed within the Residential and C&I Lighting sections of the TRM.

7.4 NTGR Recommendations

NTGR Estimate for Future Use

The NTGR for PY6 was deemed for bulbs sold through the BILD program based on a Statewide Advisory Group process. This process historically has been referencing the most recently available evaluation-based NTGR estimate as one of the primary inputs for the deemed NTGR estimate. Beginning in PY5, the evaluation team recommended utilizing a weighted rolling 3-year average of the evaluation-based NTGR estimate in this process. This rolling average provides consistency from year-to-year and ensures that the NTGR results from any single year do not drastically alter the resulting net savings. It should be noted that if a significant change is made to the BILD Program that would render the 3-year rolling average NTGR inappropriate, and would justifiably warrant a revised NTGR estimate away from the 3-year rolling average, a single year estimate should be considered. Table 7-35 provides up to three years of evaluation research NTGR estimates (PY4-PY6) for CFLs, LEDs/HID and Linear Fluorescent bulbs, as well as the 3-year weighted averages.

Table 7-35. 3-Year Average NTGR

Program Year	CFLs		LEDs/HID		Linear FL[52]	
	Bulbs	NTGR	Bulbs	NTGR	Bulbs	NTGR
PY4	575,252	0.63	n/a	n/a	n/a	n/a
PY5	597,438	0.66	214,754	0.70	503,627	0.56
PY6	691,030	0.68	705,323	0.77	840,903	0.61
3-year Weighted Average		0.66		0.75		0.59

Source: Evaluation team analysis.

Table 7-36 provides the NTGR Parameters available for deeming for future use, based on recent evaluation research. The "Other" category in Table 7-36 is meant to be used for commercial lighting products that do not fall into the three categories supported by evaluation research. The "Other" values of 0.75 and 0.77 were established based on evaluation research for LEDs, with the presumption that any lighting product not covered by the CFL, LED/HID, or linear fluorescent categories would be most similar to LEDs in terms of product costs, incentive shares, and consumer purchasing decisions. For instance, LED exit signs, wall packs, and Christmas lights would all have relatively high costs and incentives would likely cover a small fraction of overall costs.

[52] These values are also used for linear fluorescent ballasts.

Table 7-36. NTGR Parameters for Future Use

Parameter	Value	Data Source
NTGR	0.66 CFLs 0.75 LEDs/HID 0.59 Linear FL[53] 0.75 Other	3-year rolling average (PY4-PY6) of Evaluation Research Findings
	0.68 CFLs 0.77 LEDs/HID 0.61 Linear FL[54] 0.77 Other	PY6 Evaluation Research Findings

Source: Evaluation team analysis.

7.5 PJM Data and Findings

ComEd Business Instant Lighting Discount Program

Program Year 6 – June 2013 – May 2014

PY6 Ex Post Gross Evaluation Research Peak Demand Savings = 51.0 MW

PY6 Carryover Ex Post Gross Peak Demand Savings = 5.5 MW

Parameters included in the Ex Post Gross Peak Demand calculation include:

1. PY6 Program Bulbs Sold
2. Delta Watts
3. Residential / Non-residential Split
4. Peak Coincidence Factor (Peak CF)
5. Installation Rate
6. Demand Interactive Effects

[53] These values are also used for linear fluorescent ballasts.
[54] These values are also used for linear fluorescent ballasts.

7.6 Data Collection Instruments

7.6.1 PY6 Distributor Interview Guide

PY6 ComEd Business Instant Lighting Discounts Program

Distributor Interview Instrument

Email to each Distributor

Hello. You are receiving this email because your organization is participating in ComEd's Business Instant Lighting Discounts program, also known as the BILD program. As specified in the BILD program participation agreement, your organization agreed to take part in a survey that will ensure the continued success of the BILD program. Opinion Dynamics Corporation is fielding this online survey on behalf of ComEd as part of the evaluation of the BILD program.

The purpose of the survey is to learn about your company's experience with the BILD program and to understand how this program has impacted your sales of program and nonprogram qualifying bulb types. If you are not the person most knowledge about your organizations participation in ComEd's BILD program, please direct us to the correct contact by emailing us at _____. The survey should take less than 30 minutes and all information that is provided will remain strictly confidential. Based on the information you provide, you may be selected for a brief follow-up phone interview.

Your responses to this survey should be reflective of the most recent program year, which is running from **June 1st 2013 through May 31st 2014.**

If you have any questions about this survey please contact Luke Scheidler (BILD Program Evaluator) at 510-844-2899, John Delany (BILD Program Manager) at 630-437-3040, or Steven McVoy (DNV GL Program Implementer) at 630-689-8502.

Please click on the link below to be directed to the web survey. We kindly request that you complete the survey by May 15th 2014.

Thank you for your timely assistance with this important BILD survey.
Luke Scheidler

****

Web Survey

****

Definitions

The following definitions apply to this survey:

Standard CFL Bulbs – ENERGY STAR qualified spiral CFL bulbs that DO NOT have special functions such as reflectors/floods, or dimmable/3-way light levels.

Specialty CFL Bulbs - ENERGY STAR qualified CFL bulbs that HAVE special functions such as reflectors/floods, globes, high wattage (35W+), dimmable, or 3-way light levels.

LED Lamps – LED A-lamps with >= 55 lumens per watt. Candelabra, globe, and MR lamps with >= 42 lumens per watt. PAR lamps and R lamps with >= 55 lumens per watt. LED trim kits (to convert a recessed down-light from incandescent to LED using an Edison base socket lamps) with >= 42 lumens per watt.

Reduced wattage Linear Fluorescent - Any reduced wattage lamp with a minimum of 80 CRI that can replace a standard lamp and be driven on existing ballast. (T5HO <= 51 watt; T5 <= 26 watt; T8 <= 28 watt. 4' product only designed to operate on existing electronic ballasts).

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BILD PROGRAM

Program Year 6: June 1, 2013 through May 31, 2014

Welcome to the ComEd Business Instant Lighting Discounts Trade Ally Survey. We are about to begin. Please remember that all responses should be specific to the most recent BILD program year, which ran from June 1st, 2013 to May 31st, 2014. The survey should take less than 30 minutes, but if you are not able to finish in one session, pressing the "Quit" button will save your progress. Simply return to the web address provided to continue.

Program Participation

1. What were the primary reasons your organization decided to participate in ComEd's Business Instant Lighting Discounts (BILD) program? *Please select up to three.*

1. Incentives for products the market demands
2. Affiliation with ComEd
3. Marketing purposes
4. Competitive advantage
5. Customer request
6. Promoting energy efficiency
7. Saving customers money
0. Other, please specify

Distributor Bulb Sales

[IF MULT_LOCATIONS = 1 or NATIONAL_DIST = 1 ASK Q2 AND Q2b]

2. What proportion of your organization's lighting unit sales are in ComEd's service territory? [Numeric open end, MAX=100]

8. I don't know

[Show the following text below Q2: ComEd serves the Chicago and Northern Illinois area. The service territory roughly borders interstate 80 to the south, the Wisconsin border to the north, the Iowa border to the west, and the Indiana border to the east.]

The ComEd Service Territory in Northern Illinois

Q2b: [If Q2 < 100%] For this next section of questions we'd like your responses to be representative of all of your organization's light bulb sales within ComEd service territory. Are you able to respond in this manner? [Yes, No – please describe which of your sales outlets you are able to respond on behalf of: (Open End)]

4. [If Q2 < 100%] How do you ensure you only give the BILD discount to ComEd customers? [Open End]

3. Product sales – Please indicate the approximate percentage of your organization's total bulb sales (unit sales) within ComEd's service territory that each bulb type represents? This should be all sales and not just sales of bulbs that are discounted by ComEd. *The percentages should add to 100%.*

Incandescent/Halogen Bulbs	____%
Standard CFLs	____%
Specialty CFLs	____%
Full Wattage Linear Fluorescent	____%
Reduced wattage Linear Fluorescent	____%
LEDs (pin or screw based)	____%
Other – TYPE: _____	____%

