



**Midstream Incentives Program
(a/k/a Business Instant Lighting Discounts)
PY7 Evaluation Report**

FINAL

**Energy Efficiency / Demand Response Plan:
Plan Year 7
(6/1/2014-5/31/2015)**

**Presented to
Commonwealth Edison Company**

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E. Executive Summary

This report presents a summary of the findings and results from the impact and process evaluation of ComEd's program year 7 (PY7)¹ Midstream Incentives program. The primary component of Midstream Incentives covers lighting products and is branded the 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 fluorescent lamps (LF), LF ballasts, and high intensity discharge (HID) lamps sold to business customers. Additionally, LED exit signs were added to the BILD Program offerings in PY7 and commercial battery chargers were offered for the first time in PY7 as part of the Business Products Discounts program. 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 PY7 Midstream Incentives program. Table E-1 also includes verified PY7 net carryover savings. All savings from the Midstream Incentives program are attributable to the EEPs portfolio. The verified gross savings estimate of 229,798 MWh represents a gross realization rate of 92 percent (i.e., verified savings were 92 percent of the ex ante gross savings estimate). Verified savings were lower than ComEd ex ante savings primarily because ex ante estimates do not include a residential / nonresidential split. The IL TRM v3.0 specifies a split of 17 percent residential and 83 percent commercial for CFL and LED lamps and two percent / 98 percent for linear fluorescent lamps. Commercial installations have higher deemed hours of use and interactive effects values than residential installations, so attributing savings to residential installs has a downward impact on savings.

Table E-1. PY7 Total Program Electric Savings

Savings Category	Energy Savings (MWh)	Summer Peak Demand Savings (MW)	Winter Peak Demand Savings (MW)
Ex Ante Gross Savings	251,109	NR*	NR*
Verified Gross Savings	229,798	50.9	42.9
Verified Net Savings	155,239	34.5	29.1
Verified Net Carryover Savings	20,557	4.2	4.0
Verified Total PY7 Net Savings	175,795	38.7	33.0

Source: ComEd tracking data and Navigant team analysis.

* NR = Not reported

¹ The PY7 program year for the Midstream Program began June 1, 2014 and ended January 6, 2015. The program year was scheduled to operate from June 1, 2014 through May 31, 2015; however, the BILD met its goals for PY7 earlier than expected and the program ceased offering BILD services on January 6, 2015.

E.2. Program Savings by Channel and Bulb Type

Table E-2 and Table E-3 summarize the electricity savings from the ComEd PY7 BILD Program by program product type and distribution channel. As these tables show, CFLs made up approximately 20 percent of the total program verified net MWh and net peak MW savings (19 percent and 20 percent, respectively), LEDs accounted for 72 percent of verified net MWh and 73 percent of net peak MW impacts, and linear fluorescent lamps made up approximately seven percent of verified net MWh and five percent of peak MW savings.

There are two line items for LED lamps (TRM v3.0 and TRM v5.0) in Table E-2. This is due to an outdated method in IL TRM v3.0 for estimating the baseline wattage of LED MR and PAR shaped lamps. The TRM v3.0 method consistently overestimates the baseline wattage for these lamp types (first identified in PY5). The IL TRM v4.0 and draft v5.0 have been updated with new and more accurate models.² For ex ante savings, ComEd used the v5.0 methods for these lamps, which resulted in higher savings estimates than the deemed values from v3.0. ComEd, the evaluation team and the IL Stakeholder Advisory Group (SAG) reviewed this issue and approved the use of the updated methods (e.g., use of TRM v5.0) for PY7 verified savings estimates in this report on December 1, 2015. All verified savings estimates presented in this report use the TRM v5.0 method for calculating baseline wattages for LED MR and PAR lamps. The TRM v3.0 entries are presented for comparison purposes only and are not included in the totals.

² Per “Update to Baseline Wattages for Directional Lamps” workpaper submitted by Itron to the Illinois SAG July 29th, 2015.

Table E-2. PY7 Verified Net MWh Impact Savings Estimates by Measure Type

	Ex-Ante Gross MWh Savings	Verified Gross Realization Rate	Verified Gross MWh Savings	NTG Ratio	Verified Net MWh Savings
Retail Channel					
Standard CFLs	11,716	0.91	10,704	0.64	6,851
Specialty CFLs	65	0.92	59	0.64	38
LED Lamps – TRM v3.0*	5,351	0.91	4,853	0.70	3,397
LED Lamps – TRM v5.0	5,351	0.93	4,982	0.70	3,487
LED Fixture	3,944	0.86	3,375	0.70	2,362
Total*	21,076	0.90	18,992	0.67	12,648
Distributor Channel					
Standard CFLs	15,592	0.87	13,512	0.64	8,648
Specialty CFLs	22,563	0.94	21,197	0.64	13,566
LED Lamps – TRM v3.0*	154,414	0.74	114,928	0.70	80,449
LED Lamps – TRM v5.0	154,414	0.85	131,557	0.70	92,090
LED Fixture	13,756	1.4	18,661	0.70	13,063
LED Exit Sign	1,434	2.6	3,659	0.67	2,452
Linear Fluorescent	19,583	1.0	19,265	0.56	10,789
Ceramic Metal Halide (CMH)	623	1.2	750	0.67	503
Ballasts	1,628	1.0	1,635	0.67	1,095
Battery Chargers	441	1.0	441	0.67	295
Total*	230,033	0.92	210,678	0.68	142,500
Retail and Distributor Channels					
Total*	251,109	0.92	229,798	0.68	155,239

Source: ComEd tracking data and Navigant team analysis.

* Totals include "LED Lamps – TRM v5.0." Results for LED Lamps using TRM v3.0 are presented for comparison purposes only.

Table E-3. PY7 Verified Net Peak MW Impact Savings Estimates by Measure Type

	Verified Gross Summer Peak MW Savings	Verified Gross Winter Peak MW Savings	NTG Ratio [†]	Verified Net Summer Peak MW Savings	Verified Net Winter Peak MW Savings
Retail Channel					
Standard CFLs	2.5	2.1	0.64	1.6	1.4
Specialty CFLs	0.0	0.0	0.64	0.0	0.0
LED Lamps – TRM v3.0*	1.1	1.0	0.70	0.8	0.7
LED Lamps – TRM v5.0	1.2	1.0	0.70	0.8	0.7
LED Fixture	0.6	0.5	0.70	0.4	0.3
Total*	4.3	3.6	0.66	2.8	2.4
Distributor Channel					
Standard CFLs	3.2	2.7	0.64	2.0	1.7
Specialty CFLs	5.0	4.2	0.64	3.2	2.7
LED Lamps – TRM v3.0*	27.2	22.9	0.70	19.0	16.0
LED Lamps – TRM v5.0	31.1	26.2	0.70	21.8	18.3
LED Fixture	3.1	2.6	0.70	2.2	1.8
LED Exit Sign	0.5	0.5	0.67	0.3	0.3
Linear Fluorescent	3.3	2.7	0.56	1.8	1.5
CMH	0.1	0.1	0.67	0.1	0.1
Ballasts	0.3	0.2	0.67	0.2	0.2
Battery Chargers	0.1	0.1	0.67	0.0	0.0
Total*	46.6	39.3	0.68	31.7	26.7
Retail and Distributor Channels					
Total*	50.9	42.9	0.68	34.5	29.1

Source: ComEd tracking data and Navigant team analysis.

[†] A deemed value. Source: ComEd_NTG_History_and_PY7_Recommendation_2014-02-28_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

* Totals include "LED Lamps – TRM v5.0." Results for LED Lamps using TRM v3.0 are presented for comparison purposes only.

E.3. Impact Estimate Parameters for Future Use

In the course of our PY7 research, the evaluation team did research on parameters used in impact calculations including those in the Illinois TRM. Some of those parameters are eligible for deeming for future program years or for inclusion in future versions of the TRM. The evaluation team's parameters recommended for future use are shown in the following table.

Table E-4. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
Res/Non-Res Split	3.3% / 96.7% CFLs, LEDs 0.5% / 99.5% Fixtures, LF, HID	3-year rolling average (PY5-PY7) of Evaluation Research Findings
1 st Year Installation Rate	75% CFLs 87% LEDs, HID 98% LF	3-year rolling average (PY5-PY7) of Evaluation Research Findings
NTGR	0.64 CFLs 0.78 LEDs, HID 0.75 LF	PY7 Evaluation Research Findings

Source: Evaluation Analysis

E.4. Program Volumetric Detail

The PY7 BILD Program incentivized more than two and a half million lamps, ballasts, fixtures and battery chargers as shown in the table below.

Table E-5. PY7 Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs ³	LEDs ⁴	Linear FLs	HIDs	LF Ballasts	Battery Chargers	Total
PY7 Retail	140,292	453	56,421	N/A	N/A	N/A	N/A	197,166
PY7 Distributor	139,028	260,809	1,052,727	791,443	2,025	67,331	160	2,313,523
PY7 Total	279,320	261,262	1,109,148	791,443	2,025	67,331	160	2,510,689
PY6 Total	343,577	362,332	804,299	840,903	2,607	67,391	N/A	2,421,109
PY5	249,799	347,639	211,955	503,627	2,799	N/A	N/A	1,315,819
PY4	194,180	381,072	N/A	N/A	N/A	N/A	N/A	575,252
PY3	4,173	929	N/A	N/A	N/A	N/A	N/A	5,102

Source: ComEd tracking data and Navigant team analysis.

Table E-6 displays the number of enrolled and participating distributors, retailers, and end-users.

Table E-6. PY7 Enrolled and Participating Distributors, Retailers, and End Users

Program Participants	Enrolled	Participating
Distributors	126	95
Retailers	2	2
End users	NA	~8,000 – 9,000 ⁵

Source: ComEd tracking data and Navigant team analysis.

³ Cold Cathode FL and High Wattage CFLs (>=40 Watts) are included in the Specialty CFL category.

⁴ Includes 19,605 LED Fixtures in the Retail Program, 88,924 LED Fixtures in the Distributor Program, and 16,637 LED exit signs in the Distributor Program.

⁵ 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 PY7.

Table E-7. PY7 Results Summary

Mid-Stream Incentives (BILD)	Units	PY7
Net Savings	MWh	155,239
Net Summer Peak Demand Reduction	MW	34.5
Net Winter Peak Demand Reduction	MW	29.1
Gross Savings	MWh	229,798
Gross Summer Peak Demand Reduction	MW	50.9
Gross Winter Peak Demand Reduction	MW	42.9
Carryover Net Savings	MWh	20,557
Carryover Net Summer Peak Demand Reduction	MW	4.2
Carryover Net Winter Peak Demand Reduction	MW	4.0
Carryover Gross Savings	MWh	30,501
Carryover Gross Summer Peak Demand Reduction	MW	6.2
Carryover Gross Winter Peak Demand Reduction	MW	5.8
Program Realization rate	%	92%
Program NTG Ratio	%	68%
CFLs Sold	#'s	540,582
LEDs Sold	#'s	1,092,511
LED Exit Signs Sold	#'s	16,637
LFs Sold	#'s	791,443
LF Ballasts Sold	#'s	67,331
HIDs Sold	#'s	2,025
Non-Lighting Products Sold	#'s	160
Non-Lighting Products Net Savings	MWh	295
Customers touched	#'s	~8,000 to 9,000

Source: ComEd tracking data and Navigant team analysis.

E.6. Findings and Recommendations

The following provides insight into key program findings and recommendations.⁶

⁶ 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.

Verified Gross Impacts and Realization Rate

Finding 2. The PY7 Gross Verified Energy Savings were estimated to be 229,798 MWh, of which eight percent was attributable to the retail program and 92 percent was attributable to the distributor program. LEDs comprised 69 percent of program savings. The gross realization rate on this savings estimate is 92 percent. Verified savings were lower than ComEd ex ante savings primarily because ex ante estimates do not include a residential / nonresidential split. The IL TRM v3.0 specifies a split of 17 percent residential and 83 percent commercial for CFL and LED lamps and two percent / 98 percent for linear fluorescent lamps. Commercial installations have higher deemed hours of use and interactive effects values than residential installations, so attributing savings to residential installs has a downward impact on savings.

Recommendation 2. ComEd could improve their ex ante savings estimates by applying the deemed residential / nonresidential splits and the other appropriate deemed residential parameters (hours of use, interactive effects, etc.).

Finding 3. For LED MR and PAR shaped lamps, the IL TRM v3.0 baseline wattage method consistently overestimates the baseline (first identified in PY5). The IL TRM v4.0 and draft v5.0 have been updated with new and more accurate models. For ex ante savings, ComEd used the v5.0 methods for these lamps, which resulted in higher savings estimates than the deemed values from v3.0. ComEd, the evaluation team, and the IL Stakeholder Advisory Group (SAG) reviewed this issue and approved the use of the updated methods (e.g., use of TRM v5.0) for PY7 verified savings estimates.

Recommendation 3. Going forward, if ComEd believes a value in the current version of the IL TRM is incorrect or outdated, this issue needs to be addressed with SAG early in the program year and brought to complete resolution prior to the start of the evaluation cycle so that analysis during the evaluation and reporting period is based upon a single TRM.

Verified Net Impacts

Finding 5. The overall unit sales-weighted net-to-gross ratio (NTGR) found in this evaluation was 0.68 based on deemed values.⁷ Combined, the retail and distributor programs accomplished 155,239 MWh of net energy savings, 34.5 net summer peak demand, and 29.1 net winter peak demand reductions. Over 70 percent of these energy savings were from LED lamps and fixtures, while only seven percent were from linear fluorescents. Verified summer and winter peak demand savings were also dominated by LEDs (approximately 73 percent).

Recommendation 4. The evaluation team continues to observe some mild variability in evaluation research NTG results from year to year. The PY7 evaluation research finds that for CFLs and LEDs, the estimated PY7 NTG was approximately the same as the three-year rolling average (CFLs - PY7: 0.64, 3-year: 0.66; LEDs - PY7: 0.78, 3-year: 0.77). For linear fluorescents, the PY7 NTG estimate was 0.75, which is higher than the 3-year average of 0.65. Long term trends and variability in NTG values will continue to be examined, as they may indicate changes in market or program dynamics. However, for PY9, it is recommended that

⁷ Deemed values. Source: ComEd_NTG_History_and_PY7_Recommendation_2014-02-28_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

the SAG approved NTG values used for verified savings continue to be updated with the most recent evaluation research values (PY7).

Process Evaluation.

Finding 7. Based on end-user survey data, the evaluation team estimates that *at least* 15 to 20 percent of BILD LED and LF sales overlapped with the SBES program. LEDs and linear fluorescents made up over 70 percent of BILD Program savings in PY7 so substantial overlaps with SBES requires careful attribution of gross and net savings. The end-user interviews revealed that it was difficult for SBES trade allies who also purchased BILD products to say which incentive was more important to their overall sales – the relative importance was very project and bulb type specific.

Recommendation 5. The substantial overlap between the two programs and difficulties in attributing savings highlights the need for increased collaboration between SBES and BILD teams for program planning / implementation and for program evaluation.

Finding 8. The early program suspension in PY7 was difficult for BILD Program distributors. Approximately 40 percent of the 61 distributors responding to the web survey indicated that the program suspension was unexpected and difficult for their business. A Small Business Energy Savings program trade ally that was also a high-volume end-user in the BILD Program said if the budget is limited, they would prefer to receive a lower incentive that is consistent throughout the year than a higher one that is suspended unexpectedly.