PY6 Program Bulb Sales

5. [If PY6_StanCFL > 0] According to our records during the most recent BILD program year, your organization sold [**PY6_StanCFL**] STANDARD CFLs through the program. If this is incorrect, please indicate the correct number: [User entry PY6_StanCFL_New][PY6_StanCFL = PY6_StanCFL_New][PY6_StanCFL_WRONG_flag=1]

a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [**PY6_StanCFL**] STANDARD CFLs would you have sold in absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998] [IF DON'T KNOW, SKIP TO Q5F]

b. [If Q0a < 100%] Your previous answer suggests that approximately [100% - Q00] percent of STANDARD CFL sales, or [100% - Q00* **PY6_StanCFL= PY6_StanCFLInc**] bulbs, were directly attributable to the BILD program. For these [**PY6_StanCFLInc**] STANDARD CFL sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other (specify)]

c. [If Q00 = Both] What percent of the [**PY6_StanCFLInc**] STANDARD CFL sales directly attributable to the BILD program do you estimate would have been non-efficient bulb sales in the absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998]

d. [If Q0a = 100%] Your response to the previous question indicates that you believe the BILD program's incentives and promotional materials did not lead to any increase in STANDARD CFL sales for your organization in the past year. Is this correct?[Yes, No]

e. [If Q0d = No] Please explain in your own words the impact of the BILD incentives and promotional materials on your organization's sales of STANDARD CFLs during the past year. [Open end response]

f. What are the primary reasons your customers provide for NOT purchasing high efficiency STANDARD CFLs?
   1. High cost
   2. Don't like the color
   3. Not bright enough
   4. The appearance of the bulb
   5. Start time
   6. Mercury content
   0. Other, please specify

6. [If **PY6_SpecCFL** > 0] According to our records during the most recent BILD program year, your organization sold [**PY6_SpecCFL**] SPECIALTY CFLs through the program. If this is incorrect, please indicate the correct number: [User entry PY6_ **SpecCFL** _New][PY6_ **SpecCFL** = PY6_ **SpecCFL** _New][PY6_ **SpecCFL** _WRONG_flag=1]

a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [PY6_SpecCFL] SPECIALTY CFLs would you have sold in absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998] [IF DON'T KNOW, SKIP TO Q6F]

b. [If Q6a < 100%] Your previous answer suggests that approximately [100% - Q6a] percent of SPECIALTY CFL sales, or [100% - Q6a* PY6_SpecCFL = PY6_SpecCFLInc] bulbs, were directly attributable to the BILD program. For these [PY6_SpecCFLInc] SPECIALTY CFL sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]

c. [If Q6b = Both] What percent of the [PY6_SpecCFLInc] SPECIALTY CFL sales directly attributable to the BILD program do you estimate would have been non-efficient bulb sales in the absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998]

d. [If Q6a = 100%] Your response to the previous question indicates that you believe the BILD program's incentives and promotional materials did not lead to

any increase in SPECIALTY CFL sales for your organization in the past year. Is this correct? [Yes, No]

e. [If Q6d = No] Please explain in your own words the impact of the BILD incentives and promotional materials on your organization's sales of SPECIALTY CFLs during the past year. [Open end response]

f. What are the primary reasons your customers provide for NOT purchasing high efficiency SPECIALTY CFLs?

1. High cost
2. Don't like the color
3. Not bright enough
4. The appearance of the bulb
5. Start time
6. Mercury content
7. Specialty Bulb Type needed does not come in a CFL
0. Other,please specify

7. [If **PY6_LED** > 0] According to our records during the most recent BILD program year, your organization sold [**PY6_LED**] LEDs through the program. If this is incorrect, please indicate the correct number: [User entry PY6_ **LED** _New][PY6_ **LED** = PY6_ **LED** _New][PY6_ **LED** _WRONG_flag=1]

a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [PY6_LED] LEDs would you have sold in absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998] [IF DON'T KNOW, SKIP TO Q7F]

b. [If Q7a < 100%] Your previous answer suggests that approximately [100% - Q7a] percent LED sales, or [100% - Q7a* PY6_LED = PY6_LEDInc] bulbs, were directly attributable to the BILD program. For these [PY6_LEDInc] LED sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]

c. [If Q7b = Both] What percent of the [PY6_LEDInc] LED sales directly attributable to the BILD program do you estimate would have been non-efficient bulb sales in the absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998]

d. [If Q7a = 100%] Your response to the previous question indicates that you believe the BILD program's incentives and promotional materials did not lead to any increase in LED sales for your organization in the past year. Is this correct? [Yes, No]

e. [If Q7d = No] Please explain in your own words the impact of the BILD incentives and promotional materials on your organization's sales of LEDs during the past year. [Open end response]

f. What are the primary reasons your customers provide for NOT purchasing high efficiency LEDs?

1. High cost
2. Don't like the color
3. Not bright enough
4. The appearance of the bulb
5. Bulb Type needed does not come in an LED
0. Other, please specify

8. [If **PY6_LF** > 0] According to our records during the most recent BILD program year, your organization sold [**PY6_LF**] <u>REDUCED WATTAGE LINEAR FLUORESCENT BULBS</u> through the program. If this is incorrect, please indicate the correct number: [User entry PY6_ **LF** _New][PY6_ **LF** = PY6_ **LF** _New][PY6_ **LF** _WRONG_flag=1]

a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [PY6_LF] <u>REDUCED WATTAGE</u>LINEAR FLUORESCENT BULBS would you have sold in absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998] [IF DON'T KNOW, SKIP TO Q8F]

b. [If Q6a < 100%] Your previous answer suggests that approximately [100% - Q8a] percent <u>REDUCED WATTAGE</u>LINEAR FLUORESCENT BULB sales, or [100% - Q8a* PY6_LFSales = PY6_LFInc] bulbs, were directly attributable to the

BILD program. For these [PY6_LFInc] REDUCED WATTAGELINEAR FLUORESCENT BULB sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]

c. [If Q8b = Both] What percent of the [PY6_LFInc] REDUCED WATTAGELINEAR FLUORESCENT BULB sales directly attributable to the BILD program do you estimate would have been non-efficient bulb sales in the absence of the program? [Numeric open end, MAX=100, DON'T KNOW=998]

d. [If Q8a = 100%] Your response to the previous question indicates that you believe the BILD program's incentives and promotional materials did not lead to any increase in REDUCED WATTAGELINEAR FLUORESCENT BULB sales for your organization in the past year. Is this correct? [Yes, No]

e. [If Q8d = No] Please explain in your own words the impact of the BILD incentives and promotional materials on your organization's sales of REDUCED WATTAGELINEAR FLUORESCENT BULBS during the past year.

f. Thinking about the T8 and T5 Linear Fluorescent bulbs your organization sold between June 2013 and May 2014, what percentage are full wattage and reduced wattage? *The percentages should add to 100%.*

1. _____% Full Wattage
2. _____% Reduced Wattage
8 . I don't know

g. Have these percentages changed as a result of your organization's participation in the BILD program? [Yes, No]

g_b. [If Yes] PRIOR TO THE BILD PROGRAM, Please indicate what percentage of your linear fluorescent bulb sales were full wattage and reduced wattage. *The percentages should add to 100%.*

1. _____% Full Wattage
2. _____% Reduced Wattage
8. I don't know

h. In your opinion, why are customers continuing to purchase full wattage linear fluorescent bulbs as opposed to reduced wattage linear fluorescent bulbs?

i. Do you believe most customers are aware that the incremental cost of reduced wattage linear fluorescent bulbs is typically small and mostly offset by the ComEd incentive, and the payback is often less than 1 year? [Yes, No]

j. In your opinion, what would it take to get your customers who are purchasing full wattage linear fluorescent bulbs to switch to reduced wattage linear fluorescent lamps?

k. What are the primary reasons your customers provide for NOT purchasing REDUCED WATTAGE LINEAR FLUORESCENT bulbs?

1. Cost
2. Light quality
3. Lack of familiarity
4. Brightness
0. Other, please specify

Efficient Light Bulb Sales

9. On a scale of 1 to 5, with 1 being not at all involved and 5 being very involved, how involved is your organization in helping your customers determine which light bulbs to purchase?

10. As a result of participating in the BILD program, has your organization been actively trying to increase the volume of efficient light bulbs sold relative to full wattage light bulbs? [Yes, No,]

a. [If Q10 = yes] How often do you promote high efficiency bulbs over the full wattage alternative?