Recommendation 6. Participant uncertainty regarding the future availability of funding is a common challenge for incentive programs. ComEd and the program implementer should continue to work with distributor trade allies to design the BILD Program so that program timelines and funding levels are communicated to distributors well in advance of program activity. As the distributor trade allies are critical to the success of a midstream program, incentives should be designed with them in mind, and delivered in a way that is beneficial to their overall business.

1 Introduction

1.1 Program Description

The Non-Residential Business Instant Lighting Discounts (BILD) Program and Business Products Discounts (BPD) program provide incentives to increase the market share of energy efficient 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. The BPD program offers commercial, industrial and contractor customers discounts, at the time of sale, on high-efficiency battery chargers and transformers.

At this time the BILD Program provides incentives on a mix of standard, specialty, high-wattage and cold-cathode CFLs, LEDs (lamps and fixtures), LED exit signs, linear fluorescent (LF) lamps and ballasts, and high intensity discharge (HID) lamps. The BPD program offers incentives on battery chargers and transformers, though there were no transformers sold through the program in PY7. The PY7 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) \$6 to \$10;
- LED trim kit \$13;
- Linear fluorescent lamps and ballasts \$1;
- HID lamps range from \$10 to \$25;
- Industrial battery chargers \$184 per unit; and
- NEMA Premium electrical transformers \$60 to \$750.⁸

In PY7, BILD Program sales came from a total of 95 unique distributors (this is an increase from 89 unique distributors in PY6) and 105 unique retail locations. BILD products were sold to approximately 8,000 to 9,000 unique end-users.⁹ Ninety-two percent of BILD Program unit sales were delivered via the “distributor program”, while the remaining eight percent were sold through the “retail program,” which sells bulbs directly to contractors through the pro desk of two major Do-it-Yourself retailers.

1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for PY7:

⁸ There were zero transformers and approximately 60 battery chargers distributed through the program in PY7. There were no dedicated evaluation activities for these product types.

⁹ 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.

1.2.1 Impact Questions

1. What is the level of gross annual energy (kWh) and gross peak demand (kW) savings induced by the program?
2. What is the researched value for net-to-gross (NTG) ratio, and what are the overall 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?¹⁰
3. Did the program meet its energy and demand goals? If not, why not?
4. What updates are recommended for the Illinois Technical Reference Manual (TRM)?

1.2.2 Process Questions

1. How can the BILD Program managers, implementers, distributors, and evaluation team work together to improve and streamline the program?

¹⁰ For HID lamps, LF ballasts, LED exit signs, and industrial battery chargers, calculating product type specific impact parameters is not feasible due to the small number of units sold and participating end-users.

2 Evaluation Approach

The analytical methods used for the evaluation of the BILD and BPD programs 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, linear fluorescent ballasts, LED exit signs, and industrial battery chargers comprised less than three percent of program savings, there were no research efforts directed specifically at establishing unique impact parameters for these product categories. As described in Chapter 3, where deemed values were unavailable for certain products, TRM values for the most similar product category was used (e.g. linear fluorescent ballasts use some TRM values for linear fluorescent lamps).

2.1 Overview of Data Collection Activities

The core data collection activities for the evaluation of the PY7 Midstream programs included in-depth telephone interviews with key program staff, CATI telephone and web surveys with BILD end-users, and a web survey of program distributors. 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.¹¹ 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 – November. 2015	<i>Data supporting Gross and Net impact assessment</i>
In Depth Interviews	ComEd BILD Program Manager	1	1	March 2015	<i>Data collection supporting Gross and Net impact assessment and process analysis in the same instrument.</i>
	BILD Program Implementer (DNV GL)	1	1	March 2015	
	BILD End users	5-10	5	Nov. 2014	
CATI Survey	BILD End users	500 ¹²	224	Aug. – Sept. 2015	
Web Survey	BILD End users		159		
	BILD Distributors	Census	61	July – Aug 2015	

¹¹ State of Illinois Energy Efficiency Technical Reference Manual v3.0. Final, As of February 24th, 2014. Effective: June 1st, 2014.

¹² The goal of 500 completes was established based on the estimated number of end-users purchasing each bulb type (CFL, LED, LF). Target completes were set to achieve a 90 percent / 10 percent sampling precision by bulb type based on end-user participation.

Table 2-2. Additional Resources

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

2.2 Verified Savings Parameters

Verified Gross and Net Savings (energy and coincident peak demand) resulting from the PY7 program were calculated using the following algorithms as defined by the Illinois TRM version 3.0:¹³

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 Summer Peak kW Savings = Gross Annual kW Savings * Summer Peak Load CF * IEd

Verified Gross Annual Winter Peak kW Savings = Gross Annual kW Savings × Winter Peak CF¹⁴

Where:

- Delta Watts = Difference between the Baseline Wattage and Energy Efficient Wattage
- HOU = Annual Hours of Use
- ISR = Installation Rate
- Summer 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.
- Winter Peak CF = Peak load coincidence factor, the percentage of Program Bulbs turned on during the PJM Winter Peak hours¹⁵
- 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 specific measures are not explicitly covered (e.g. HID lamps and LF ballasts). In these cases, deemed values from the most similar product category were used. For battery chargers, ComEd submitted a workpaper based on Pacific Gas and Electric Company research that presented verified savings parameters.

¹³ Source: <http://www.ilsag.info/technical-reference-manual.html>

¹⁴ Because ComEd is an electric utility and the majority of ComEd's customer have gas heating, no heating penalties have been included in the winter peak savings estimate.

¹⁵ The Winter Peak Period is defined by PJM as the period from 6-8 am and 5-7 pm, Central Time Zone, between January 1 and February 28.

Table 2-3. Verified Savings Parameter Data Sources

Verified Savings Input Parameters	Data Source	Deemed† or Evaluated?
Program Bulbs	PY7 Program Tracking Data	Evaluated
Delta Watts	TRM v3.0 ¹⁶	Deemed
Res / Non-Res Split	TRM v3.0	Deemed
Hours of Use (HOU)	TRM v3.0	Deemed
Peak Coincidence Factor (CF)	TRM v3.0	Deemed
Energy Interactive Effects	TRM v3.0	Deemed
Demand Interactive Effects	TRM v3.0	Deemed
Installation Rate	TRM v3.0	Deemed
All Battery Charger parameters	ComEd Workpaper	Evaluated
NTGR	Statewide Advisory Group process (EEPS)†	Deemed

† Source: ComEd_NTG_History_and_PY7_Recommendation_2014-02-28_Final_EMV_Recommendations.xlsx, 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 PY7, the evaluation team calculated verified savings for standard CFLs, specialty CFLs, LED bulbs and linear FL bulbs. The sample sizes of LED fixtures, LED exit signs, HID bulbs, linear fluorescent ballasts, and battery chargers were too small to estimate separate parameters for these bulb types. The data used to estimate the verified gross program savings came from the PY7 program tracking data and the IL TRM v3.0.¹⁷ Tracking data was used to weight 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 PY7, the NTGR estimates used to calculate the net verified savings were based on past evaluation research and defined through a negotiation process through SAG; the NTG SAG discussions occur between early January of each year and are completed by March 1st. BILD PY7 NTG values were based upon NTG research in PY4 and PY5 for CFLs and in PY5 for LEDs and linear FL lamps.¹⁸

¹⁶ All deemed parameters were taken from the IL TRM v3.0 with the exception of the baseline wattages for LED MR and PAR lamps. The v3.0 method is outdated for these lamp types and has been updated in v4.0 and draft v5.0. ComEd, the evaluation team, and the IL Stakeholder Advisory Group (SAG) reviewed this issue and approved the use of the updated methods (e.g., use of TRM v5.0) for PY7 verified savings estimates during the Illinois SAG meeting on December 1, 2015.

¹⁷ Ibid.

¹⁸ ComEd_NTG_History_and_PY7_Recommendation_2014-02-28_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

2.3 *Process Evaluation*

The process evaluation of the PY7 BILD Program focused primarily on resolving some of the inherent challenges encountered when evaluating a midstream program. As described above, a midstream program is designed to make program implementation and customer participation streamlined by paying incentives at the distributor level rather than individual end-user rebate applications. The BILD Program is very successful in this regard. However, because end-users are not directly involved in the process, the program evaluation is more complex because program participants cannot be easily identified. Because a large portion of the evaluation activity involves end-user self-report data, the lack of customer data, including customer contact information, hampers the evaluation process. The single largest process evaluation activity in PY7 was comprised of a conference call between the program implementer, the BILD Program manager, several participating distributors, and the evaluation team where customer information data collection strategies were discussed.

3 Gross Impact Evaluation

This section presents the results of the verified gross impact findings.

3.1 Tracking System Review

The tracking system review in the PY7 BILD Program was an iterative process. As in previous program years, the evaluation team was initially provided with a comprehensive database including all program sales since the program's inception. Because it is a comprehensive dataset, the first evaluation activity always involves ensuring that the current program year records are complementary and non-overlapping with bulb sales attributed to previous program years. The evaluation quickly identified that there had been major changes in the database that affected the integrity of the historical tracking data. Duplication of transaction numbers resulted in a large number of historical program records being overwritten. A collaboration between ComEd and the evaluation team resulted in a reconstructed and validated comprehensive dataset.

In addition to reconstructing the dataset, ComEd made several important changes to the tracking database based on recommendations provided by the evaluation team in previous cycles. These changes included making certain fields consistent between the retail and distributor tracking databases¹⁹ and adding additional bulb information to the main tracking dataset instead of in a separate lookup table (lumens, wattage, etc.).

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/candlepower mapping, the bulb information data should include specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.). The evaluation team's review of the tracking data in PY7 identified several instances where the TRM was incorrectly applied in assigning baseline wattages due to using lumen mappings for the incorrect specialty bulb type (described below).

3.2 Program Volumetric Findings

As shown in Table 3-1. PY7 Volumetric Findings Detail, the total number of units sold during the PY7 BILD Program was 2,510,689, which is a four percent increase from the total units sold in PY6. Eleven percent of these were standard CFLs, 10 percent were specialty CFLs,²⁰ 44 percent were LEDs,²¹ 32 percent were linear fluorescents, 3 percent were linear fluorescent ballasts, and the remaining 0.1 percent was HID lamps and battery chargers (product sales are represented graphically in Figure 3-1). Compared to PY6, the number of standard CFLs, specialty CFLs, HIDs, and linear fluorescent lamps all decreased,

¹⁹ In prior databases, 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 was equal to the sum of the "Quantity" field and for the retail program, the total number of bulbs was equal to the sum of the "Quantity" field times the "Pack_Size" field.

²⁰ Including Cold Cathode FL lamps and High Wattage CFLs (≥ 40 Watts).

²¹ Including LED Fixtures and exit signs.

while LF ballast sales remained approximately the same. The only notable increase in sales was for LEDs, which increased by 38 percent. The sales generated through the retail program were small for most product categories. For standard CFLs, however, the retail program accounted for 50 percent of total sales.

Key findings include:

1. Overall unit sales increased four percent over PY6.
2. LED unit sales increased by 38 percent over PY6.
3. The retail program accounted for 50 percent of standard CFL unit sales.

Table 3-1. PY7 Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs ²²	LEDs ²³	Linear FLs	HIDs	LF Ballasts	Battery Chargers	Total
PY7 Retail	140,292	453	56,421	N/A	N/A	N/A	N/A	197,166
PY7 Distributor	139,028	260,809	1,052,727	791,443	2,025	67,331	160	2,313,523
PY7 Total	279,320	261,262	1,109,148	791,443	2,025	67,331	160	2,510,689
PY6 Total	343,577	362,332	804,299	840,903	2,607	67,391	N/A	2,421,109
PY5	249,799	347,639	211,955	503,627	2,799	N/A	N/A	1,315,819
PY4	194,180	381,072	N/A	N/A	N/A	N/A	N/A	575,252
PY3	4,173	929	N/A	N/A	N/A	N/A	N/A	5,102

Source: ComEd tracking data and Navigant team analysis.

Table 3-2 provides the volume of bulbs incentivized through the BILD Program estimated to have been installed during the PY7 program year. This includes bulbs sold in prior program years and installed in PY7.

Table 3-2. PY7 Installed Volumetric Findings Detail

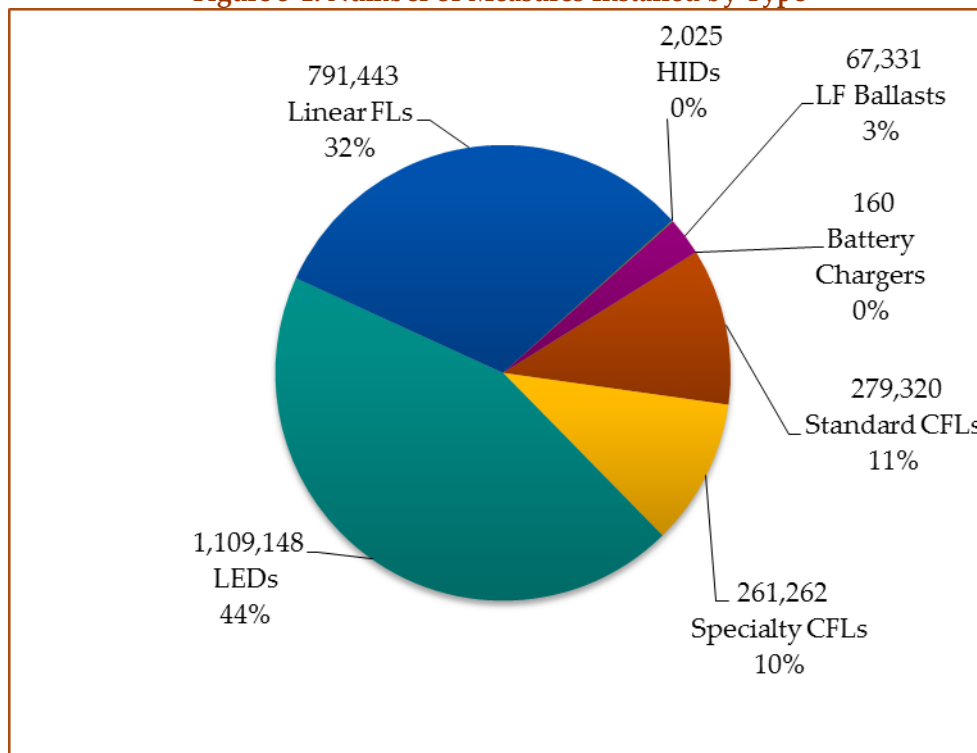
Program Year	Standard CFLs	Specialty CFLs	LEDs	Linear FLs	HIDs	LF Ballasts	Battery Chargers	Total
PY7 Incentivized Units	279,320	261,262	1,109,148	791,443	2,025	67,331	160	2,510,689
PY7 1st Year Installed Units	209,147	200,450	1,014,155	759,785	1,843	64,638	160	2,250,178
PY5 Carryover Units – installed in PY7	37,951	35,499	0	76,514	0	0	0	149,965
PY6 Carryover Units – installed in PY7	62,298	65,699	11,601	3,634	38	33,692	0	176,961
Total Installed Units in PY7	309,396	301,648	1,025,756	839,934	1,880	98,330	160	2,577,104

Source: ComEd tracking data and Navigant team analysis.

²² Cold Cathode FL and High Wattage CFLs (≥ 40 Watts) are included in the Specialty CFL category.

²³ Includes 19,605 LED Fixtures in the Retail Program, 88,924 LED Fixtures in the Distributor Program, and 16,637 LED exit signs in the Distributor Program.

Figure 3-1. Number of Measures Installed by Type



Source: ComEd tracking data and Navigant team analysis.

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

Table 3-3. PY7 Enrolled and Participating Distributors, Retailers, and End Users

Program Participants	Enrolled	Participating
Distributors	126	95
Retailers	2	2
End users	NA	~8,000 - 9,000

Source: ComEd tracking data and Navigant team analysis.

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. Evaluation research verified specialty bulb type classifications (globe, candelabra, PAR30, etc.) and ensured that TRM parameters that vary by bulb type were applied correctly. The evaluation team also applied the residential and non-residential splits for each product type. The resulting verified savings parameters used in PY7 that are independent of installation location (residential versus non-residential) 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.

Table 3-4. Verified Gross Savings Parameters

Gross Impact Parameters	Population	PY7 ComEd Reported (Ex Ante)	PY7 Verified Savings
Program Unit Sales	Standard CFLs	279,320	279,089
	Specialty CFLs	261,262	261,493
	LED Bulbs	983,982	
	LED Fixtures	108,529	
	LED Exit Signs	16,637	
	Linear FL	791,443	
	HID	2,025	
	Ballasts	67,331	
	Battery Chargers	160	
	Total	2,510,689	
Delta Watts	Standard CFLs	33.4	33.3
	Specialty CFLs	28.9	31.0
	LED Bulbs	45.1	44.0
	LED Fixtures	42.2	45.4
	LED Exit Signs	7.9	20.2
	Linear FL	4.5	
	HID	71.8	
	Ballasts	4.4	4.5
	Battery Chargers	330.7	
Res/NonRes	CFL, LED Bulbs, and LED Fixtures	0% / 100%	17% / 83%
	LF, LED Exit Signs, HID, and Ballasts	0% / 100%	2% / 98%
	Battery Chargers	0% / 100%	
Carryover Bulbs	PY5 and PY6 Sales	326,926	

Source: ComEd tracking data, Navigant team analysis, and State of Illinois Technical Reference Manual version 3.0 from <http://www.ilsag.info/technical-reference-manual.html>.

Table 3-5. Verified Gross Savings Parameters – Residential vs. Non-Residential

Gross Impact Parameters	Bulb Type	PY7 ComEd Reported (Ex Ante)	PY7 Verified Savings	
			Res	NonRes
Installation Rate	Standard CFLs	75.5% / 72%	72.20%	75.50%
	Specialty CFLs	75.5%	82.30%	75.50%
	LED Bulbs	91.0%	92%	91%
	LED Fixtures	91.0%	100%	91%
	LED Exit Signs	100.0%	100%	100%
	Linear FL	96.0%	96.00%	96.00%
	HID	75.5%	100%	91%
	Ballasts	96.0%	96.00%	96.00%
	Battery Chargers	100.0%	NA	100.00%
Hours of Use	Standard CFLs	3048 / 3198	938	3,198
	Specialty CFLs			
	LED Bulbs			
	LED Fixtures	4539 / 3198	1,010	4,576
	LED Exit Signs	8,766	8,766	8,766
	Linear FL	4,576	1,010	4,576
	HID			
	Ballasts			
	Battery Chargers†	8372 / 8216 / 8736	NA	8372 / 8216 / 8736
Summer Peak CF	Standard CFLs	0.66	0.095	0.66
	Specialty CFLs			
	LED Bulbs			
	LED Fixtures	1.00	1.00	1.00
	LED Exit Signs			
	Linear FL			
	HID	0.66	0.095	0.66
	Ballasts	0.30	NA	0.30
	Battery Chargers†			
Winter Peak CF	Standard CFLs	NR	0.116	0.55
	Specialty CFLs			
	LED Bulbs			
	LED Fixtures	NR	1.00	1.00
	LED Exit Signs			
	Linear FL			
	HID	NR	0.116	0.55
	Ballasts	NR	NA	0.30
	Battery Chargers†			
Interactive Effects – Energy/Demand	Standard CFLs	1.24 / 1.46	1.06 / 1.11	1.24 / 1.46
	Specialty CFLs			
	LED Bulbs			
	LED Fixtures		1.04 / 1.07	
	LED Exit Signs			
	Linear FL			
	HID		1.06 / 1.11	
	Ballasts			
	Battery Chargers†			
		1.0 / 1.0	NA	varies

Source: ComEd tracking data, Navigant team analysis, and State of Illinois Technical Reference Manual version 3.0 from <http://www.ilsag.info/technical-reference-manual.html>.

[†] Based on Pacific Gas and Electric Company research and ComEd workpaper. See Appendix.

3.3.1 Unit Sales

The only difference in unit sales between PY7 ComEd reported and verified savings is a small number of specialty CFLs were classified as standard CFLs by ComEd (some A-lamps, dimmable twists, globes, reflectors, and post lamps). These misclassifications have a very minor overall impact on savings claims.

3.3.2 Delta Watts

The average delta watts values for ComEd reported and verified savings show differences for several lamp types. The average TRM-based delta watts estimate for specialty CFLs was found to be seven percent higher than claimed by ComEd. This difference is primarily due to the misapplication of the TRM for some candelabra, globe, and reflector lamps (the majority of the difference is attributed to reflectors). The verified savings average delta watts for LED Fixtures is 8 percent higher than claimed by ComEd. ComEd defined baseline wattages for LED Fixtures (trim kits) do not appear to follow a consistent approach in defining baseline wattages. The IL TRM v3.0 does not provide specific guidance for commercial LED Fixtures. The verified savings baseline wattages for these fixtures is based on the methods outlined for BR30 lamps. Additionally, the average TRM-based delta watts estimate for LED exit signs is 155 percent higher than claimed by ComEd. In ComEd's tracking data, the "baseline wattage" and "measure wattage" variables are properly defined. However, the "delta watts" variable, which is used by ComEd to calculate savings, is not calculated using the proper baseline wattage (ComEd uses the "fluorescent" baseline defined in the TRM – 11W instead of the "Unknown" baseline – 23W).

For LED lamps, the average TRM-based delta watts estimate is two percent lower than claimed by ComEd. This small difference is due to the misapplication of the TRM v3.0 for a small number of lamps, primarily R30 reflector lamps. However, a much larger difference would have been observed had the TRM v3.0 method for establishing baseline wattage been used for all LED lamps. For LED MR and PAR shaped lamps, the IL TRM v3.0 baseline wattage method has been found to consistently overestimate the baseline (first identified in PY5). The IL TRM v4.0 and draft v5.0 have been updated with new and more accurate models. For ex ante savings, ComEd used the v5.0 methods for these lamps in their tracking system, which resulted in higher savings estimates than the deemed values from v3.0. ComEd, the evaluation team, and the IL Stakeholder Advisory Group (SAG) reviewed this issue and approved the use of the updated methods (e.g., use of TRM v5.0) for PY7 verified savings estimates during the Illinois SAG meeting on December 1, 2015. Had the v3.0 method been used for all LED lamps, the average delta watts would have been 38.6 (12 percent lower).

3.3.3 Installation Rates

ComEd does not define a residential / non-residential split in their ex-ante estimates and therefore use the non-residential installation rates as defined by the IL TRM. These installation rates were defined properly for all product types except standard CFLs and HID lamps. For standard CFLs (in the retail program) ComEd used two different installation rates (75.5 percent and 72 percent). While these are the same installation rates used for the verified savings estimate, the 72 percent installation rate is for residential applications. It appears this was an error rather than an effort to apportion savings between residential and non-residential installations. 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 more similar to that of LEDs than CFLs, so it was set at 91 percent.

3.3.4 Residential/Non-residential Installation Location Split

There were no residential installations for BILD products assumed by ComEd in their tracking system. The values used for the Verified Savings Res/Non-Res split were derived from the IL TRM v3.0.

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

There were no residential installations for BILD products assumed by ComEd in their tracking system. For peak coincidence factors and energy and demand interactive effects, the only difference between ComEd defined and verified savings parameters is the use of the residential values (as defined by the TRM) for those products installed in residential locations. For hours of use, the ComEd defined values vary from those established in the TRM. For standard CFLs, specialty CFLs, LED lamps, and LED fixtures, different values were used for the same product types in the retail program as compared to the distributor program. Even within the retail program, two different hours of use estimates were used for standard CFLs (3048 and 3198). For battery chargers, three different hours of use values were used based on a Pacific Gas and Electric Company (PG&E) study on this technology and information provided by the end-user. The evaluation team has reviewed and accepted these methods and ComEd's workpaper based on the PG&E study.²⁴

3.4 Verified Gross Program Impact Results

The resulting total program verified gross savings is 229,798 MWh, 50.9 peak summer MW, and 42.9 peak winter MW as shown in the following table (Table 3-6, all savings contribute to the EEPs portfolio). The table presents savings for each product type and distinguishes between the retail and distributor channels. These saving estimates are based on deemed parameter estimates from the TRM v3.0.²⁵ The evaluation team verified the quantity of bulbs sold based on the tracking data and found they matched with the ex ante estimates, except a small number of specialty CFLs classified as Standard CFLs as described above. The verified gross realization rates shown in the table below are calculated as the proportion of ex ante savings found within the verified savings analysis. ComEd did not provide ex ante savings estimates for gross summer and winter peak MW savings, so no ex ante values or realization rates are presented for those metrics.

There are two line items for LED lamps (TRM v3.0 and TRM v5.0) in the following table. As specified above, this is due to an outdated method in IL TRM v3.0 for estimating the baseline wattage of LED MR and PAR shaped lamps. ComEd, the evaluation team, and the IL Stakeholder Advisory Group (SAG) reviewed this issue and approved the use of the updated methods (e.g., use of TRM v5.0) for PY7 verified savings estimates. All verified savings estimates presented in this draft use the TRM v5.0 method for calculating baseline wattages for LED MR and PAR lamps. The TRM v3.0 entries are presented for comparison purposes only and are not included in the totals.

²⁴ See Appendix

²⁵ With the exception of the delta watts parameter for LED PAR and MR lamps, which use the baseline wattage methods outlined in IL TRM v5.0.

Table 3-6. PY7 Verified Gross Impact Savings Estimates by Measure Type

	Ex-Ante Gross MWh Savings	Verified Gross Realization Rate	Verified Gross MWh Savings	Verified Gross Summer Peak MW Savings	Verified Gross Winter Peak MW Savings
Retail Channel					
Standard CFLs	11,716	91%	10,704	2.5	2.1
Specialty CFLs	65	92%	59	0.0	0.0
LED Lamps – TRM v3.0*	5,351	91%	4,853	1.1	1.0
LED Lamps – TRM v5.0	5,351	93%	4,982	1.2	1.0
LED Fixture	3,944	86%	3,375	0.6	0.5
Total*	21,076	91%	19,120	4.3	3.6
Distributor Channel					
Standard CFLs	15,592	87%	13,512	3.2	2.7
Specialty CFLs	22,563	94%	21,197	5.0	4.2
LED Lamps – TRM v3.0*	154,414	74%	114,928	27.2	22.9
LED Lamps – TRM v5.0	154,414	85%	131,557	31.1	26.2
LED Fixture	13,756	136%	18,661	3.1	2.6
LED Exit Sign	1,434	255%	3,659	0.5	0.5
Linear Fluorescent	19,583	98%	19,265	3.3	2.7
CMH	623	121%	750	0.1	0.1
Ballasts	1,628	100%	1,635	0.3	0.2
Battery Chargers	441	100%	441	0.1	0.1
Total*	230,033	92%	210,678	46.6	39.3
Retail and Distributor Channels					
Total*	251,109	92%	229,798	50.9	42.9

Source: ComEd tracking data and Navigant team analysis.

* Totals include "LED Lamps – TRM v5.0." Results for LED Lamps using TRM v3.0 are presented for comparison purposes only.

The BILD Program is able to claim energy and demand savings from program bulbs purchased during PY5 and PY6 but not installed (i.e., used by the consumer) until the current program year. Table 3-7 provides estimates of the verified gross savings resulting from these carryover bulbs.

Table 3-7. PY7 Verified Gross Impact Savings from PY5 and PY6 Carryover Bulbs

	PY5 Program Bulbs	PY6 Program Bulbs	Total
Verified Gross MWh Savings	12,189	18,313	30,501
Verified Gross Summer Peak MW Savings	2.3	3.9	6.2
Verified Gross Winter Peak MW Savings	2.1	3.7	5.8

Source: ComEd tracking data and Navigant team analysis.

Table 3-8 below shows the total PY7 Verified Gross Impact Savings from PY7 sales and carryover bulbs.

Table 3-8. PY7 Total Verified Gross Impact Savings from PY7 Sales and Carryover Bulbs

Savings Category	Energy Savings (MWh)	Summer Peak Demand Savings (MW)	Winter Peak Demand Savings (MW)
Ex Ante Gross Savings	251,109	NR	NR
Verified Gross Savings	229,798	50.9	42.9
Verified Gross Carryover Savings	30,501	6.2	5.8
Verified Total PY7 Gross Savings	260,299	57.1	48.7

Source: ComEd tracking data and Navigant team analysis.

4 Net Impact Evaluation

SAG determined²⁶ that the NTG values for this program should be deemed prospectively and used to calculate verified net savings. Verified net energy and demand (summer and winter coincident peak) 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 0.64 for CFLs, 0.70 for LEDs, 0.56 for linear fluorescents, and 0.67 for all other BILD products, as specified by SAG. The tables below show the deemed NTG values and the PY7 verified net savings (all savings attributed to the EEPs portfolio).

Table 4-1. PY7 Verified Net MWh Impact Savings Estimates by Measure Type

	Ex-Ante Gross MWh Savings	Verified Gross Realization Rate	Verified Gross MWh Savings	NTG Ratio	Verified Net MWh Savings
Retail Channel					
Standard CFLs	11,716	0.91	10,704	0.64	6,851
Specialty CFLs	65	0.92	59	0.64	38
LED Lamps – TRM v3.0*	5,351	0.91	4,853	0.70	3,397
LED Lamps – TRM v5.0	5,351	0.93	4,982	0.70	3,487
LED Fixture	3,944	0.86	3,375	0.70	2,362
Total*	21,076	0.91	19,120	0.67	12,738
Distributor Channel					
Standard CFLs	15,592	0.87	13,512	0.64	8,648
Specialty CFLs	22,563	0.94	21,197	0.64	13,566
LED Lamps – TRM v3.0*	154,414	0.74	114,928	0.70	80,449
LED Lamps – TRM v5.0	154,414	0.85	131,557	0.70	92,090
LED Fixture	13,756	1.4	18,661	0.70	13,063
LED Exit Sign	1,434	2.6	3,659	0.67	2,452
Linear Fluorescent	19,583	1.0	19,265	0.56	10,789
CMH	623	1.2	750	0.67	503
Ballasts	1,628	1.0	1,635	0.67	1,095
Battery Chargers	441	1.0	441	0.67	295
Total*	230,033	0.92	210,678	0.68	142,500
Retail and Distributor Channels					
Total*	251,109	0.92	229,798	0.68	155,239

Source: ComEd tracking data and Navigant team analysis.