1. Always
2. Usually
3. Sometimes
4. Never
5. Depending on the circumstance or customer, please specify

b. [If Q10 = yes] What are the primary sales tactics used by your organization to convince your customers to switch to energy efficient lighting? *Drag each box from the left column to the right column in order of most frequently mentioned (top) to most infrequently mentioned (bottom).*

1. Longer lifetimes
2. Light quality
3. Payback period
4. Annual energy reduction
5. Annual bill savings ($)
6. Reduced O&M
7. "Green" or environmental benefits

c. Are there any other sales tactics you use to convince your customers to switch to energy efficient lighting? [No, Yes – please specify]

11. How important were the following factors in increasing your organization's sales of energy efficient lamps in ComEd's service territory between June 1, 2013 and May 31, 2014. Please use a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant.

a. ComEd's incentive program?
b. A policy within your organization to promote high efficiency products, independent of the program?
c. Your efforts to educate consumers about upfront costs vs. lifetime savings?
d. Customer desire to reduce energy costs?
e. Customer desire to reduced maintenance costs?

12. During this past program year (June 1, 2013 – May 31, 2014) did you sell any high efficiency light bulbs in ComEd's service territory that did not receive discounts from the BILD program? [Yes, No]

a. [If Q12 = yes] What types of efficient bulbs did you sell that did not receive rebates? [Standard CFLs, Specialty CFLs, LEDs, Linear Fluorescent bulbs, Other (specify)]
b_1. [If q12a = Standard CFLs] Can you estimate how many non-discounted Standard CFLs you sold? DON'T KNOW=8
b_2. [If q12a = Specialty CFLs] Can you estimate how many non-discounted Specialty CFLs you sold? DON'T KNOW=8

b_3. [If q12a = LEDs] Can you estimate how many non-discounted LEDs you sold? DON'T KNOW=8
b_4. [If q12a = Linear Fluorescent] Can you estimate how many non-discounted Linear Fluorescent bulbs you sold? DON'T KNOW=8
b_5. [If q12a=0] Can you estimate how many [Q12a open end]s you sold?
c. [If Q12 = yes] Why did these bulbs not receive discounts?
d. [If Q12 = yes] What effects, if any, did the BILD program have on your sales of any high efficiency non-program bulbs?

Program Marketing

13. ComEd developed a variety of program marketing materials for the BILD program including posters, brochures, tri-fold handouts, and counter displays.

a. Did your organization receive these marketing materials? [Yes, No]
b. [If Q13a = Yes] Did you actively use these marketing materials when engaging your customers? [Yes, No]
c. [If Q13a = Yes] What percentage of your customers do you think are exposed to these materials?
d. [If Q13a = Yes and returning distributor = Yes] How do this year's marketing materials compare to prior years?

1. Better
2. Same
3. Worse
8. I don't know
0. Other,please specify

e. [If Q13a = Yes] On a scale of 0 to 10, how effective are the ComEd marketing materials in your organization's efforts to promote high efficiency light bulb sales? [0-10.]
f. What type of additional support could ComEd offer you to assist you with your participation in this program?
g. Do you feel you have enough information to make a financial case to your customers for purchasing efficient products (longer lifetimes, energy savings, payback periods, annual $ savings)? [Yes, No, Other Specify]

14. Do the manufacturers your organization purchases light bulbs from also provide information that can be used to promote high efficiency product sales to your customers? [Yes, No, N/A]

a. [If Q14 = Yes] On a scale of 0 to 10, how effective are the manufacturer provided materials in your organization's efforts to promote high efficiency light bulb sales? [0-10]

Program Satisfaction

15. Please rank your level of satisfaction with the following elements of ComEd's BILD program. Please answer these questions using a 0 to 10 scale, where 0 means very dissatisfied and 10 means very satisfied.

How satisfied are you with ….

a. The BILD enrollment process? [0-10
b. The program's requirements for reporting sales in order to receive reimbursements? [0-10]
c. The incentive processing aspect of the program? [0-10]
d. Satisfaction with the sales that the program has generated for your organization? [0-10]
e. The program managers and other staff involved in the BILD program[0-10]?
f. The program in general[0-10]?

g. The incentives offered for standard CFL bulbs? [0-10, N/A]
h. The incentives offered for specialty CFL bulbs? [0-10, N/A]
i. The incentives offered for LED lamps and fixtures? [0-10, N/A]
j. The incentives offered for linear fluorescents? [0-10, N/A]

IF ANY of the above satisfaction levels are less than 5 ASK: Why are you dissatisfied with [enter question element]? [Open End]]

P1. Did you experience any challenges resulting from your participation in the BILD program? [1=Yes, 2=No]

[If P1=1 ASK, ELSE SKIP to P5]
P2. What type of challenges did you experience? [Open end]

P3. Were these challenges addressed? [1=Yes, 2=No]

[If P3=2 ASK P4]
P4. What could the program have done to address the challenges you experienced? [OPEN END]

P5. [If returning distributor = Yes] In the most recent program year (ending May 2014), BILD program implementation was transitioned to a new firm, DNV GL. In your opinion, how does the program compare to previous program years now that there is a new program implementer? [1=BETTER, 2= WORSE, 3=THE SAME]

[IF P5=2 ASK P6, ELSE SKIP TO P7]
P6. Can you explain why you think the program has gotten worse?

P7. Other than the BILD program, are you familiar with any of these other programs offered by ComEd? (check all that apply):

1. Standard Incentives
2. Custom Incentives
3. Retrocommissioning
4. Industrial Systems/Process
5. Data Centers
6. New Construction
7. Residential Programs
8. Smart Ideas Opportunity Assessments
9. Residential Lighting
98. I am not aware of ComEd's other programs

[IF P7=98 THEN SKIP OUT OF PROCESS SECTION]

P8. How did you learn about these programs? [multiple response]

1. Smart Ideas Program Staff
2. ComEd's Website
3. Colleague/friend/word of mouth
4. Bill insert
5. Mailing
6. Advertising
7. My organization previously participated in ComEd's other energy efficiency program(s)
0. Other [Specify]

[IF P8 = 7 THEN ASK P9 ELSE P10]

P9. Was your decision to participate in BILD a result of your past experience in these other ComEd programs? [1=Yes, 2=No]

P10. Do you communicate information about these programs to your customers? [1=Yes, 2=No]

[IF P10=2 ASK P11]
P11. Why not? [open end]

EISA 2007 Legislation

19. In 2007, Congress passed a law (EISA) to set higher energy standards for light bulbs. The law phases out 40 to 100 watt standard incandescent light bulbs over a three year period which began in January of 2012. The new laws also affect reflector lamps, general service fluorescent lamps and some decorative bulbs. How familiar do you think your customers are with these new light bulb standards? [Very familiar, Somewhat familiar, Slightly, Not at all Familiar]

a. [If Q19 is 1,2,3] Please describe any changes to the bulbs you stock and sell as a result of these new standards? Are you stocking more:

CFLs
LEDs
Efficient incandescent or halogen bulbs
Other - specify

b. [If Q0 is 1,2,3] What are most of your customers purchasing instead of the discontinued standard 40 to 100 watt incandescent lamps? [MULTIPLE RESPONSE]

CFLs
LEDs
Efficient incandescent or halogen bulbs
Other, please specify

c. [If Q0 is 1,2,3] Using a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant, how significantly have the EISA 2007 standards affected your organizations sales of lighting products?

d. [If Q0 > 7] Please explain the affect the EISA 2007 standards have had on your organizations sales of lighting products?

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

That concludes the survey. In the event that we have questions about your responses, we may need to call you for a brief (5 – 10 minute) follow up phone call.

Is there a best time or day of the week to reach you?
What is the best phone number to reach you at?

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

7.6.2 PY6 End-User Survey Instrument

PY6 ComEd Business Instant Lighting Discount Program 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 BILD in PY5
CFL_NUM– total number of Screw-in CFLs sold through BILD in PY5
CFL_FLAG – 0/1 flag indicating End User was purchasing CFLs through BILD
LED_NUM – total number of LED bulbs sold through BILD in PY5
LED_FLAG – 0/1 flag indicating End User was purchasing LEDs through BILD
LIN_NUM – total number of Linear FL bulbs sold through BILD in PY5
LIN_FLAG – 0/1 flag indicating End User was purchasing Linear FL through BILD

Definitions – For Interviewer Training

Spiral CFL Bulbs – ENERGY STAR qualified CFL bulbs that DO NOT have special functions such as reflectors/floods, or dimmable/3-way light levels.

Specialty CFL Bulbs - ENERGY STAR qualified CFL bulbs that HAVE special functions such as reflectors/floods, globes, high wattage (35W+), dimmable, or 3-way light levels.

Standard LED Lamps – LED A-lamps with >= 55 lumens per watt.