* Totals include "LED Lamps – TRM v5.0." Results for LED Lamps using TRM v3.0 are presented for comparison purposes only.

²⁶ Source: ComEd_NTG_History_and_PY7_Recommendation_2014-02-28_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

Table 4-2. PY7 Verified Net Peak MW Impact Savings Estimates by Measure Type

	Verified Gross Summer Peak MW Savings	Verified Gross Winter Peak MW Savings	NTG Ratio	Verified Net Summer Peak MW Savings	Verified Net Winter Peak MW Savings
Retail Channel					
Standard CFLs	2.5	2.1	0.64	1.6	1.4
Specialty CFLs	0.0	0.0	0.64	0.0	0.0
LED Lamps – TRM v3.0*	1.1	1.0	0.70	0.8	0.7
LED Lamps – TRM v5.0	1.2	1.0	0.70	0.8	0.7
LED Fixture	0.6	0.5	0.70	0.4	0.3
Total*	4.3	3.6	0.66	2.8	2.4
Distributor Channel					
Standard CFLs	3.2	2.7	0.64	2.0	1.7
Specialty CFLs	5.0	4.2	0.64	3.2	2.7
LED Lamps – TRM v3.0*	27.2	22.9	0.70	19.0	16.0
LED Lamps – TRM v5.0	31.1	26.2	0.70	21.8	18.3
LED Fixture	3.1	2.6	0.70	2.2	1.8
LED Exit Sign	0.5	0.5	0.67	0.3	0.3
Linear Fluorescent	3.3	2.7	0.56	1.8	1.5
CMH	0.1	0.1	0.67	0.1	0.1
Ballasts	0.3	0.2	0.67	0.2	0.2
Battery Chargers	0.1	0.1	0.67	0.0	0.0
Total*	46.6	39.3	0.68	31.7	26.7
Retail and Distributor Channels					
Total*	50.9	42.9	0.68	34.5	29.1

Source: ComEd tracking data and Navigant team analysis.

* Totals include "LED Lamps – TRM v5.0." Results for LED Lamps using TRM v3.0 are presented for comparison purposes only.

The BILD Program is able to claim energy and demand savings from program bulbs purchased during PY5 and PY6 but not installed (i.e., used by the consumer) until the current program year. Table 4-3 provides estimates of the Verified Net savings resulting from these carryover bulbs.

Table 4-3. PY7 Verified Net Impact Savings from PY5 and PY6 Carryover Bulbs

	PY5 Program Bulbs	PY6 Program Bulbs	Total
Verified Net MWh Savings	9,020	11,537	20,557
Verified Net Summer Peak MW Savings	1.7	2.5	4.2
Verified Net Winter Peak MW Savings	1.6	2.3	4.0

Source: ComEd tracking data and Navigant team analysis.

Table 4-4 shows the total PY7 verified net impact savings from PY7 sales and carryover bulbs.

Table 4-4. PY7 Total Verified Net Impact Savings from PY7 Sales and Carryover Bulbs

Savings Category	Energy Savings (MWh)	Summer Peak Demand Savings (MW)	Winter Peak Demand Savings (MW)
Verified Net Savings	155,239	34.5	29.1
Verified Net Carryover Savings	20,557	4.2	4.0
Verified Total PY7 Net Savings	175,795	38.7	33.0

Source: ComEd tracking data and Navigant team analysis.

4.1 PY8 Carryover Savings Estimate

Calculation of the PY8 carryover estimate relies upon the IL TRM (v 3.0 and 4.0) and the PY6 and PY7 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 PY8. The energy and demand savings from these PY6 and PY7 late installed bulbs are calculated based on the following parameters:

- Delta Watts – Verified savings estimate from the year of installation (source: IL TRM v4.0)
- Res/Non-Res Split - Evaluation research from the year of purchase (PY6 and PY7 Reports)
- HOU and Peak CF – Verified savings estimate from the year of installation (source: IL TRM v4.0)
- Energy and Demand IE – Verified savings estimate from the year of installation (source: IL TRM v4.0)
- Installation Rate - Verified savings estimate from the year of purchase (source: IL TRM v2.0 and IL TRM v3.0)
- NTGR – Evaluation research from the year of purchase (source: PY6 and PY7 Reports)

Table 4-5 shows that in PY8 321,813 bulbs, purchased during either PY6 or PY7, 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 19,687 MWh, 4.0 summer peak MW, and 3.4 winter peak MW, which will be counted in PY8 as BILD lighting program carryover savings.

Table 4-5. PY8 Verified Savings Carryover Estimate

PY8 Verified Savings Carryover Estimate	PY6 Bulbs	PY7 Bulbs	PY8 Carryover
Carryover Bulbs Installed in PY8	210,541	111,272	321,813
Average Delta Watts	16.7	33.7	n/a
Average Daily Hours of Use	10.9	9.0	n/a
Summer Peak Load Coincidence Factor	0.61	0.58	n/a
Winter Peak Load Coincidence Factor	0.51	0.49	n/a
Gross kWh Impact per unit	56.3	107.7	n/a
Gross kW Impact per unit	0.02	0.03	n/a
Installation Rate	100%	100%	n/a
Energy Interactive Effects	1.30	1.30	n/a
Demand Interactive Effects	1.43	1.51	n/a
Carryover Gross MWh Savings	15,416	15,586	31,002
Carryover Gross MW Savings	3.5	3.7	7.3
Carryover Gross Summer Peak MW Savings	3.1	3.3	6.3
Carryover Gross Winter Peak MW Savings	2.6	2.7	5.3
Net-to-Gross Ratio	0.63	0.65	0.64*
Carryover Net MWh Savings	9,712	9,975	19,687
Carryover Net MW Savings	2.2	2.4	4.6
Carryover Net Summer Peak MW Savings	1.9	2.1	4.0
Carryover Net Winter Peak MW Savings	1.6	1.8	3.4

Source: Evaluation Team analysis.

* This value is a bulb weighted average of the NTG ratios from PY6 and PY7.

5 Process Evaluation

As described in the BILD PY7 evaluation plan, the primary process evaluation activity of the PY7 BILD Program was meant to resolve some of the inherent data collection challenges encountered when evaluating a midstream program. While these activities were conducted (and successful, as described below), two additional process related findings were identified during PY7 data collection and analysis. The first is a large overlap between products sold through the BILD Program and installed through the ComEd Small Business Energy Savings (SBES) program. As described in the following section, this overlap has implications for both gross and net attribution between the two programs. Additionally, as mentioned previously, the PY7 BILD Program was suspended approximately five months early due to program goals being met earlier than anticipated. While this indicates that the program is in high demand, the suspension was difficult for distributors for a variety of reasons. Additional process evaluation topics and details are covered in the Appendix (Section 7).

5.1 BILD Overlap with the Small Business Energy Savings (SBES) Program

Subsequent to the beginning of the PY7 evaluation year, an overlap was identified between the ComEd BILD Program and the ComEd Small Business Energy Savings program. The SBES program offers free energy audits, contractor quotes and incentives for upgrades, as well as direct installation services for little to no customer cost. Part of the SBES program includes lighting retrofits with BILD qualified products. SBES trade allies receive a combined materials and labor incentive for installing energy efficient lighting for small businesses, which also includes the BILD discount through a BILD distributor trade ally. In PY7, it was not possible to determine record level overlap between the two programs. Due to this, savings from any BILD qualified product installed through the SBES program was subtracted from SBES program savings, regardless of whether that product actually received a BILD discount. The BILD and SBES evaluation teams are currently conducting evaluation planning meetings to attribute gross savings between the two programs going forward.

Based on end-user survey data, the evaluation team estimates that *at least* 15 to 20 percent of BILD LED and LF sales overlapped with the SBES program. Because those figures are based solely on those who identified as SBES trade allies in the BILD end-user surveys, they represent a lower bound of what the total overlap is between the two programs. LEDs and linear fluorescents made up over 70 percent of BILD Program savings in PY7 so substantial overlaps with SBES requires careful attribution of gross savings.

Attribution of net savings is important as well. Twenty-one of the end-user surveys and three in depth interviews were with SBES trade allies receiving BILD Program discounts. They were asked to rate the importance of the BILD incentive as compared to the SBES incentive for those projects receiving both. Data from the end-user surveys (web and CATI) showed low response rates to the question which showed no clear trends. The in depth interviews revealed that it was difficult for trade allies to say which incentive was more important to their overall sales – the relative importance was very project and bulb type specific. This highlights the need for increased collaboration between SBES and BILD teams for program planning / implementation and for program evaluation.

5.2 Program Suspension

In PY7 the BILD Program incentives were suspended five months early, ending January 6th, 2015 instead of the typical program year end on May 31st. Distributors were asked about any challenges they experienced resulting from participation in the program. While most distributors were complimentary of the program in general, nearly 40 percent of the 61 distributors surveyed indicated that the early program suspension was very difficult for their business. Highlights from those responses include:

- Increased administrative costs incurred due to setting up incentives within their sales and billing systems and then removing those incentives midway through the year;
- *“Chaos from constant changes.”;*
- Lack of BILD funding leading to layoffs – *“I know a lot of people who were unemployed for at least 3-4 months and still are because of what happened at the end of PY7.”;*
- *“It is difficult to quote a project when you don’t know if the incentive will still be there when the quote is approved. We have eaten quite a few of those instances.”;*
- *“There should have been some advanced warning before the program so abruptly ended. The lack of warning created some havoc with our salespeople and our customers.”; and*
- *“We can no longer guarantee our quotes to our customers.”*

Similar comments were included in many of the distributor responses. Additionally, several of the in depth end-user interviews were with lighting contractors that regularly make large purchases of BILD products throughout the program year. Those respondents said that their companies focus exclusively on efficient lighting products, and they have come to rely on the BILD incentives for a large portion of their sales to clients. When the BILD Program was suspended, their businesses suffered. Those respondents all indicated that they would prefer to have lower incentives that are consistent throughout the program year than to have an unexpected suspension of the incentives altogether.

5.3 Midstream Incentive Program Data Collection Efforts

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 low end-user survey completion rate experienced by the evaluation team (less than 10 percent), it would have been necessary to obtain contact information for every program participant. While it is a requirement for all distributors to provide detailed customer information for all program sales on request, this process is cumbersome, labor intensive, expensive, and inexact. This process also greatly extends the evaluation timeline, which results in a slow feedback cycle.

Following through on a recommendation from PY6, the evaluation team conducted a conference call between the program implementer, the BILD Program manager, and several participating distributors to arrive at a reasonable solution to this problem. The primary result of this phone call was that the distributors and implementers agreed that it would be a program requirement to submit a unique customer identification number along with the business name and address currently including in the program tracking data. While this would not forego the need for the evaluation team to request customer contact information (names, phone, email), it would streamline the process considerably.

In the time since the process conference call, the ComEd program manager has informed the evaluation team that they were able to take this one step further and actually append customer contact information directly to the tracking data. This improvement will greatly assist the evaluation efforts and, combined with increased use of end-user web surveys introduced in the PY7 evaluation, will help the evaluation team provide more timely feedback to ComEd going forward. However, as part of the PY7 distributor survey, some distributors commented that the increased reporting requirements implemented in PY8 were challenging for them. ComEd program managers and implementers should be cognizant of any effects this may have on distributor participation.

6 Findings and Recommendations

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

Program Tracking Data Review

Finding 1. In the PY7 tracking data, duplication of transaction numbers resulted in a large number of historical program records being overwritten. A collaboration between ComEd and the evaluation team resulted in a reconstructed and validated comprehensive dataset. In addition to reconstructing the dataset, ComEd made several important changes to the tracking database based on recommendations provided by the evaluation team in previous cycles. The new database is much improved and easy to use.

Recommendation 1. The evaluation team only has one additional recommendation for the current tracking data. To accurately determine delta watts using the evaluation recommended lumen/candlepower mapping, the bulb information data should include specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.). The evaluation team's review of the tracking data in PY7 identified several instances where the TRM was incorrectly applied in assigning baseline wattages due to using lumen mappings for the incorrect specialty bulb type.

Verified Gross Impacts and Realization Rate

Finding 2. The PY7 Gross Verified Energy Savings were estimated to be 229,798 MWh of which eight percent was attributable to the retail program and 92 percent was attributable to the distributor program. LEDs comprised 72 percent of program energy savings. The gross realization rate on this savings estimate is 92 percent. Verified savings were lower than ComEd ex ante savings primarily because ex ante estimates do not include a residential / nonresidential split. The IL TRM v3.0 specifies a split of 17 percent residential and 83 percent commercial for CFL and LED lamps and two percent / 98 percent for linear fluorescent lamps. Commercial installations have higher deemed hours of use and interactive effects values than residential installations, so attributing savings to residential installs has a downward impact on savings.

Recommendation 2. ComEd could improve their ex ante savings estimates by applying the deemed residential / nonresidential splits and the other appropriate deemed residential parameters (hours of use, interactive effects, etc.).

Finding 3. For LED MR and PAR shaped lamps, the IL TRM v3.0 baseline wattage method consistently overestimates the baseline (first identified in PY5). The IL TRM v4.0 and draft v5.0 have been updated with new and more accurate models. For ex ante savings, ComEd used the v5.0 methods for these lamps, which resulted in higher savings estimates than the deemed values from v3.0. ComEd, the evaluation team, and the IL Stakeholder Advisory Group (SAG) reviewed this issue and approved the use of the updated methods (e.g., use of TRM v5.0) for PY7 verified savings estimates at the December 1, 2015 SAG TAC meeting.

Recommendation 3. Going forward, if ComEd believes a value in the current version of the IL TRM is incorrect or outdated, this issue needs to be addressed with SAG early in the program year and brought to complete resolution prior to the evaluation cycle so that analysis during the evaluation and reporting period are based upon a single TRM.

Peak Demand Reduction.

Finding 4. The PY7 gross verified savings summer peak demand reduction was 50.9 MW and winter peak demand savings were 42.9 MW. The net verified savings summer and winter peak demand reductions were 34.5 MW and 29.1, respectively. As in PY6, the largest portion of these savings are due to the continued growth of LED sales, which comprised 73 percent of verified net peak demand savings.

Verified Net Impacts

Finding 5. The overall unit sales-weighted net-to-gross ratio (NTGR) found in this evaluation was 0.68 based on deemed values.²⁷ Combined, the retail and distributor programs accomplished 155,239 MWh of net energy savings, 34.5 summer peak demand, and 29.1 winter peak demand reductions. Over 70 percent of these energy savings were from LED lamps and fixtures while only seven percent were from linear fluorescents. Verified summer and winter peak demand savings were also dominated by LEDs (approximately 73 percent).

Recommendation 4. The evaluation team continues to observe some mild variability in evaluation research NTG results from year to year. The PY7 evaluation research finds that for CFLs and LEDs, the estimated PY7 NTG was approximately the same as the three-year rolling average (CFLs - PY7: 0.64, 3-year: 0.66; LEDs - PY7: 0.78, 3-year: 0.77). For linear fluorescents, the PY7 NTG estimate was 0.75, which is higher than the 3-year average of 0.65. Long term trends and variability in NTG values will continue to be examined, as they may indicate changes in market or program dynamics. However, for PY9, it is recommended that the SAG approved NTG values used for verified savings continue to be updated with the most recent evaluation research values (PY7).