Specialty LED Lamps - Candelabra, globe, and MR lamps with >= 42 lumens per watt. PAR lamps and R lamps with >= 55 lumens per watt. LED trim kits (to convert a recessed down-light from incandescent to LED using an Edison base socket lamps) with >= 42 lumens per watt.

Reduced wattage Linear Fluorescent - Any reduced wattage lamp with a minimum of 80 CRI that can replace a standard lamp and be driven on existing ballast. (T5HO <= 51 watt; T5 <= 26 watt; T8 <= 28 watt. 4' product only designed to operate on existing electronic ballasts).

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 high efficiency light bulbs through ComEd's Business Instant Lighting Discount Program within the last year. This program provided discounts on a wide variety of high efficiency light bulbs sold through lighting distributors in ComEd service territory.

May I speak with [CONTACT_NAME] or the person at [EU_ORG/your organization] that is most knowledgeable about your company's 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]

[ASK IF C1=2]
C1a. Does your business receive electricity delivery services from ComEd? [If necessary, read "Some businesses in this region purchase their electricity from a Retail Electric Supplier but ComEd still provides delivery services."]

1. (Yes, ComEd)
2. (No, Someone Else) [THANK AND TERMINATE]
8. (Don't know) [THANK AND TERMINATE]
9. (Refused) [THANK AND TERMINATE]

READ "During this survey we have a few questions for you about the discounted high efficiency light bulbs you purchased from [DISTRIBUTOR] through the Business Instant Lighting Discount program. From now on we will refer to this program as the BILD program. We will be focusing our questions on CFLs, LEDs, and reduced wattage Linear Fluorescent lamps

[**If needed:** "**Standard CFLs** are made with a glass tube bent into a spiral, resembling soft-serve ice cream and fit in a regular light bulb socket. **Specialty CFLs** have special functions or features such as reflectors, dimmability, three-way lighting levels, or flood lighting"]

[**If needed:** "**LED**s are efficient lighting products that often mimic the look and feel of standard and specialty incandescent bulbs and can fit in a regular light bulb socket. These bulbs are usually more efficient that CFLs and often avoid many of the undesirable product features of CFLs such as color temperature, slow start up, and the spiral shape."]

[**If needed:** "**Reduced Wattage Linear Fluorescents** are similar to standard linear fluorescents in physical appearance and light output. Reduced wattage linear fluorescents simply operate at a lower wattage than standard bulbs. For instance, a standard efficiency 32 watt LF is often replaced by a 28 watt reduced wattage LF."]

C3. According to our records, between June 1, 2013 and May 31, 2014 your organization purchased approximately [TOTAL_BULBS] discounted high efficiency light bulbs from [DISTRIBUTOR]. This included [IF CFL_num > 0 Read: "(CFL_num) CFLs"], [If LIN_NUM > 0 then Read: "(LIN_NUM) reduced wattage Linear Fluorescents lamps", and [If LED_NUM > 0 then Read: ") LED_NUM) LEDs"]. Does this sound correct?

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

[ASK C4_CFL IF C3 = 2 and CFL_NUM > 0]
C4_CFL. How many discounted **screw-in CFLs** would you estimate you purchased from [DISTRIBUTOR] between June 1, 2013 and May 31, 2014?

[NUMERIC OPEN END; 98 = DK; 99 = REF] [Numeric open end = CFL_num; CFL_user_update_flag = 1]

[ASK C4_LED IF C3 = 2 and LED_NUM > 0]
C4_LED. How many discounted **LEDs** would you estimate you purchased from [DISTRIBUTOR] between June 1, 2013 and May 31, 2014?

[NUMERIC OPEN END; 98 = DK; 99 = REF] [Numeric open end = LED _num; LED _user_update_flag = 1]

[ASK C4_LIN IF C3 = 2 and LIN_NUM > 0]
C4_LIN. How many discounted **Reduced Wattage Linear Fluorescents** would you estimate you purchased from [DISTRIBUTOR] between June 1, 2013 and May 31, 2014?

[NUMERIC OPEN END; 98 = DK; 99 = REF] [Numeric open end = LIN _num; LIN_user_update_flag = 1]

[IF C3 = 2 and Sum of (C4_CFL + C4_LED + C4_LIN) = 0 then Thank and Terminate]

[CALCULATE "BULBTYPE" which is the bulbtype that will be asked about for the remainder of the survey where there are series of questions for all bulb type (N31-N53 series)
IF respondent has verified linear fluorescents BULB TYPE=LINEAR FLUORESCENTS
If respondent does not have linear fluorescents than we ask about either LEDs or CFLs – whichever has the larger quantity
BULBTYPE
1 – CFLs
2 – LEDs
3 - Linear Fluorescents

C3a. Did you purchase these bulbs for use at: [READ]

1. <address>/EU_ORG
2. [If addresss] a different address owned by the same company/[If no address] a different business or location owned by the same company
3. for resale or installation for a third party
0. other [Specify]
8. (Don't know)
9. (Refused)

C3b. Are you a contractor?
1. Yes
2. No
8. (Don't know)
9. (Refused)

[If C3a = 3 and C3b= 2] then ASK C3c ELSE Skip C5
C3c. Please describe the nature of your business [OPEN END]

C5. At the time of purchase, were you aware that these bulbs you purchased from [DISTRIBUTOR] were discounted?
1. (Yes – knew all were discounted)
2. (Yes knew SOME were discounted, but not all)
3. (No – didn't know ANY were discounted) [SKIP TO C7a]
8. (Don't know) [SKIP TO C7a]
9. (Refused) [SKIP TO C7a]

[If C5 = 2 and CFL_Flag + LIN_flag + LED_Flag > 1 then ask C5a]
C5a. Which bulb types did you know were discounted? [MULTIPLE RESPONSE] [PROBE IF NEEDED]
1. (CFLs)
2. (LEDs)
3. (Linear FL)
0. (Other, specify)
8. (Don't Know)
9. (Refused)

[ASK IF C5=1 or 2, ELSE SKIP TO C7a]
C6. Did you know this discount was provided by ComEd?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[IF CFL_NUM> 0 ask C7a]
C7a. Prior to June 1, 2013 had you ever purchased **screw-in CFLs**?
1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[IF LIN_NUM > 0 ask C7b]
C7b. Prior to June 1, 2013 had you ever purchased **Reduced Wattage** **Linear Fluorescent** bulbs?

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

[**IF CUSTOMER DOESN'T KNOW DIFFERENCE BETWEEN REDUCED WATTAGE and STANDARD EFFICIENCY LINEAR FL Read:** "Reduced wattage Linear Fluorescents are similar to standard linear fluorescents in physical appearance and light output. Reduced wattage linear fluorescents simply operate at a lower wattage than standard bulbs and use less energy. For instance, a standard efficiency 32 watt LF is often replaced by a 28 watt reduced wattage LF."]

[IF LIN_NUM > 0 then ask C7b1]

C7b1. Since June 1, 2013 have you purchased any STANDARD efficiency linear fluorescents?

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

[IF C7b1 = 1 then ask C7b2 and C7b3]

C7b2. What percentage of the linear fluorescent bulbs you have purchased since June 1, 2013 would you estimate have been reduced wattage versus standard efficiency linear fluorescent lamps?

1. (Other, specify)
2. (Don't Know)
3. (Refused)

C7b3. Why you have purchased both standard and reduced wattage linear fluorescents?

1. (Other, specify)
8. (Don't Know)
9. (Refused)

[IF LED_NUM >0 ask C7c]

C7c. Prior to June 1, 2013 had you ever purchased **LEDs**?

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

Business as Usual Section

BAU1. If the BILD program were not available, please describe in your own words the process your organization typically uses to purchase light bulbs. Specifically,:

BAU1a: Where do you typically purchase light bulbs? [OPEN END]
BAU1b: How do you choose where to purchase your light bulbs from? [OPEN END]
BAU1c: How frequently do you purchase light bulbs? [[OPEN END]
BAU1d: How do you decide what type of bulbs to purchase (PROBE FOR WATTAGE, MODEL, EFFICIENCY LEVEL)? [OPEN END]

BAU2. Do you typically replace light bulbs at your facility upon burn out or based on a replacement schedule?