Program Volumetric Findings.

Finding 6. The total number of units sold during the PY7 BILD Program was 2,510,689, which is a four percent increase from the total units sold in PY6. Eleven percent of these were standard CFLs, 10 percent were specialty CFLs,²⁸ 44 percent were LEDs,²⁹ 32 percent were linear fluorescents, 3 percent were linear fluorescent ballasts, and the remaining 0.1 percent was HID lamps and battery chargers. Compared to PY6, the number of standard CFLs, specialty CFLs, HIDs, and linear fluorescent lamps all decreased, while LF ballast sales remained approximately the same. The only notable increase in sales was for LEDs, which increased by 38 percent. The sales generated through the retail program were small for most product categories. For standard CFLs, however, the retail program accounted for 50 percent of total sales.

Process Evaluation.

Finding 7. Based on end-user survey data, the evaluation team estimates that *at least* 15 to 20 percent of BILD LED and LF sales overlapped with the SBES program. LEDs and linear fluorescents made up over 70 percent of BILD Program savings in PY7 so substantial overlaps with SBES

²⁷ Deemed values. Source: ComEd_NTG_History_and_PY7_Recommendation_2014-02-

28_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

²⁸ Including Cold Cathode FL lamps and High Wattage CFLs (>=40 Watts).

²⁹ Including LED Fixtures and exit signs.

requires careful attribution of gross and net savings. The end-user interviews revealed that it was difficult for SBES trade allies who also purchased BILD products to say which incentive was more important to their overall sales – the relative importance was very project and bulb type specific.

Recommendation 5. The substantial overlap between the two programs and difficulties in attributing savings highlights the need for increased collaboration between SBES and BILD teams for program planning / implementation and for program evaluation.

Finding 8. The early program suspension in PY7 was difficult for BILD Program distributors.

Approximately 40 percent of the 61 distributors responding to the web survey indicated that the program suspension was unexpected and difficult for their business. A Small Business Energy Savings program trade ally that was a high-volume end-user in the BILD Program said if the budget is limited, they would prefer to receive a lower incentive that is consistent throughout the year than a higher one that is suspended unexpectedly.

Recommendation 6. Participant uncertainty regarding the future availability of funding is a common challenge for incentive programs. ComEd and the program implementer should continue to work with distributor trade allies to design the BILD Program so that program timelines and funding levels are communicated to distributors well in advance of program activity. As the distributor trade allies are critical to the success of a midstream program, incentives should be designed with them in mind, and delivered in a way that is beneficial to their overall business.

Finding 9. The PY7 evaluation was able to complete more end-user surveys than in any other evaluation year but still fell short of the target. A lack of end-user information is an inherent challenge in a midstream program evaluation. A conference call between BILD Program implementers, ComEd staff, distributor trade allies, and the evaluation team discussed the feasibility of making end-user information available to the evaluation team for all transactions as part of the tracking data. ComEd has now made this a requirement for PY8.

Recommendation 7. As part of the PY7 distributor survey, some distributors commented that the increased reporting requirements implemented in PY8 were challenging for them. ComEd program managers and implementers should be cognizant of any effects this may have on distributor participation.

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 had multiple conversations and email exchanges with program staff as part of this evaluation. These interviews focused on the programmatic changes that went into effect in PY7 and the impact these changes had on program participation and impacts. The evaluation team also organized a conference call between the program implementer, the BILD Program manager, several participating distributors, and the evaluation team where customer information data collection strategies were discussed.

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.

A total of 61 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 63 percent of all CFLs, 89 percent of all LEDs, and 90 percent of all linear fluorescent lamps sold through the program in PY7. 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	87	100%
Completed Surveys	61	70%
Invalid E-mail	1	1%
Partial Completes	8	9%
No Response	17	20%

Source: Navigant Evaluation Team Analysis of Distributor Survey Data

7.1.1.3 Program End User Telephone and Web Surveys

The evaluation team conducted telephone and web-based surveys with a random sample of end use customers who purchased lighting through the PY7 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 during August and September, 2015. The original goal was to conduct a total of 500 end-user surveys. This target was based on the number of completes that would be necessary for 90/10 confidence for each primary bulb type (CFLs, LEDs, and LFs). As has been noted in prior evaluations, the tracking data did not contain contact information for the program end-users and thus it was requested from program distributors, which is a cumbersome, labor intensive, expensive, and inexact process. In spite of this, the team was able to assemble contact information for 5,253 unique end-users (of approximately 8,000 to 9,000 BILD Program customers). Of these 5,253 end-users, 224 completed phone surveys and 159 completed web surveys for a combined sample of 383. Based on this completion rate (less than 10 percent), contact information for nearly 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.

Survey Disposition

Table 7-2 and Table 7-3 show the final disposition resulting from calling and sending web surveys to 5,253 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. Web surveys and email reminders were sent multiple times throughout the survey period. In total, 383 surveys were completed in PY7 (up from 282 in PY6).

Table 7-2. End User CATI Survey Disposition

Call Disposition	End User Survey	%
Sample Pulled	3,572	100%
Completed Surveys	224	6%
Partial Completes	44	1%
Refusal	441	12%
No answer/answering machine/busy/call back, unable to complete	1922	54%
Disconnected/wrong number, blocked	197	6%
Sample pulled, not called	590	17%
Not Eligible ³⁰	154	4%

Source: Navigant Evaluation Team Analysis of End user Survey Data

³⁰ 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.

Table 7-3. End User Web Survey Disposition

Web Survey Disposition	Distributor Survey	%
Sample Pulled	1682	100%
Completed Surveys	159	9%
Invalid E-mail	348	21%
Partial Completes	122	7%
No Response	1053	63%

Source: Navigant Evaluation Team Analysis of End user Survey Data

7.1.2 Evaluation Research Gross Parameter Estimates

Table 7-4 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 7-5 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 specialty CFLs and LED lamps. For specialty CFLs, the overall evaluation research delta watts value for this product class is 2 percent lower than verified savings. This is due to the misapplication of the TRM for some globe, candelabra, and reflector lamps.
- The evaluation research overall hours of use estimate is 10 percent higher than verified savings. The verified savings estimate is based on the “Miscellaneous” business type in the TRM whereas evaluation research applies a residential / non-residential split and uses hours of use estimates specific to the business type distribution identified in the tracking data. Similarly, energy and demand interactive effects and summer peak coincidence factors differed slightly from verified savings when residential / non-residential split and business type weightings were applied.
- Evaluation Research estimated residential / non-residential split was found to be 1 percent / 99 percent for lamps (CFLs and LEDs) and 0.1 percent / 99.9 percent for fixtures (applicable to LED fixtures, linear fluorescent lamps, and linear fluorescent ballasts). The deemed values for residential / non-residential split are 17 percent / 83 percent for lamps and 2 percent / 98 percent for linear fluorescents. The evaluation research residential / non-residential split is based on bulb weighted end-user self-reported installations, collected during the PY7 end-user surveys, in multi-family living spaces. The 3-year rolling average residential / non-residential split recommended below shows a shift towards non-residential installations.
- Evaluation research estimated installation rates were found to be 4 percent lower 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 PY7 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.³¹

³¹ Due to the low number of HID bulbs and linear fluorescent ballasts sold, it was not possible to conduct telephone surveys with a reasonably large sample of end-users. While HID lamps and LED lamps are used for very different

Table 7-4. Evaluation Research Gross Savings Parameters by Distribution Channel

Gross Impact Parameters	Bulb Type	PY7 Evaluation Research	
		Retail	Distributor
Program Sales	Standard CFLs	140,292	138,797
	Specialty CFLs	453	261,040
	LED Bulbs	36,816	947,166
	LED Fixtures	19,605	88,924
	LED Exit Signs		
	Linear FL	0	791,443
	HID	0	2,025
	Ballasts	0	67,331
	Battery Chargers	0	160
	All Bulbs	197,166	2,313,523
Delta Watts	Standard CFLs	29.3	37.3
	Specialty CFLs	50.0	30.4
	LED Bulbs	43.0	43.9
	LED Fixtures	38.5	47.0
	LED Exit Signs		20.2
	Linear FL	-	4.5
	HID	-	71.8
	Ballasts	-	4.5
	Battery Chargers		330.7
	All Bulbs	32.8	27.4
Installation Rate	Standard CFLs		85%
	Specialty CFLs		85%
	LED Bulbs		79%
	LED Fixtures		79%
	LED Exit Signs		100%
	Linear FL		97%
	HID		79%
	Ballasts		97%
	Battery Chargers		100%
	All Bulbs		86%
Leakage	All Bulbs		0.07%
Res/Non-Res	CFL and LED Bulbs		1% / 99%
	LF, Ballasts, LED Fixtures		0.1% / 99.9%
	LED Exit Signs, HID		0%/100%
Carryover Bulbs	PY5 and PY6 Sales		326,926

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

applications, they are both often used in niche applications where the installation rates may be similar. As HID lamps make up approximately 0.5 percent of program bulb sales, this assumption has little impact on the overall installation rate.

Table 7-5. Evaluation Research Gross Savings Parameters by Install Location

Gross Impact Parameters	Bulb Type	PY7 Evaluation Research	
		Res	Non-Res
Hours of Use	Standard CFLs		3424
	Specialty CFLs	938	3498
	LED Bulbs		3225
	LED Fixtures	1,010	4535
	LED Exit Signs	NA	8766
	Linear FL	1,010	4643
	HID	NA	4449
	Ballasts	1,010	4698
	Battery Chargers	NA	8372 / 8216 / 8736
Summer Peak CF	Standard CFLs		0.64
	Specialty CFLs	0.10	0.67
	LED Bulbs		0.70
	LED Fixtures		0.68
	LED Exit Signs	NA	1.00
	Linear FL	0.10	0.72
	HID	NA	0.71
	Ballasts	0.10	0.74
	Battery Chargers	NA	0.30
Winter Peak CF	Standard CFLs		
	Specialty CFLs	0.12	0.55
	LED Bulbs		
	LED Fixtures		
	LED Exit Signs	NA	1.00
	Linear FL	0.12	
	HID	NA	0.55
	Ballasts	0.12	
	Battery Chargers	NA	0.30
Interactive Effects (Energy / Demand)	Standard CFLs		1.24 / 1.45
	Specialty CFLs	1.06 / 1.11	1.26 / 1.42
	LED Bulbs		1.24 / 1.42
	LED Fixtures		1.25 / 1.37
	LED Exit Signs	NA	1.25 / 1.42
	Linear FL	1.06 / 1.11	1.25 / 1.41
	HID	NA	1.23 / 1.45
	Ballasts	1.06 / 1.11	1.26 / 1.42
	Battery Chargers	NA	varies

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

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 PY7 was estimated to be 1 percent / 99 percent for CFLs and LED bulbs and 0.1 percent / 99.9 percent 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 PY7 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 7-6 below shows the installation rates based on the end-user surveys.

Table 7-6. End User Survey Installation Rate

Population	Installation Rate	Lower 90% CI	Upper 90% CI	N Respondents	N Bulbs	N	N Bulbs
Overall Weighted ³²	86%	83%	89%	374	411,691	40,677	2,424,536
Bulb Type	CFL	85%	76%	91%	70	39,869	10,162
	LED ³³	79%	74%	83%	235	120,676	26,609
	Linear	97%	93%	100%	69	251,146	3,906
< 50	CFL	78%	63%	94%	20	351	8,490
	LED	97%	94%	99%	128	2,323	23,109
	Linear	82%	68%	96%	20	573	1,448
≥ 50	CFL	85%	76%	93%	50	39,518	1,672
	LED	73%	65%	80%	107	118,353	3,500
	Linear	97%	93%	101%	49	250,573	2,458

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

The survey results indicate an overall installation rate of 86 percent. When disaggregated by bulb type, linear fluorescents have the highest installation rate (97 percent), followed by CFLs (85 percent), and LEDs (79 percent). Respondents purchasing fewer than 50 LED bulbs reported an average installation rate of 97 percent, whereas those purchasing 50 or more bulbs installed 73 percent, a statistically significant difference. Installation rates for respondents purchasing CFLs and linear fluorescents were not statistically different based on the quantity of bulbs purchased.

7.1.2.6 Leakage

Based on the end-user telephone interviews conducted for the PY7 evaluation, leakage of program bulbs outside of ComEd territory appears to be a very small issue for the BILD Program. Of the 374 respondents, only seven 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 was approximately 0.07 percent of the total bulbs purchased by survey respondents.

7.1.3 Evaluation Research Gross Impact Findings

The total PY7 BILD Program evaluation research gross savings is estimated to be 231,382 MWh, 51.5 peak summer MW, and 41.3 peak winter MW. Table 7-7 shows evaluation research gross savings by program (retail and distributor) and presents the evaluation research Gross Realization Rates (GRR)³⁴ that are

³² 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.

³³ Because the installation rates for LED transactions < 50 and ≥ 50 were statistically different based on the end-user surveys, the installation rate for LEDs was weighted by the overall number of LEDs sold in each of these buckets.

³⁴ The Evaluation Research Gross Realization Rates are equal to the Evaluation Research Gross Savings estimate / Verified Gross Savings estimate.

associated with these impact estimates. The evaluation research GRRs show that evaluation research estimated savings are higher than verified savings for both the retail and distributor portions of the BILD Program. These differences are primarily due to the residential / non-residential split estimated through evaluation research being more heavily skewed toward non-residential installations than indicated by the deemed parameters in the IL TRM. Non-residential installations have much higher hours of use and energy interactive effects values, which leads to increased gross MWh savings. Similarly, non-residential installations have higher demand interactive effects and peak coincidence factors, resulting in higher summer and winter peak demand savings estimates.

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

	Gross MWh Savings	Gross Summer Peak MW Savings	Gross Winter Peak MW Savings
Retail Channel			
Standard CFLs	14,704	3.2	2.8
Specialty CFLs	84	0.0	0.0
LED Lamps	4,958	1.2	1.0
LED Fixture	3,380	0.6	0.4
Total	23,126	5.0	4.2
Evaluation Research GRR	121%	117%	116%
Distributor Channel			
Standard CFLs	18,561	4.1	3.5
Specialty CFLs	29,462	6.4	5.2
LED Lamps	130,373	32.4	25.4
LED Fixture	18,690	3.1	2.5
LED Exit Sign	3,689	0.5	0.5
Linear Fluorescent	20,222	3.5	2.7
CMH	628	0.1	0.1
Ballasts	1,750	0.3	0.2
Battery Chargers	441	0.1	0.1
Total	223,817	50.3	40.2
Evaluation Research GRR	106%	108%	102%
Retail and Distributor Channels			
Total	246,943	55.4	44.4
Evaluation Research GRR	107%	109%	103%

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

7.1.4 Evaluation Research Net Impact Findings

7.1.4.7 Net-to-Gross Ratio

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 PY7, 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 web surveys of program lighting distributors.