1. Upon burn out

2. Based on a replacement schedule
0. Other (specify)
8. (Don't know)
9. (Refused)

BAU3. What level of back stock do you typically have on hand (as a percentage of total fixtures on site)?
1. 0 -10%
2. 10 – 25%
3. 25 – 50%
4. 50 – 75%
5. 75 – 100%
6. > 100%
8. (Don't know)
9. (Refused)

BAU4. Does your company have any formal sustainability or green practices, policies, or accreditations such as LEED certification, energy education programs, recycling, or composting?
1. Yes
2. No
8. (Don't know)
9. (Refused)

[ASK IF BAU4=1]
BAU4b. Please describe the sustainability or green practices, policies, or accreditations that your company has in place. **[OPEN END]**

BAU5. How interested would you say your organization is with sustainability issues, such as energy and water conservation, waste diversion, and renewable energy? Please use a scale from 0 to 5 where 0 is 'Not at all interested' and 5 is 'Extremely interested. **[SCALE 0-5, 8=DON'T KNOW, 9=REFUSED]**

BAU6. Is it a priority for your organization to purchase energy efficient equipment, such as ENERGY STAR certified products?
1. Yes
2. No
8. (Don't know)
9. (Refused)

Self-Report Free-Ridership

[ASK FR1 IF C5 = 1 or 2, ELSE SKIP TO FR1a]
FR1. How did you first find out about the price discounts offered by [DISTRIBUTOR] on high efficiency light bulbs? (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)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

FR1a. In the past year have you come across any informational materials from ComEd explaining the energy saving benefits of CFLs, reduced wattage Linear Fluorescents or LEDs? (PROBE For which bulb types - CFLs, LEDs or Linear Fluorescents) (ACCEPT MULTIPLES)

1. (Yes – for CFLs)
2. (Yes – for Linear FL)
3. (Yes – for LEDs)
6. (No)
8. (Don't know)
9. (Refused)

[ASK FR1b IF FR1a = 1 or 2 or 3, ELSE SKIP TO N2]
FR1b. Where did you first see this material? (DO NOT READ) (IF RESPONDENT SAYS "SAW MATERIALS IN STORE" PROBE FOR WHERE IN STORE)

1. (A [DISTRIBUTOR] employee made me aware of the energy savings benefits of high efficiency bulbs)
2. (On Sales Counter)
3. (In Store - general)
4. (Bill insert)
5. (Mailing – non-specific)
6. (Brochure)
7. (Online)
8. (Email)
9. (Tradeshow/seminar)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

[SKIP IF C5=3,8,9]
N2. Did your company make the decision to purchase high efficiency bulbs before or after you became aware of the discount offered by ComEd for the purchase of high efficiency bulbs?

1. Before
2. After
0. (Both…before for some bulbs and after for other bulbs, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

READ "Next, I'm going to ask you to rate the importance of ComEd's discount lighting program and other factors on your decision to purchase high efficiency bulbs from [DISTRIBUTOR] over the past year. Think of the degree of importance on a scale from 0 to 10, where 0 means not at all important and 10 means extremely important.

[ASK IF BULBTYPE=1, ELSE SKIP TO N32]
N31. Regarding your decision to purchase **CFLs** instead of a less efficient alternative bulb type, please rate the importance of the following factors… **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

N31a. The availability of the program discount of $1.00 per bulb for Standard CFLs?

N31a2. The availability of the program discount of $3.00 per bulb for Specialty CFLs?
N31b. A recommendation from a [DISTRIBUTOR] salesperson?
N31c. Your previous experience with CFLs?

N31d. Has your organization previously participated in a ComEd lighting discount program? (IF YES, PROBE FOR WHICH PROGRAM(S))

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

N31e. [ASK If N31d = 1, ELSE SKIP TO N31f] On a scale from 0 to 10, how important was this prior ComEd program experience on your decision to purchase screw-in CFLs instead of a less efficient bulb type? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important)

N31f. [ASK IF FR1A = 1, ELSE SKIP TO N31g] How important were the informational materials from ComEd on the benefits of CFLs? (IF NEEDED: On a scale from 0 to 10, where 0 means not at all important and 10 means extremely important)

N31g. Are screw-in CFLs standard practice in your industry?

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

N31h. [ASK IF N31g = 1, ELSE SKIP TO N31i] On a scale from 0 to 10, how important was this industry standard on your decision to purchase CFLs instead of a less efficient bulb type? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important) **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

N31i. Does your organization have a policy, formal or informal, requiring the purchase of high efficiency lighting?

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

N31j. [ASK IF N3li=1] On a scale from 0 to 10, how important was this policy on your decision to purchase CFLs instead of a less efficient bulb type? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important) **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**
[ASK If BULBTYPE=2, ELSE SKIP TO N33]
N32. Please rate the importance of the following factors on your decision to purchase **Reduced Wattage Linear Fluorescents** rather than standard efficiency linear fluorescents from [DISTRIBUTOR] over the past year…
[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]

N32a. The availability of the program discount of $1 per bulb?

N32b. A recommendation from a [DISTRIBUTOR] salesperson?
N32c. Your previous experience with reduced wattage Linear Fluorescents?

N32d. Has your organization previously participated in a ComEd lighting discount program? (IF YES, PROBE FOR WHICH PROGRAM(S))

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

N32e. [ASK If N32d = 1] On a scale from 0 to 10, how important was this prior ComEd program experience on your decision to purchase reduced wattage linear fluorescents? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important) **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

N32f. [ASK IF FR1A=2, ELSE SKIP TO N32g] How important were the informational materials from ComEd on the benefits of reduced wattage Linear Fluorescents? (IF NEEDED: On a scale from 0 to 10, where 0 means not at all important and 10 means extremely important)

N32g. Are reduced wattage linear fluorescent lamps standard practice in your industry?

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

N32h. [ASK IF N32g = 1] How important was this industry standard on your decision to purchase reduced wattage linear fluorescents? (IF NEEDED: On a scale from 0 to 10, where 0 means not at all important and 10 means extremely important)

N32i. Does your organization have a policy, formal or informal, requiring the purchase of high efficiency lighting?

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

N32j. [If N32i = Yes] On a scale from 0 to 10, how important was this policy on your decision to purchase reduced wattage linear fluorescents lamps? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important) **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

[ASK If BULBTYPE=3, ELSE SKIP TO N41]
N33. Please rate the importance of the following factors on your decision to purchase **LEDs** instead of a less efficient alternative bulb type from [DISTRIBUTOR] over the past year... **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

N33a. The availability of the program discount of $8 to $13 per bulb
N33b. A recommendation from a [DISTRIBUTOR] salesperson
N33c. Your organizations previous experience with LEDs

N33d. Has your organization previously participated in a ComEd lighting discount program? (IF YES, PROBE FOR WHICH PROGRAM(S))

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

N33e. [ASK If N33d = 1, ELSE SKIP TO N33F] On a scale from 0 to 10, how important was this prior ComEd program experience on your decision to purchase LEDs instead of a less efficient bulb type? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important)

N33f. **[ASK IF FR1A =3, ELSE SKIP TO N33g]** How important were the informational materials from ComEd on the benefits of high efficiency LEDs? (IF NEEDED: On a scale from 0 to 10, where 0 means not at all important and 10 means extremely important)

N33g. Are LEDs standard practice in your industry?

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

N33h. [ASK IF N33g = 1] On a scale from 0 to 10, how important was this industry standard on your decision to purchase LEDs instead of a less efficient bulb type? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important)

N33i. Does your organization have a policy, formal or informal, requiring the purchase of high efficiency lighting?