The end-user in depth interviews were conducted to collect 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 CFL, LED, or linear fluorescent bulbs 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 7-8, the overall end-user self-reported NTGR estimate across all PY7 bulb types was estimated to be 0.74, 0.10 of which was the result of participant spillover. The table below also provides NTGR estimates by bulb type and shows how LEDs again in PY7 had the highest NTGR estimate and, CFLs had the lowest NTG estimate. Spillover in PY7 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 7-8. End User Customer Self-Reported NTGR

Population	N	Program Bulb Sales	NTGR w/o Spillover	Spillover	NTGR w/ Spillover	
Overall Weighted	386	2,316,007	0.64	0.10	0.74	
Bulb Type	CFLs	72	540,582	0.54	0.10	0.64
	LEDs	272	983,982	0.68	0.10	0.78
	Linear FL	72	791,443	0.65	0.10	0.75

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 involved scoring each of the survey respondents using the free-ridership (FR) scoring algorithm which assigns a bulb type specific FR estimate to each program participant.³⁵ Each of these scores were manually reviewed along with open-end responses and thorough consistency checks were performed to verify that the assigned FR estimate was appropriate for each respondent. 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 a different FR score was assigned based on their other responses. The evaluation team also conducted in depth NTGR focused interviews with a few key program participants³⁶ to be able to better assess, through a professional interview, the impact the program had on their bulb purchases.

Once NTGR scores were calculated for each survey participant, the bulb type specific participant groups were segmented by a number of different segmentation variables (provided in the section below). 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

As shown in Table 7-9, segmentation of the surveyed respondents by the volume of CFLs they were purchasing yielded NTGR estimates that were similar across all of the segmentation categories, where respondents who purchased less than 100 bulbs or more than 500 bulbs had a NTGR score of 0.54 and respondents who purchased between 100 and 500 bulbs had a NTGR of 0.55. 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 0.54 for program CFLs. This was only one of several weighting strategies examined. The simple average, overall bulb weighted average, bulb weighted average within each bin (less than 100, 100-500, more than 500), business type weighting, and contractor/non-contractor weighting (described below), all produced NTG scores in the 0.53 to 0.56 range.

Table 7-9. 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	36%	0.54
Program Participants buying between 101-499 bulbs	19%	0.55
Program Participants buying more than 500 bulbs	45%	0.54
Overall Bulb-Weighted CFL NTGR Estimate		0.54

Source: Evaluation Team Analysis of End user Survey Data

³⁵ 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.

³⁶ The in-depth end-user interviews were focused on participants purchasing LEDs or Linear Fluorescent bulbs.

LED NTGR Analysis

Analysis of the respondent specific LED NTGR estimates (without spillover) 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 7-10, segmentation of the surveyed respondents by the type of customer yielded NTGR estimates that ranged from a high of 0.75 for lighting retrofit contractors to a low of 0.55 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 0.68 for program LEDs.

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

LED Segmentation	% of Program Population	EU Survey NTGR Estimate
Standard Electrical Contractors	3%	0.55
Lighting Retrofit Contractors ³⁷	15%	0.75
SBES Contractor ³⁸	15%	0.74
Retail Program	2%	0.54
Remaining Participants	65%	0.66
Overall Bulb-Weighted LED NTGR Estimate		0.68

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

Linear Fluorescent NTGR Analysis

Similarly for linear fluorescent bulbs, analysis of the individual respondent specific linear FL NTGR estimates (without spillover) 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 7-11, segmentation of the surveyed respondents by the type of customer yielded NTGR estimates that ranged from a high of 0.67 for general customers purchasing linear FL through the program lighting distributors to a low of 0.36 for a standard electrical contractors.³⁹ 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 0.65 for program linear FLs.

³⁷ The LED NTGR score for lighting retrofit contractors is based on responses from two survey participants.

³⁸ SBES contractors were not flagged in the tracking data, so the weight for SBES contractors was based on those who self-identified as a SBES contractor in the end-user survey. The estimated percentage of SBES contractors in the program population is a lower bound of the actual percentage.

³⁹ One standard electrical contractor purchased 77 percent of the linear fluorescent bulbs purchased by all of the standard electrical contractors and had a NTGR of 0.31, which largely drove the overall NTGR for standard electrical contractors who were surveyed about linear fluorescent bulbs.

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

LF Segmentation	% of Program Population	EU Survey NTGR Estimate
Standard Electrical Contractors	1%	0.36
Lighting Retrofit Contractors ⁴⁰	2%	0.53
SBES Contractor ⁴¹	23%	0.58
Remaining Participants	74%	0.67
Overall Bulb-Weighted LF NTGR Estimate		0.65

Source: Evaluation Team Analysis of End user Survey Data

Spillover

In PY7 the evaluation team used the same method to calculate spillover that was used in PY6, where the sum of all spillover bulbs purchased was divided by the total number of program bulbs purchased (of all types) by end-user survey respondents. The resulting program-wide spillover estimate increased from 7 percent in PY6 to 10 percent in PY7. As shown in Table 7-12, spillover was highest for linear fluorescent bulbs, followed by LEDs, then CFLs, based on the volume of bulbs purchased.

Table 7-12. Spillover Purchases by Bulb Type and Overall Spillover Percentage

Bulb Type	Spillover Purchases	Program Bulb Purchases by Respondents	Overall Spillover
CFLs	9,783		
LEDs	14,863		
Linear Fluorescents	25,684		
Overall Estimated Participant Spillover	50,330	499,825	10%

Source: Evaluation Team Analysis of End user Survey Data

7.1.4.9 Supplier Self-Report Method

The overall net-to-gross estimate (excluding spillover⁴²) from the BILD distributor interviews was estimated to be 0.67 which is very consistent with the results from the customer self-report method (overall without spillover = 0.64). The distributor based NTGR estimates are based upon interviews with 61 distributors who make up roughly 81 percent of overall PY7 BILD Program bulb sales. However, 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 sold was very high. This resulted in difficulty estimating spillover using this NTGR method.

⁴⁰ The LED NTGR score for lighting retrofit contractors is based on responses from one survey participant.

⁴¹ SBES contractors were not flagged in the tracking data, so the weight for SBES contractors was based only on those who self-identified as an SBES contractor in the end-user survey. Thus, the percentage of SBES contractors in the program population shown here is a lower bound of the actual percentage.

⁴² 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 7-13 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 self-reported NTGR ranged from a high of 0.7 for LEDs to a low of 0.51 for CFLs.

Table 7-13. Supplier Self-Report NTGR by Bulb Type

Supplier Self-Report NTGR	Bulb Type		
	CFL	LED	LF
n	38	60	32
Bulb-Weighted Free ridership	49%	30%	32%
NTGR Estimate (without spillover)	0.51	0.70	0.68

Source: Evaluation Team Analysis of Distributor Interview Data

7.1.4.10 Comparison of Net Impact Results across Methods

Table 7-14 presents estimated NTGR resulting from the two NTGR methods employed during the PY7 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 PY7 evaluation research results.

Table 7-14. NTGR Estimates by Evaluation Method

Evaluation Method	Data Source	CFL	LED	Linear FL	Overall
Customer Self-Report ⁴³	End user Surveys and In-depth Interviews	0.54	0.68	0.65	0.64
Supplier Self-Report ⁴⁴	Distributor Web Surveys	0.51	0.70	0.68	0.67
Spillover	End user Surveys	0.10	0.10	0.10	0.10
Customer Self-Report w/ Spillover	End user Surveys and In-depth Interviews	0.64	0.78	0.75	0.74
Recommended PY7 NTGR Estimate		0.64	0.78	0.75	0.74

Source: Evaluation analysis

Table 7-15 presents the PY7 evaluation research net energy, summer peak demand, and winter peak demand savings estimates. The evaluation research net realization rates are equal to the evaluation

⁴³ Excluding Spillover.

⁴⁴ Excluding Spillover.

research net savings estimate / verified net savings estimate and are driven primarily by the same factors as the gross realization rates from tables Table 7-7, and, to a lesser extent, by differences between evaluation research NTG values and the SAG recommended NTG used for the verified savings estimates.

Table 7-15. Evaluation Research Net Savings Estimates by Measure Type

	Evaluation Research NTG	Net MWh Savings	Net Summer Peak MW Savings	Net Winter Peak MW Savings
Retail Channel				
Standard CFLs	0.64	9,411	2.1	1.8
Specialty CFLs	0.64	54	0.0	0.0
LED Lamps	0.78	3,867	1.0	0.8
LED Fixture	0.78	2,636	0.4	0.4
Total		15,968	3.5	2.9
Evaluation Research NRR		1.25	1.21	1.20
Distributor Channel				
Standard CFLs	0.64	11,879	2.6	2.2
Specialty CFLs	0.64	18,856	4.1	3.3
LED Lamps	0.78	101,691	25.2	19.8
LED Fixture	0.78	14,578	2.4	1.9
LED Exit Sign	0.74	2,730	0.4	0.4
Linear Fluorescent	0.75	15,167	2.7	2.0
CMH	0.78	490	0.1	0.1
Ballasts	0.75	1,313	0.2	0.2
Battery Chargers	0.78	344	0.1	0.1
Total		167,047	37.7	30.0
Evaluation Research NRR		1.17	1.19	1.12
Retail and Distributor Channels				
Total		183,015	41.1	32.9
Evaluation Research NRR		1.18	1.19	1.13

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

7.2 *Detailed Process Findings*

The process evaluation of the PY7 BILD Program focused primarily on resolving some of the inherent challenges encountered when evaluating a midstream program. As described in the main report, a large portion of the evaluation activity involves end-user self-report data, which is difficult to come by in a midstream program where end-users are not directly involved in the rebate application process. The single largest process evaluation activity in PY7 was comprised of a conference call between the program implementer, the BILD Program manager, several participating distributors, and the evaluation team where customer information data collection strategies were discussed.

Additionally, in the process of collecting end-user and distributor data to support NTG estimates, a number of process-related findings were developed. These fall into two primary categories: 1) Effects of early program suspension (January 6th, 2015) and 2) attribution issues surrounding the Small Business Energy Savings (SBES) program and the BILD Program. Finally, distributor satisfaction with other elements of the BILD Program was examined.

7.2.1 **Midstream Incentive Program Data Collection Efforts**

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 low end-user survey completion rate experienced by the evaluation team (less than 10 percent), 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. This process also greatly extends the evaluation timeline, which results in a slow feedback cycle.

Following through on a recommendation from PY6, the evaluation team conducted a conference call between the program implementer, the BILD Program manager, and several participating distributors to arrive at a reasonable solution to this problem. The primary result of this phone call was that the distributors and implementers agreed that it would be a program requirement to submit a unique customer identification number along with the business name and address currently including in the program tracking data. While this would not forego the need for the evaluation team to request customer contact information (names, phone, email), it would streamline the process considerably.

In the time since this conference call, the ComEd program manager has informed the evaluation team that they were able to take this one step further and actually append customer contact information directly to the tracking data. This improvement will greatly assist the evaluation efforts and, combined with increased use of end-user web surveys introduced in the PY7 evaluation, will help the evaluation team provide more “real-time” feedback to ComEd going forward.

7.2.2 **Program Suspension**

In PY7 the BILD Program incentives were suspended five months early, ending January 6th, 2015 instead of the typical program year end on May 31st. This gave the evaluation team a unique opportunity to examine end-user and distributor behavior in the “active” period versus the “inactive” period. Many

BILD end-users make multiple purchases throughout the program year (approximately 60 percent of end-users surveyed purchased bulbs four or more times per year, with 20% purchasing weekly). Table 7-16 shows how end-users reacted to the program suspension (multiple responses allowed, percentages may not sum to 100 percent). Overall, 20 percent of respondents said that they would have purchased the same type and quantity of efficient bulbs without the discount and 25 percent said they would have purchased the same type, but fewer, efficient bulbs after the suspension. The first response indicates 100 percent free ridership while the second response indicates some additional (though unquantified) level of free ridership. These responses are generally consistent with the Evaluation Research NTG estimates presented in Section 7.1.4.

Table 7-16. End User Reactions to Early Program Suspension

Response Choices	All Bulb Types		CFLs		LEDs		LFs	
	n Responses	%	n Responses	%	n Responses	%	n Responses	%
Purchased the same type and quantity of efficient bulbs after the suspension without the discount	32	20%	6	33%	19	16%	7	33%
Purchased the same type, but fewer, efficient bulbs after the suspension	39	25%	3	17%	30	25%	6	29%
Purchased non-efficient equivalent bulbs after the suspension	18	11%	3	17%	15	13%	0	0%
Stocked up on efficient bulbs prior to the program suspension	19	12%	4	22%	14	12%	1	5%
Delayed purchases until incentives resume in June 2015	48	31%	2	11%	43	36%	3	14%
Did not need to purchase any bulbs	40	25%	5	28%	32	27%	3	14%
Other (specify)	6	4%	0	0%	3	3%	3	14%
Don't know	0	0%	0	0%	0	0%	0	0%
Refused	1	1%	0	0%	0	0%	0	0%

Source: Navigant Evaluation Team Analysis of End user Survey Data

When distributors were asked how their repeat customers reacted to the program suspension, their responses indicated a lower level of free-ridership than indicated by the end-users themselves. Table 7-17 indicates that distributors believe the large majority of their customers would not be purchasing BILD qualified bulbs in the absence of the program. On average, BILD distributors responding to the survey indicated that they observed a 29 percent reduction in CFL sales, a 56 percent reduction in reduced wattage linear fluorescent sales, and a 64 percent reduction in LED sales in the “inactive” period versus the “active” period.

Table 7-17. Distributor Assessment of End User Reactions to Program Suspension

Response Choices	All Bulb Types	
	n Responses	%
Purchased the same type and quantity of efficient bulbs after the suspension without the discount	1	2%
Purchased the same type, but fewer, efficient bulbs after the suspension	9	15%
Purchased non-efficient equivalent bulbs after the suspension	6	10%
Stocked up on efficient bulbs prior to the program suspension	3	5%
Delayed purchases until incentives resume in June 2015	34	56%
Did not need to purchase any bulbs	7	11%
Other (specify)	1	2%

Source: Navigant Evaluation Team Analysis of End user Survey Data

Finally, distributors were asked about any challenges they experienced resulting from participation in the program. While most distributors were complimentary of the program in general, nearly 40 percent of the 61 distributors surveyed indicated that the early program suspension was very difficult for their business. Highlights from those responses include:

- Increased administrative costs incurred due to setting up incentives within their sales and billing systems and then removing those incentives midway through the year.
- *“Chaos from constant changes.”*
- Lack of BILD funding leading to layoffs – *“I know a lot of people who were unemployed for at least 3-4 months and still are because of what happened end of PY7.”*
- *“It is difficult to quote a project when you don’t know if the incentive will still be there when the quote is approved. We have eaten quite a few of those instances.”*
- *“There should have been some advanced warning before the program so abruptly ended. The lack of warning created some havoc with our salespeople and our customers.”*
- *“We can no longer guarantee our quotes to our customers.”*

Similar comments were included in many of the distributor responses. Additionally, several of the in depth end-user interviews were with lighting contractors that regularly make large purchases of BILD products throughout the program year. Those respondents said that their companies focus exclusively on efficient lighting products, and they have come to rely on the BILD incentives for a large portion of their sales to clients. When the BILD Program was suspended, their businesses suffered. Those respondents all indicated that they would prefer to have lower incentives that are consistent throughout the program year than to have an unexpected suspension of the incentives altogether.