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

N33j. [If N33i = 1] On a scale from 0 to 10, how influential was this policy on your decision to purchase LEDs instead of a less efficient bulb type? (IF NEEDED: With 0 meaning not at all important and 10 meaning extremely important) **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

[ASK If BULBTYPE=1]

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 ComEd's discount lighting program in your decision to purchase **CFLs** instead of a less efficient alternative bulb type from [Distributor]?
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK If BULBTYPE=2]
N42. Using a 0 to 10 scale, with 0 being not at all important and 10 being very important, please rate the overall importance of ComEd's discount lighting program in your decision to purchase **reduced wattage Linear Fluorescents** rather than standard efficiency linear fluorescents from [Distributor]?
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK If BULBTYPE=3]
N43. Using a 0 to 10 scale, with 0 being not at all important and 10 being very important, please rate the overall importance of ComEd's discount lighting program in your decision to purchase **LEDs** instead of a less efficient alternative bulb type from [Distributor]?
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK If BULBTYPE=1]
N51. Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, what is the likelihood that you would have purchased the same number of **screw-in CFLs** from [DISTRIBUTOR] if ComEd's discount lighting program had NOT BEEN AVAILABLE and you had to pay full price for these bulbs?
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK If BULBTYPE=2]
N52. Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, what is the likelihood that you would have purchased the same number of **reduced wattage Linear Fluorescents** from [DISTRIBUTOR] if ComEd's discount lighting program had NOT BEEN AVAILABLE and you had to pay full price for these bulbs?
[RECORD 0-10; 98 = DK; 99 = REF]

[ASK If BULBTYPE=3]
N53. Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, what is the likelihood that you would have purchased the same number of **LEDs** from [DISTRIBUTOR] if ComEd's discount lighting program had NOT BEEN AVAILABLE and you had to pay full price for these bulbs?
[RECORD 0-10; 98 = DK; 99 = REF]

CONSISTENCY CHECKING
[ASK IF N31A=6-10 AND N51=6-10]
CC1a. When you answered ...<N31A> out of 10... for the question about the influence of the discount, I would interpret that to mean that the rebate was quite important to your decision to purchase **screw-in CFL**s from [DISTRIBUTOR]. Then, when you answered, <N51> out of 10 for how likely you would be to purchase the same CFLs without the discount, it sounds like the discount 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 discount played in your decision to purchase screw-in CFLs from [DISTRIBUTOR]?
[OPEN END; 98 = DK; 99 = REF]

CC1b. Would you like for me to change your score on the importance of the discount that you gave a rating of <%N31A> and/or change your rating on the likelihood you would purchase the same **CFLs** without the discount which you gave a rating of <%N51> and/or we can change both if you wish?
[OPEN END; 98 = DK; 99 = REF]

[ASK IF N32A=6-10 AND N52=6-10]
CC2a. When you answered ...<N32A> out of 10... for the question about the influence of the discount, I would interpret that to mean that the rebate was quite important to your decision to purchase **reduced wattage Linear Fluorescent** bulbs from [DISTRIBUTOR]. Then, when you answered…<N52> out of 10 for how likely you would be to purchase the same linear fluorescents without the discount, it sounds like the discount 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 discount played in your decision to purchase linear fluorescents from [DISTRIBUTOR]?
[OPEN END; 98 = DK; 99 = REF]

CC2b. Would you like for me to change your score on the importance of the discount that you gave a rating of <%N32A> and/or change your rating on the likelihood you would purchase the same **reduced wattage Linear Fluorescent** without the discount which you gave a rating of <%N52> and/or we can change both if you wish?
[OPEN END; 98 = DK; 99 = REF]

[ASK IF N33A=6-10 AND N53=6-10]
CC3a. When you answered ...<N33A> out of 10... for the question about the influence of the discount, I would interpret that to mean that the rebate was quite important to your decision to purchase **LEDs** from [DISTRIBUTOR]. Then, when you answered..<N53> out of 10 for how likely you would be to purchase the same LEDs without the discount, it sounds like the discount 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 discount played in your decision to purchase LEDs from [DISTRIBUTOR]?
[OPEN END; 98 = DK; 99 = REF]

CC3b. Would you like for me to change your score on the importance of the discount that you gave a rating of <%N33A> and/or change your rating on the likelihood you would purchase the same **LEDs** without the discount which you gave a rating of <%N53> and/or we can change both if you wish?
[OPEN END; 98 = DK; 99 = REF]

YR5 Install Rate Battery

[ASK IF BULBTYPE=1, ELSE SKIP TO LINEAR FL INSTALL BATTERY]
CFL INSTALL BATTERY
For the next set of questions I'd like you to think about the [CFL_NUM] screw-in CFLs that you purchased from [DISTRIBUTOR] between June 2013 and May 2014.

P1a. Prior to purchasing these < *CFL_NUM*> screw-in CFLs, were you … (READ LIST)
1. Very familiar
2. Somewhat familiar or
3. Not at all familiar with CFLs
8. (Don't know)
9. (Refused)

[ASK If QC3a = 3]
IN1a. Does your organization install the program bulbs you purchased for your clients or do your clients install the bulbs themselves?
1. (We/ My organization installs bulbs)
2. (Clients Install)
3. (A mix of both)
8. (Don't know)

9. (Refused)

[IF IN1A=2 THEN SKIP TO BUS]
G1a. What percentage of these <CFL_NUM> CFLs would you estimate have been installed? (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)

G2a. In the majority of instances, what type of bulbs did the new CFL(s) replace? Would you say they replaced…

1. All Incandescents
2. Mostly Incandescents
3. All CFLs
4. Mostly CFLs
5. Half Incandescents and Half CFLs
6. Halogens
7. A mixture of bulb types
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

G3a. Are all of these CFLs still installed or have some been removed?

1. (All still in place)
2. (Removed some)
3. (Removed all)
8. (Don't know)
9. (Refused)

[ASK G4a IF G3a = 2]
G4a. What percentage of installed CFLs would you estimate have been removed? (DO NOT READ)

1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)
7. (1-9%)
0. (Other Specify)
8. (Don't know)

9. (Refused)

[Ask G5a IF G3a = 2 OR 3]
G5a. 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 bulb to another location)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK G6a IF G1a <> 1, <> 98, AND <> 99]
G6a. Where are the screw-in CFLs 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)
8. (Installed Elsewhere but not in residential location)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

[ASK IF BULBTYPE=2, ELSE SKIP TO LED INSTALL BATTERY]
LINEAR FL INSTALL BATTERY
For the next set of questions I'd like you to think about [LIN_NUM] reduced wattage Linear fluorescent lamps that you purchased from [DISTRIBUTOR] between June 2013 and May 2014.

P1b. Prior to purchasing these < *LIN_NUM*> reduced wattage Linear Fluorescent lamps, were you … (READ LIST)

1. Very familiar
2. Somewhat familiar
3. Not at all familiar with reduced wattage Linear Fluorescent lamps
8. (Don't know)
9. (Refused)

[ASK If QC3a = 3]
IN1b. Does your organization install the program bulbs you purchased for your clients or do your clients install the bulbs themselves?

1. (We/My organization installs the bulbs)
2. (Clients Install)
3. (A mix of both)
8. (Don't know)
9. (Refused)

G1b. [IF IN1B=2 THEN SKIP TO BUS] What percentage of these < *LIN* _NUM> Linear fluorescent lamps would you estimate have been installed? (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)

G2b. In the majority of instances, what type of lamps did the new linear fluorescent(s) replace? Would you say they replaced…

1. All standard linear fluorescents
2. Mostly standard linear fluorescents
3. All reduced wattage linear fluorescents
4. Mostly reduced wattage linear fluorescents
5. T12s
6. A mixture of bulb types
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

G3b. Are all of these linear fluorescent bulbs still installed or have some been removed?

1. (All still in place)
2. (Removed some)
3. (Removed all)
8. (Don't know)
9. (Refused)

[ASK G4b IF G3b = 2]
G4b. What percentage of installed Linear fluorescent would you estimate have been removed? (DO NOT READ)

1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)

6. (10-19%)
7. (1-9%)
0. (Other Specify)
8. (Don't know)
9. (Refused)

[Ask G5b IF G3b = 2 OR 3]
G5b. Why did you remove the linear fluorescent bulbs? (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. (Moved bulb to another location)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK G6b IF G1b<> 1, <> 98, AND <> 99]
G6b. Where are the Linear fluorescent lamps 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)
8. (Installed Elsewhere, but not into a residential location)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

[ASK IF BULBTYPE=3, ELSE SKIP TO BUS]
LED INSTALL BATTERY
For the next set of questions I'd like you to think about the [LED_NUM] LEDs that you purchased from [DISTRIBUTOR] between June 2013 and May 2014

P1c. Prior to purchasing these <*LED_NUM*> LEDs, were you … (READ LIST)

1. Very familiar
2. Somewhat familiar
3. Not at all familiar with LEDs
8. (Don't know)
9. (Refused)

[ASK If QC3a = 3]

IN1C. Does your organization install the program bulbs you purchased for your clients or do your clients install the bulbs themselves?

1. (We/My organization installs the bulbs)
2. (Clients Install)
3. (A mix of both)
8. (Don't know)
9. (Refused)

[IF IN1C=2 THEN SKIP TO BUS]

G1c. What percentage of these <LED_NUM> LEDs would you estimate have been installed? (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)

G2c. In the majority of instances, what type of bulbs did the new LED(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 bulb types
8. LEDs
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

G3c. Are all of these LEDs still installed or have some been removed?