7.2.3 BILD Overlap with the Small Business Energy Savings (SBES) Program

After the PY7 evaluation year began, there was an overlap identified between the ComEd BILD Program and the ComEd Small Business Energy Savings (SBES) program. The SBES program offers free energy audits, contractor quotes and incentives for upgrades, as well as direct installation services for little to no

customer cost. Part of the SBES program includes lighting retrofits with BILD qualified products. SBES trade allies receive a combined materials and labor incentive for installing energy efficient lighting for small businesses, plus the BILD discount through a BILD distributor trade ally. In PY7, it was not possible to determine record level overlap between the two programs. Because of this, savings from any BILD qualified product installed through the SBES program was subtracted from SBES program savings, regardless of whether that product actually received a BILD discount. The BILD and SBES evaluation teams are currently conducting evaluation planning meetings to attribute gross savings between the two programs going forward.

Table 7-10 and Table 7-11 above show that at least 15 percent of LED and 23 percent of linear fluorescent BILD Program bulb sales were to SBES trade allies. Because those figures are based solely on those who identified as SBES trade allies in the BILD end-user surveys, they represent a lower bound of what the total overlap is between the two programs. LEDs and linear fluorescents made up over 70 percent of BILD Program savings in PY7 so substantial overlaps with SBES requires careful attribution of gross savings.

Attribution of net savings is important as well. Twenty-one of the end-user surveys and three in depth interviews were with SBES trade allies receiving BILD Program discounts. They were asked to rate the importance of the BILD incentive as compared to the SBES incentive for those projects receiving both. Data from the end-user surveys (web and CATI) showed low response rates to the question which showed no clear trends. The in depth interviews revealed that it was difficult for trade allies to say which incentive was more important to their overall sales – the relative importance was very project and bulb type specific. This highlights the need for increased collaboration between SBES and BILD teams for program planning / implementation and for program evaluation.

7.2.4 Distributor Satisfaction

In general, BILD trade allies speak very positively of the BILD Program. However, as described above, the most frequent negative comment from distributors relating to the BILD Program was that the program suspension was difficult for their business. Additionally, distributors provided the following feedback:

- The PY8 BILD Approved Product Lists (APLs) were not available until two days prior to the beginning of PY8 (June 1st, 2015).
- The PY7 APL changed during the program year without notification.
- Sub quality products on the PY7 APL.
- The payment timetable was too long.
- Reporting process is cumbersome and requires too much information about each transaction (22 fields). One comment was specific to some of the end-user contact parameters that were added at the request of the evaluation team.
- The program should be expanded to include additional color temperatures (27k).
- The program should be expanded to include sales to homeowners and residential contractors.
- Incentive levels changing midway through the program increased administrative costs and caused customer confusion.

7.3 *Evaluation Research Findings and Recommendations*

Evaluation Research Gross Impacts and Realization Rate

Finding 1. The evaluation research gross realization rate⁴⁵ across all bulb types was 116 percent. As compared to verified savings, evaluation research savings are higher due to a number of factors. These differences are primarily due to the residential / non-residential split estimated through evaluation research being more heavily skewed toward non-residential installations than indicated by the deemed parameters in the IL TRM. Non-residential installations have much higher hours of use and energy interactive effects values, which leads to increased gross MWh savings. Evaluation research estimated residential / non-residential split was found to be 1 percent / 99 percent for lamps (CFLs and LEDs) and 0.1 percent / 99.9 percent for fixtures (applicable to LED fixtures, linear fluorescent lamps, and linear fluorescent ballasts). The deemed values for residential / non-residential split are 17 percent / 83 percent for lamps and 2 percent / 98 percent for linear fluorescents. The evaluation research residential / non-residential split is based on bulb weighted end-user self-reported installations, collected during the PY7 end-user surveys, in multi-family living spaces. The 3-year rolling average residential / non-residential split recommended below shows a shift towards non-residential installations.

Evaluation Research Net Impacts

Finding 2. The net-to-gross ratios (NTGR) found in the PY7 evaluation are 0.64 for CFLs, 0.78 for LEDs and 0.75 for linear fluorescent lamps. These NTGRs are 6 percent lower, 1 percent higher, and 23 percent higher, respectively, than the PY6 evaluation research findings. Compared to the PY7 deemed NTG values, the PY7 evaluation research results are the same for CFLs, 11% higher for LEDs, and 33% higher for linear fluorescent lamps. The observed variability in NTGR lends further support to the PY5 and PY6 recommendations 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.

Recommendation 2. Continue to update the NTG values with a 3-year rolling average unless changes are made to the program that would warrant using a single year's NTGR estimate.

⁴⁵ The Evaluation Research Gross Realization Rate is equal to the Evaluation Research Gross Savings estimate / Verified Gross Savings estimate.

7.4 TRM Recommendations

As part of the PY7 study, research was conducted to support the IL TRM.

7.4.1 Recommendations for Updates to the IL TRM

As noted in the PY5 and PY6 evaluation reports, 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 7-18. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
Res/Non-Res Split	3% / 97% CFLs / LED bulbs 0.5% / 99.5% LED Fixtures / LF	3-year rolling average (PY5-PY7) of Evaluation Research Findings
1 st Year Installation Rate	75% CFLs 87% LEDs / HID 98% LF	3-year rolling average (PY5-PY7) of Evaluation Research Findings

Source: Evaluation team analysis.

For IL TRM v5.0, the evaluation team again recommends updating the deemed residential / non-residential 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 residential / non-residential split would be for Illinois TRM v5.0 (effective June 1, 2016 to correspond to ComEd PY9) due to the lack of Ameren IL data; however, Table 7-19 provides three years of evaluation research results for the ComEd program which could be used to estimate the statewide assumption.

Table 7-19. 3-Year Average Res/Non-Res Split for ComEd

Evaluation Program Year	CFLs/LEDs		Fixtures / LF	
	Bulbs	Res/Non-Res Rate	Bulbs	Res/Non-Res Rate
PY5	799,871	8% / 92%	515,948	1% / 99%
PY6	1,465,722	2% / 98%	955,387	0.2% / 99.8%
PY7	1,524,564	1% / 99%	899,972	0.1% / 99.9%
3-Year Weighted Average		3% / 97%		0.5% / 99.5%

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 v5.0 (effective June 1, 2016 to correspond to ComEd PY9) due to the lack of Ameren IL data, however Table 7-20 provides three years of evaluation research results for the ComEd program which could be used to estimate the statewide assumption.

Table 7-20. 3-Year Average Installation Rates for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	ISR	Bulbs	ISR	Bulbs	ISR
PY5	597,438	78%	214,754	91%	503,627	96%
PY6	705,909	64%	806,906	97%	840,903	99%
PY7	540,582	85%	1,094,536	79%	791,443	97%
3-Year Weighted Average		75%		87%		98%

Source: Evaluation team analysis.

During the PY7 study, a number of work papers were created to either correct errata or make other significant changes to the Illinois v4.0 TRM and draft Illinois v5.0 TRM. These work papers included the following (date of work paper included in parentheses):

- Update the C&I and residential lighting section with modified methods for establishing baseline wattages for MR and PAR reflector lamps (July 29, 2015)
- Clarify baseline and delta watts for reduced wattage linear T8 lamps (October 12, 2015)

7.5 NTGR Recommendations

NTGR Estimate for Future Use

The NTGR for PY7 was deemed for bulbs sold through the BILD Program based on a statewide advisory group (SAG) 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. Because program dynamics, market dynamics, and incentive levels may change from year to year, the most recent evaluation research data is typically the most representative of future program years. However, observing longer term trends in NTG values for each product class can provide insight on how program influence may be changing over time. Table 7-21 provides three years of evaluation research NTGR estimates (PY5-PY7) for CFLs, LEDs/HID and linear fluorescent bulbs, as well as the 3-year weighted averages. The evaluation team continues to observe some mild variability in evaluation research NTG results from year to year. The PY7 evaluation research finds that for CFLs and LEDs, the estimated PY7 NTG was approximately the same as the three-year rolling average (CFLs - PY7: 0.64, 3-year: 0.66; LEDs - PY7: 0.78, 3-year: 0.77). For linear fluorescents, the PY7 NTG estimate was 0.75, which is higher than the 3-year average of 0.65. It is difficult to establish the cause of the gradually increasing NTGR observed for linear fluorescents (0.56 in PY5 to 0.75 in PY7). When asked what factors are preventing customers from purchasing reduced wattage linear fluorescents instead of standard efficiency lamps, distributors consistently site cost and lack of education as the two primary factors. As the market price and incentive levels for these lamps have not changed appreciably over the PY5 to PY7 time period, it is possible that the program has influenced program trade allies (distributors) to do a better job educating their customers about the benefits of energy efficient lighting. The variability in year to year NTG research will continue to be observed to determine if there are indeed directional trends (and thus a single-year value is more appropriate) or if upwards and downwards variability would lend support to the use of a multi-year average.

Table 7-21. 3-Year Average NTGR

Program Year	CFLs		LEDs/HID		Linear FL ⁴⁶	
	Bulbs	NTGR	Bulbs	NTGR	Bulbs	NTGR
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
PY7	540,582	0.64	1,094,536	0.78	791,443	0.75
3-year Weighted Average		0.66		0.77		0.65

Source: Evaluation team analysis.

Table 7-22 provides the NTGR parameters recommended for deeming for future use, based on PY7 evaluation research. The “Other” category in Table 7-22 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

⁴⁶ These values are also used for linear fluorescent ballasts.

instance, LED exit signs would all have relatively high costs and incentives would likely cover a small fraction of overall costs.

Table 7-22. NTGR Parameters for Future Use

Parameter	Value	Data Source
NTGR	0.64 CFLs	PY7 Evaluation Research Findings
	0.78 LEDs/HID	
	0.75 Linear FL ⁴⁷	
	0.78 Other	

Source: Evaluation team analysis.

⁴⁷ These values are also used for linear fluorescent ballasts.

7.6 PJM Data and Findings

ComEd Business Instant Lighting Discount Program

Program Year 7 – June 2014 – January 6th, 2015

PY7 Ex Post Gross Evaluation Research Summer Peak Demand Savings = 55.4 MW

PY7 Ex Post Gross Evaluation Research Winter Peak Demand Savings = 44.4 MW

PY7 Carryover Ex Post Gross Summer Peak Demand Savings = 6.2 MW

PY7 Carryover Ex Post Gross Winter Peak Demand Savings = 5.8 MW

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

1. PY7 Program Bulbs Sold
2. Delta Watts
3. Residential / Non-residential Split
4. Summer Peak Coincidence Factor (Peak CF)
5. Winter Peak CF
6. Installation Rate
7. Demand Interactive Effects

7.7 Data Collection Instruments

7.7.1 PY7 Distributor Interview Guide

PY7 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 non-program qualifying bulb types. If you are not the person most knowledgeable about your organization's 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 ran from **June 1st 2014 through January 6th 2015**.

If you have any questions about this survey please contact Luke Scheidler (BILD Program Evaluator) at 510-844-2899, Sharon Madigan (BILD Program Manager) at 630-437-4638, or Steven McVoy (DNV GL Program Implementer) at 224-523-4791.

Please click on the link below to be directed to the web survey. We kindly request that you complete the survey by August 7th 2015.

[LINK](#)

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

Web Survey

Definitions

The following definitions apply to this survey:

CFL Bulbs – ENERGY STAR qualified standard spiral CFL bulbs that DO NOT have special functions such as reflectors/floods, or dimmable/3-way light levels. ENERGY STAR qualified specialty 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 ≥ 60 lumens per watt. Candelabra, globe, and MR lamps with ≥ 47 lumens per watt. PAR lamps and R lamps with ≥ 60 lumens per watt. LED trim kits (to convert a recessed down-light from incandescent to LED using an Edison base socket lamps) with ≥ 55 lumens per watt. All LED lamps must have ≥ 80 CRI.

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).



BILD PROGRAM LIGHTING INCENTIVES

Welcome to the ComEd Business Instant Lighting Discounts Trade Ally Survey. Please remember that all responses should be specific to the most recent BILD Program year, which ran from June 1st, 2014 to January 6th, 2015. 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

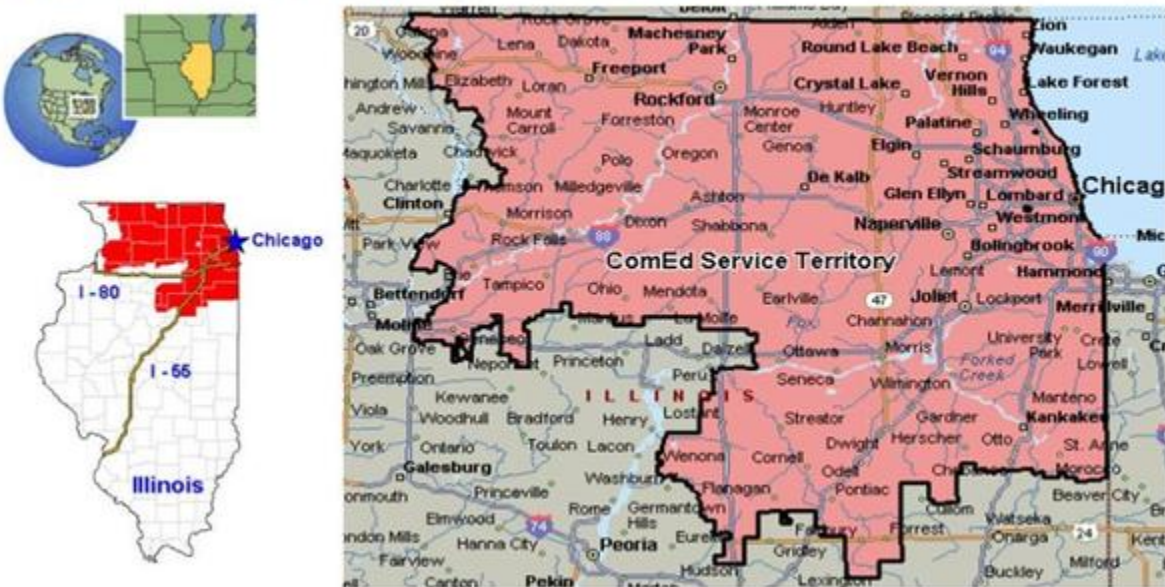
Distributor Bulb Sales

[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]

[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



2b: [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)]

2c. [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%.*

Q3_1. Incandescent/Halogen Bulbs	____%
Q3_2. CFLs	____%
Q3_4. Full Wattage Linear Fluorescent	____%
Q3_5. Reduced wattage Linear Fluorescent	____%
Q3_6. LEDs (pin or screw based)	____%
Q3_8. Other – TYPE: _____	____%

PY7 Program Bulb Sales

5. [If PY7_CFL > 0] According to our records during the most recent BILD Program year, your organization sold [PY7_CFL] CFLs through the program. If this is incorrect, please indicate the correct number:

[NUMERIC OPEN END, VER="Quantity is correct"] [Calculate V_CFL]

[User entry PY7_CFL_New][PY7_CFL = PY7_CFL_New][PY7_CFL_WRONG_flag=1]

- a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [V_CFL] CFLs would you have sold in absence of the program? [Numeric open end, MAX=100, 998=I don't know]
- b. [If Q5a < 100%] Your previous answer suggests that approximately [100% - Q40] percent of CFL sales, or [100% - Q50* V= Q5CALC2] bulbs, were directly attributable to the BILD Program. For these [Q5CALC2] CFL sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have not purchased these bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Not purchased these bulbs, Other (specify)]
- d. [If Q5a = 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 CFL sales for your organization in the past year. Is this correct? [Yes, No]
- e. [If Q5d = No] Please explain in your own words the impact of the BILD incentives and promotional materials on your organization's sales of CFLs during the past year. [Open end response]
- f. What are the primary reasons your customers provide for NOT purchasing high efficiency 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