1. (All still in place)
2. (Removed some)
3. (Removed all)
8. (Don't know)
9. (Refused)

[ASK G4c IF G3c = 2]

G4c. What percentage of installed LEDs would you estimate have been removed? (DO NOT READ)

1. (100%)
2. (90-99%)

3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)
7. (1-9%)
0. (Other Specify)
8. (Don't know)
9. (Refused)

[Ask G5c IF G3c = 2 OR 3]
G5c. Why did you remove the LEDs(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 bulb to another location)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK G6c IF G1c<> 1, <>98, and <>99]
G6c. Where are the LEDs 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)
8. (Installed elsewhere, but not in a residential location)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

APT1. What is the main business activity of the location where the reduced wattage bulbs you purchased from [DISTRIBUTOR] will be installed? [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. (High School/Middle School)
11. (Elementary School)
12. (College/University)
13. (Garage)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

[ASK IF BUS = 2 or 5 and BULBTYPE = 1]
APT1a. Will the screw-in CFLs primarily be installed in …

1. A Private Space such as a tenants unit
2. In a Common Space, such as a Hallway, Stairs or Lobby
3. In An Exterior Location
   0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK IF BUS = 2 or 5 and BULBTYPE = 2]
APT1b. Will the Linear Fluorescents primarily be installed in …

1. A Private Space such as a tenants unit
2. In a Common Space, such as a Hallway, Stairs or Lobby
3. In An Exterior Location
   0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK IF BUS = 2 or 5 and BULBTYPE = 3]
APT1c. Will the LEDs primarily be installed in …

1. A Private Space such as a tenants unit
2. In a Common Space, such as a Hallway, Stairs or Lobby
3. In An Exterior Location
   0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

Leak. To the best of your knowledge, will any of the high efficiency bulbs you purchased from [DISTRIBUTOR] be installed <u>outside</u> of ComEd service territory?

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

[ASK Leak2 IF Leak = 1]
Leak2. What percentage of these high efficiency bulbs would you estimate will be installed outside of ComEd service territory?

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

[ASK if C3B = 1, ELSE SKIP TO SO1]
CONT1. Does your company have clients outside of ComEd's service territory? [If needed, ComEd serves the Chicago and Northern Illinois area. The service territory roughly borders interstate 80 to the south, the Wisconsin border to the north, the Iowa border to the west, and the Indiana border to the east.]

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

[ASK If LEAK = 2 and CONT1 = 1]
CONT1a. You have stated that while you do have clients outside of ComEd's service territory, you haven't installed any program discounted bulbs in those locations. Is this correct?

1. (Yes)
2. (No, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

CONT2. Do you purchase bulbs for specific projects or do you keep stock on hand which you then sell to any one of your clients?

1. (Specific projects)
2. (Stock on hand)
3. (Other – Specify) [OPEN END]
8. (Don't know)
9. (Refused)

CONT3. How do you decide whether to install standard or high efficiency bulbs? (DO NOT READ LIST) [MULTIPLE RESPONSE]

1. (My company typically installs standard efficiency lamps)
2. (My company typically installs high efficiency lamps)
3. (Based on client request)
4. (Based on what I need (type, wattage))
5. (Based on price)
6. (Based on what is on Sale)
7. (Based on availability in the store)
8. (Based on the bulb type already in the fixture)
9. (Based on sales rep or other recommendation)
10. (Based on what we have in stock)
    0. (Other, Specify) [OPEN END]

98. (Don't know)99. (Refused)

CONT4. Using a 0 to 10 scale, with 0 being not at all influential and 10 being very influential, how much influence would you say you have on the client's decision to install standard efficiency versus high efficiency lamps? [SCALE 0-10; 98=(DON'T KNOW); 99=(REFUSED)]

CONT5. Do you promote BILD program bulbs to your clients?

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

[ASK IF CONT5 = 1, ELSE SKIP TO SO1]
CONT5a. Do you share ComEd product buying guides/educational materials with your clients?

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

CONT5b. Do you pass the ComEd incentive along to your clients?

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

Self-Report Spillover

SO1. In the time since you purchased the discounted high efficiency light bulbs from [DISTRIBUTOR] has your organization purchased [IF IN1A, IN1B, IN1C <> 2 READ "and installed"] any other efficient lighting products for your business [IF C3a=3 READ "or for your customers"] at regular retail price, without any discounts?

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

[If SO1 = 1 READ "I would like to learn more about the types of non-discounted high efficiency light bulbs you purchased in the past year**"; ELSE SKIP TO P4]**

SO1a. Have you purchased any non-discounted **Standard CFLs**? [If needed: "Standard CFLs are made with a glass tube bent into a spiral, resembling soft-serve ice cream and fit in a regular light bulb socket."]

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

SO1b. Did you purchase any non-discounted **Specialty CFLs**? [If needed: "Specialty CFLs have special functions or features such as reflectors, dimmability, three-way lighting levels, or flood lighting"]

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

SO1c. Did you purchase any non-discounted **Reduced Wattage Linear Fluorescent** bulbs? (IF NEEDED: reduced wattage Linear Fluorescents are similar to standard linear fluorescents in physical appearance and light output. Reduced wattage linear fluorescents simply operate at a lower wattage than standard bulbs. For instance, a standard efficiency 32 watt LF is often replaced by a 28 watt reduced wattage LF)

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

SO1d. Did you purchase any non-discounted **LED** bulbs?

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

[ASK SO2a IF SO1a = 1]

SO2a. Approximately how many non-discounted **Standard CFLs** would you estimate have been purchased for your business [IF C3a=3 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?

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

[ASK SO2b IF SO1b = 1]

SO2b. Approximately how many non-discounted **Specialty CFLs** would you estimate have been purchased for your business [IF C3a=3 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?

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

[ASK SO2c IF SO1c = 1]

SO2c. Approximately how many non-discounted **Reduced Wattage Linear Fluorescent** bulbs would you estimate have been purchased for your business [IF C3a=3 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?

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

[ASK SO2d IF SO1d = 1]

SO2d. Approximately how many non-discounted **LEDs** would you estimate have been purchased for your business [IF C3a=3 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?

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

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 organization's experience with the discounted bulbs purchased through ComEd's program influenced our decision to install more efficient lighting products outside the program.

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

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)
2. (The discounted bulbs had sold out)
3. (The type of bulbs I needed were not discounted)
4. (Preferred a brand/package that was not discounted)
5. (I bought the lighting at a store that did not have the price discounted bulbs)
6. (The incentive wasn't big enough to influence my purchase)

0. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

Process and 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 discounted light bulbs you purchased from [DISTRIBUTOR] between June 2013 and May 2014?
[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)

0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

Purch1. When selecting bulbs for your business [IF C3a=3 include "or for your customers"], 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. (I typically buy LEDs)
4. (I typically buy Linear Fluorescent bulbs)
5. (Based on what I need (type, wattage))
6. (Based on price)
7. (Based on what is on Sale)
8. (Based on availability in the store)
9. (Based on Energy Efficiency)
10. (Based on the bulb type already in the fixture)
11. (Based on sales rep or other recommendation)

00. (Other) [OPEN END] (RECORD VERBATIM)
98. (Don't know)
99. (Refused)

OT1. Have any regular screw-in incandescent bulbs been purchased for your business [IF C3a=3 include "or for your customers"] since June of 2013?

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

OT2. Have any **standard** efficiency linear fluorescent bulbs, such as a 32 Watt Linear Fluorescent rather than a reduced wattage 28 Watt bulb, been purchased for your business [IF C3a=3 include "or for your customers"] since June of 2013,?

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

[ASK CFLBAR1-CFLBAR7 IF OT1 = 1]

CFLBar1-7. I'm going to read you a short list of reasons why you might have purchased incandescent bulbs instead of CFLs for your business [IF C3a=3 include "or for your customers"]. 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]

CFLBar1. Higher price for CFLs
CFLBar2. Dissatisfaction with past CFLs
CFLBar3. Dissatisfaction withthe way CFLs look in a fixture
CFLBar4. Dissatisfaction withthe quality or brightness of light CFLs produce
CFLBar5. Dissatisfaction with mercury content in CFLs
CFLBar6. Inability to find the type of bulb I needed as a CFL

CFLBar7**.** 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]

[ASK LEDBAR1-LEDBAR6 IF OT1 = 1]

LEDBar1-6. Using this same scale please rank how significant the following factors were in your decision to purchase incandescent bulbs instead of LEDs.. [ROTATE LIST]

LEDBar1. Higher price for LEDs
LEDBar2. Unfamiliarity with LED bulbs that replace standard incandescent bulbs
LEDBar3. Dissatisfaction with the way LEDs look in a fixture
LEDBar4. Dissatisfaction with quality or brightness of light LEDs produce
LEDBar5. Inability to find the type of bulb I needed as a LED

LEDBar6**.** Are there any other factors that were not mentioned that have resulted in you purchasing incandescent bulbs for your business rather than LEDs?
[OPEN END; 98 = DK; 99 = REF]

[ASK LINBAR1-LINBAR4 IF OT2 = 1]

LINBar1-3. I'm going to read you a short list of reasons why you might have purchased standard efficiency linear fluorescent bulbs instead of reduced wattage linear fluorescent for your business [IF C3a=3 include "or for your customers"]. 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]

LINBar1. Higher price for reduced wattage Linear Fluorescent bulbs
LINBar2. Unfamiliarity with reduced wattage Linear Fluorescent bulbs

LINBar3. Are there any other factors that were not mentioned that have resulted in you purchasing standard efficiency linear fluorescent bulbs instead of reduced wattage linear fluorescents for your business?
[OPEN END; 98 = DK; 99 = REF]

[IF LINBar1 > 7 then ask LINBar4]
LINBar4. After the ComEd incentive, the incremental cost of efficient linear fluorescents over standard efficiency linear fluorescents is quite small. Did the sales representative from [Distributor] discuss advantages of efficient linear fluorescent lamps such as longer lifetimes, similar light output, and short payback period?
[OPEN END; 98 = DK; 99 = REF]

[IF LED_NUM = 0 ASK LED1 and LED2]
LED1. Are you familiar with screw-in LED light bulbs that can be used to replace standard screw based light bulbs?

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

[SKIP IF LED1=2]
LED2. Have you ever purchased screw-in LED bulbs for your business [IF C3a=3 include "or for your customers"]?

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

LAW1. As you may be aware, there are new federal light bulb regulations that began in January of 2012. The new regulations are being phased in over 3 years. The first effects require 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". Prior to today, have you heard of these federal light bulb regulations?

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

LAW2. Do you believe these new regulations will impact the lighting products your organization purchases for your business [IF C3a=3 include "or for your customers"]?

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

[ASK LAW3 IF LAW2 = 1]
LAW3. What type of bulbs do you anticipate purchasing to replace the phased out bulbs?

1. (Open End)
8. (Don't know)
9. (Refused)

Firmographics

[Complete this battery if C3a =1 or 2]

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

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

1. Own
2. Lease
3. Manage
8. (Don't know)
9. (Refused)

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

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

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

1. Screw-in Bulbs (CFLs, Incandescents, LEDs)
2. Linear FL
3. HighBay Lighting
4. Metal Halide
0. (Other Specify)
8. (Don't know)
9. (Refused)

F4. Approximately what percentage of your monthly electricity bill is due to lighting?

1. (Open End)
8. (Don't know)
9. (Refused)

F6. In what year was your facility built? (IF RESPONDENT SAYS "DON'T KNOW" PROBE FOR BEST GUESS)

1. (Open End – record year)
8. (Don't know)
9. (Refused)

FINAL. ComEd is continually looking for ways to enhance its energy efficiency programs. Do you have any suggestions for improving their Business Instant Lighting Discounts Program?

1. (Open End)
96. (No suggestions)
8. (Don't know)
9. (Refused)

END1. Those are all of the questions I have for you today. Thank you very much for your time.

7.6.3 PY6 End-User In-depth Interview Guide

End User In-Depth Interview Guide

This guide outlines the topics that will be covered in the brief interviews that will be conducted with a handful of PY6 End Users. The goal of these interviews is to speak with End Users who purchased large quantities of program LEDs or Linear FL bulbs or are believed to be representative of a group of program purchasers. The primary focus of these interviews is to gather data to do improve the evaluations estimation of NTG for LED and Linear FL bulbs. These interviews will be conducted with both customers who have been previously surveyed in the CATI EU survey and also those who have not yet been surveyed. Those not contacted during the CATI EU surveys will be asked a number of additional questions to verify the quantity of LF and LED program bulbs purchased.

Sample Design

The proposed sample design was determined based on the distribution of bulbs sold to the various business types. As the table below shows, the proposed sample design calls for interviewing 6 LED purchasers and 5 LF purchasers. In total, the 6 business types included in the LED sample make up 77% of the LEDs sold through the program (including those sold through the retail channel which we are unable to include based on the lack of customer information). The 5 business types included in the LF sample make up 74% of the LFs sold through the program (again including those sold through the retail channel which we are unable to include based on the lack of customer information).

Proposed Sample Frame	**Bulb Type Purchased**			
Business Type	**LED Quota**	**%**	**LF Quota**	**%**
Contractor - electric	1	8%	1	7%
Contractor - retrofit	1	11%	2	47%
Retail	1	7%	1	9%
Office	1	13%	1	12%
Condo	1	5%	0	
Hotel	1	9%	0	
Retail Channel	n/a	24%	n/a	0%
Total		77%		74%

Interview Battery Outline

The following outline will be used for all interviews. Some segments (where noted) only apply to those who *have* been previously surveyed (Nested) and other apply only to those *have not* been previously surveyed (Non-nested).

1. Introduction
2. Verification of Bulbs purchased through the BILD program in PY6 (Non-nested)
3. Retrofit Contractor Battery
    a. Explain their Retrofit Contractor business model.

b. Do they operate in other regions where LF/LEDs incentives are not available?

c. Were they selling LF/LEDs prior to the BILD program?

d. Do they promote the ComEd BILD program with their customers? How?

e. How are specific lighting models determined?

f. Describe the impact the BILD program incentives have on their sales of LF and LEDs. Do they sell any standard eff T8s?

g. What types of bulbs are RW T8s/ LEDs are typically being replaced?

h. How many of their verified bulbs sales would they have purchased in the absence of the program?

i. Has the ComEd BILD program in any way ($$ savings, information, etc) led to your customers purchasing other non-discounted EE bulbs?

    i. How? What Type? How Many?

4. Non Retrofit Contractor Battery

    a. Product Selection - LF

        i. How does customer determine which LF product to purchase? (StdEff/RW/HO)

        ii. Has customer noticed differences in light output/quality between standard efficiency T8s and RW T8s?

        iii. Are standard efficiency T8s ever purchased by customer? And if so, why?

        iv. What is primary reason for NOT purchasing RW LF?

    b. Product Selection - LEDs

        i. How does customer determine which MSB lamp to purchase?

        ii. What is primary reason for NOT purchasing LEDs?

    c. Has the ComEd BILD program in any way ($$ savings, information, etc) led to the purchase of other non-discounted EE bulbs?

        i. How? What Type? How Many?

5. NonNested NTG Battery

    a. At the time of these EE LED/LFs were purchased, were you aware that these bulbs were discounted?

    b. If so, did you decide to purchase these EE bulbs before or after you were aware of the discount?

c. What were the most important factors in your decision to purchase these bulbs as opposed to a standard efficiency alternative? (price, energy savings, information, previous experience, corporate policy) – If info/energy savings – was this info from ComEd materials?

d. How important was program in your decision to purchase EE bulbs? (0-10)

e. How likely would you have been to buy these bulbs in the absence of the ComEd program? (0-10)

f. Opened Ended Description of Influence of ComEd Program on their LED or LF lighting purchases.

6. Nested NTG Clarification Battery

a. Clarify any NTG question responses not clear from CATI survey (i.e. - When we talked to you on the phone back in XX you indicated that your organization had made the decision to purchase high efficiency bulbs <u>before</u> becoming aware of the discount offered by ComEd (Qn2). You also stated that that ComEd's discount lighting program was <u>very important</u> in your decision to purchase RW LF rather than Std Eff LF (Qn42). You also ranked your likelihood of purchasing the same # of RW LF from distributor an 8/5 if the discount lighting program had not been available. Could you tell me more in your own words about the role this program played in your decision to buy the EE bulbs from distributor.)

b. Opened Ended Description of Influence of ComEd Program on their LED or LF lighting purchases.

<u>Data Requirements for Interviews</u>

Nested Sample – contact name, organization, phone, listing of bulbs purchased, transactions, distributors, Verified CFLs, Verified LEDs, Verified LFs, Responses to questions

Non-Nested Sample – contact name, organization, phone, listing of bulbs purchased, transactions, distributors