7. [If PY7_LED > 0] According to our records during the most recent BILD Program year, your organization sold [PY7_LED] LEDs through the program. If this is incorrect, please indicate the correct number:

[NUMERIC OPEN END, VER="Quantity is correct"] [Calculate V_LED]

[User entry PY7_LED_New][PY7_LED = PY7_LED_New][PY7_LED_WRONG_flag=1]

- a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [V_LED] LEDs would you have sold in absence of the program? [Numeric open end, MAX=100, 998=I don't know]

b. [If Q7a < 100%] Your previous answer suggests that approximately [100% - Q7a] percent LED sales, or [100% - Q7a* V_LED = Q7CALC2] bulbs, were directly attributable to the BILD Program. For these [Q7CALC2] LED sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have not purchased these bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Bulbs not purchased, Other]

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 PY7_LF > 0] According to our records during the most recent BILD Program year, your organization sold [PY7_LF] REDUCED WATTAGE LINEAR FLUORESCENT BULBS through the program. If this is incorrect, please indicate the correct number:

[NUMERIC OPEN END, VER="Quantity is correct"] [Calculate V_LF]

[User entry PY7_LF_New][PY7_LF = PY7_LF_New][PY7_LF_WRONG_flag=1]

a. If the BILD incentives and promotional materials had not been available, approximately what percentage of the [V_LF] REDUCED WATTAGE LINEAR FLUORESCENT BULBS would you have sold in absence of the program? [Numeric open end, MAX=100, 998=I don't know]

b. [If Q7a < 100%] Your previous answer suggests that approximately [100% - Q8a] percent REDUCED WATTAGE LINEAR FLUORESCENT BULB sales, or [100% - Q8a* V_LF = Q8CALC2] bulbs, were directly attributable to the BILD Program. For these [Q8CALC2] REDUCED WATTAGE LINEAR FLUORESCENT BULB sales, do you think the customers would have purchased a non-efficient equivalent bulb from your organization or would they have not purchased these bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Bulbs not purchased, Other]

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

WATTAGE LINEAR 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 WATTAGE LINEAR FLUORESCENT BULBS during the past year.

f. Thinking about the T8 and T5 Linear Fluorescent bulbs your organization sold between June 2014 and January 2015, what percentage are full wattage and reduced wattage? *The percentages should add to 100%.*

1. _____ % Full Wattage
2. _____ % Reduced Wattage
98. 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
98. 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, 2014 and January 6th, 2015. Please use a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant.

- A1. ComEd's incentive program?
- A2. A policy within your organization to promote high efficiency products, independent of the program?
- A3. Your efforts to educate consumers about upfront costs vs. lifetime savings?
- A4. Customer desire to reduce energy costs?
- S5. Customer desire to reduced maintenance costs?

12. During this past program year (June 1, 2014 – January 6, 2015) 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? [1. CFLs, 3. LEDs, 4. Linear Fluorescent bulbs, 0. Other (specify)]

b_A1. [If q12a = CFLs] Can you estimate how many non-discounted CFLs you sold? [12B_B1=8 (DON'T KNOW)]

b_A3. [If q12a = LEDs] Can you estimate how many non-discounted LEDs you sold? [12B_31=8 (DON'T KNOW)]

b_A4. [If q12a = Linear Fluorescent] Can you estimate how many non-discounted Linear Fluorescent bulbs you sold? [12B_B4=8 (DON'T KNOW)]

b_A5. [If q12a=0] Can you estimate how many [Q11a open end]s you sold? [12B_B5=8 (DON'T KNOW)]

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 Suspension

The most recent program year ended approximately four months early (January 6th, 2015 instead of May 31st, 2015). The next few questions focus on how you and your customers reacted to the suspension of BILD Program discounts.

13a. Did you notice any change in the quantity of BILD qualified bulbs that you sold within ComEd's service territory during the 'active' program year (June 1st, 2014 to January 6th, 2015) and the 'inactive' program year (January 7th, 2015 to May 31st, 2015)? [Yes, No]

b. [If Q13a = yes] Please estimate the percentage increase or decrease observed in the 'inactive' period as compared to the 'active' period for each primary bulb type:

	Increase	Decrease
CFLs	__ Q13B_A1 __%	__ Q13B_B1 __%
Reduced wattage Linear Fluorescent	__ Q13B_A2 __%	__ Q13B_B2 __%
LEDs (pin or screw based)	__ Q13B_A3 __%	__ Q13B_B3 __%

14a. For repeat customers that regularly (weekly, bi-weekly, monthly, etc.) purchase BILD Program bulbs, how did most of these customers respond to the incentive suspension?

1. Purchased the same type and quantity of efficient bulbs without the discount
2. Purchased the same type, but fewer, efficient bulbs
3. Purchased non-efficient equivalent bulbs
4. Stocked up on efficient bulbs prior to the program suspension
5. Delayed purchase until incentives resume in June 2015
6. Did not purchase any bulbs
7. Other, please specify

Program Satisfaction

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 19]

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]

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:

19a_A1. CFLs

19a_A2. LEDs

19a_A3. Efficient incandescent or halogen bulbs

19a_A4. Other - specify

b. [If Q19 is 1,2,3] What are most of your customers purchasing instead of the discontinued standard 40 to 100 watt incandescent lamps? [MULTIPLE RESPONSE]

1. CFLs
2. LEDs
3. Efficient incandescent or halogen bulbs
4. Other, please specify

c. [If Q19 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.

Followup1. Is there a best time or day of the week to reach you?

Followup2. What is the best phone number to reach you at?

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

7.7.2 PY7 End User Survey Instrument

PY7 ComEd Business Instant Lighting Discount Program End User 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

CFL_NUM - total number of Screw-in CFLs sold through BILD in PY7

CFL_FLAG - 0/1 flag indicating End User was purchasing CFLs through BILD

LED_NUM - total number of LED bulbs sold through BILD in PY7

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 PY7

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.

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: “**LEDs** 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 than 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, 2014 and January 6, 2015 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, 2014 and January 6, 2015?

[NUMERIC OPEN END; 98 = DK (SHOWN ON WEB); 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, 2014 and January 6, 2015?

[NUMERIC OPEN END; 98 = DK (SHOWN ON WEB); 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, 2014 and January 6, 2015?

[NUMERIC OPEN END; 98 = DK(SHOWN ON WEB); 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

C3c. Please describe the nature of your business [OPEN END]

[If C3b= 1] then ASK C3d else SKIP C1

C3d. Are you familiar with the ComEd Small Business Energy Savings (SBES) program?

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

[If C3d = 1] then ASK C3e else SKIP C1

C3e. Are you a SBES Contractor Trade Ally?

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

[If C3e = 1] then ASK C3f else SKIP C1

C3f. For the bulbs that you purchased and installed through the BILD Program in PY7, did you receive any additional incentives through ComEd's SBES program?

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

[ASK IF C3a <> 3]

C1. Does ComEd provide electricity to your business?

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

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, 2014 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, 2014 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, 2014 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, 2014 would you estimate have been reduced wattage versus standard efficiency linear fluorescent lamps?

1. NUMERIC OPEN END; 998=DK (SHOWN ON WEB)
2. (Refused)

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

1. 00. OPEN END
8. (Don't Know)
9. (Refused)

[IF LED_NUM >0 ask C7c]

C7c. Prior to June 1, 2014 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)

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? Did you...

1. Hear about discounted bulbs from[DISTRIBUTOR] employee
2. See marketing materials in the store
3. Receive an advertisement in the mail
0. Or find out in some other way? 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) [OPEN END, keep codes below but invisible for coding]

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. (Tradeshows/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... [ROTATE] **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

N31a. The availability of the program discount of \$1.00 to \$3.00 per bulb for 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 N31i=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=3, 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... [ROTATE] **[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=2, 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... [ROTATE] **[SCALE: 0-10; 98=DON'T KNOW; 99=REFUSED]**

N33a. The availability of the program discount of \$6 to \$13 per bulb for LEDs

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=3]

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=2]

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=3]

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=2]

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 CFLs 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?

[1= Change the importance of the discount (QN31A); 2= Change the likelihood that you would purchase the same CFLs without a discount (N51); 3= Change both 4= (keep as is, those are the proper ratings) 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?

[1= Change the importance of the discount (QN32A); 2= Change the likelihood that you would purchase the same CFLs without a discount (N52); 3= Change both 4= (keep as is, those are the proper ratings); 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?

[1= Change the importance of the discount (QN33A); 2= Change the likelihood that you would purchase the same CFLs without a discount (N53); 3= Change both 4= (keep as is, those are the proper ratings); 98 = DK; 99 = REF]

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 1, 2014 and January 6, 2015.

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. 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? (

1. 100%
2. 90-99%
3. 80-89%
4. 50-79%
5. 20-49%
6. 10-19%
7. 1-9%
8. 96. 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.
8. (Don't know) [SHOWN ON WEB]
9. (Refused)

[Ask G5a IF G3a = 2 OR 3]

G5a. Why did you remove the CFL(s)? (DO NOT READ)(ACCEPT MULTIPLE) [OPEN END, keep codes below but invisible for coding]

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? [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=3, 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 1, 2014 and January 6, 2015.

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. 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?

1. 100%
2. 90-99%
3. 80-89%
4. 50-79%

- 5. 20-49%
- 6. 10-19%
- 7. 1-9%
- 8. 96. 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? ()

- 1. 100%
- 2. 90-99%
- 3. 80-89%
- 4. 50-79%
- 5. 20-49%
- 6. 10-19%
- 7. 1-9%
- 0.
- 8. (Don't know) [SHOWN ON WEB]
- 9. (Refused)

[Ask G5b IF G3b = 2 OR 3]

G5b. Why did you remove the linear fluorescent bulbs? (DO NOT READ)(ACCEPT MULTIPLE) [OPEN END, keep codes below but invisible for coding]

- 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? [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=2, ELSE SKIP TO APT1]

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 1, 2014 and January 6, 2015

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? (READ)

1. 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? (READ)

1. 100%
2. 90-99%
3. 80-89%
4. 50-79%
5. 20-49%
6. 10-19%
7. 1-9%
8. 96. 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? (READ)

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? (READ)

1. 100%
2. 90-99%
3. 80-89%
4. 50-79%
5. 20-49%
6. 10-19%
7. 1-9%
8. (Don't know) [SHOWN ON WEB]
9. (Refused)

[Ask G5c IF G3c = 2 OR 3]

G5c. Why did you remove the LEDs(s)? (DO NOT READ)(ACCEPT MULTIPLE) [OPEN END, keep codes below but invisible for coding]

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? (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] (READ)

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 APT1 = 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 APT1 = 2 or 5 and BULBTYPE = 3]

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 APT1 = 2 or 5 and BULBTYPE = 2]

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 outside 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? (READ)

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] [OPEN END, keep codes below but invisible for coding]

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 actively 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)

[ASK IF C3f = 1, ELSE SKIP TO SO1]

CONT6. You previously stated that you also received incentives through the ComEd SBES program.

- 6a. [If BULBTYPE = 1] What percentage of the <CFL_NUM> CFLs purchased through the BILD Program would you estimate also received SBES incentives? [NUMERIC OPEN END; 998 = DK; 999 = REF]
- 6b. [If BULBTYPE = 2] What percentage of the <LED_NUM> LEDs purchased through the BILD Program would you estimate also received SBES incentives? [NUMERIC OPEN END; 998 = DK; 999 = REF]
- 6c. [If BULBTYPE = 3] What percentage of the <LIN_NUM> linear fluorescents purchased through the BILD Program would you estimate also received SBES incentives? [NUMERIC OPEN END; 998 = DK; 999 = REF]

CONT7. For those purchases that received incentives through both BILD and SBES, please rate the relative importance of the BILD incentive versus the SBES incentive in your decision to install energy efficient [BULBTYPE]s rather than the standard efficiency alternative. Was the BILD incentive:

1. More influential than the SBES incentive
2. Similar in influence to the SBES incentive
3. Less influential than the SBES incentive

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 PURCH1]

SO1a. Have you purchased any non-discounted CFLs?

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 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(SHOWN ON WEB); 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 (SHOWN ON WEB); 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 (SHOWN ON WEB); 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] [OPEN END, keep codes below but invisible for coding]

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

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] [OPEN END, keep codes below but invisible for coding]

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 2014?

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 2014?

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 with the way CFLs look in a fixture

CFLBar4. Dissatisfaction with the 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; 96=NO OTHER FACTORS (SHOW ON WEB) 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; 96=NO OTHER FACTORS (SHOW ON WEB) 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; 96=NO OTHER FACTORS (SHOW ON WEB) 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, called EISA standards. The new regulations were phased in over 3 years and affect traditional 100 watt, 75 watt, 60 watt, and 40 watt incandescent lamps. These lamp types are now required to provide the same level of brightness while using approximately 30% less 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. 00. Open End
- 8. (Don't know)
- 9. (Refused)

Program Suspension and Close

The most recent program year ended approximately four months early (January 6th, 2015 instead of May 31st, 2015).

PS1. Were you aware that the BILD Program discounts were suspended in January?

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

[ASK IF PS1 = 1, ELSE SKIP TO FINAL]

PS2. Does your organization make multiple purchases of BILD qualified products throughout the year?

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

[ASK IF PS2 = 1, ELSE SKIP TO PS4]

PS3. Approximately how often does your organization purchase BILD qualified products?

- 1. Weekly
- 2. Monthly
- 3. Quarterly
- 4. Biannually
- 5. Varies
- 6. 00. Other (specify)
- 8. Don't know
- 9. Refused

PS4. How did the suspension of BILD Program discounts affect your lighting purchases? [READ]
[MULTIPLE RESPONSE]

1. Purchased the same type and quantity of efficient bulbs after the suspension without the discount
2. Purchased the same type, but fewer, efficient bulbs after the suspension
3. Purchased non-efficient equivalent bulbs after the suspension
4. Stocked up on efficient bulbs prior to the program suspension
5. Delayed purchases until incentives resume in June 2015
6. Did not need to purchase any bulbs
7. 00. Other (specify)
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. 00.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.

7.7.3 PY7 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 PY7 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.

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 before becoming aware of the discount offered by ComEd (Qn2). You also stated that that ComEd's discount lighting program was very important 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.

Data Requirements for Interviews

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

7.8 Battery Charger Workpapers

7.8.1 DNV KEMA Embedded Document



Industrial 3-Phase High Frequency Battery Charger	
Measure Description	Installation of 3-phase High Frequency Battery Charger
Units	Per unit
Base Case Description	Ferroresonant or Silicon Controlled Rectifier (SCR) Chargers

The measure consists of replacing SCR or ferroresonant chargers with high frequency chargers, or installing a new high frequency charger where no charger existed previously.

Measure Savings

The table below shows the default savings for high-frequency battery chargers. This measure savings will be a calculated for each project. The deemed savings are not used.

Table 157. Measure Savings for High Frequency Battery Chargers

Shift	kWh Savings	Coin-kW Savings
8-hour shift	1405	0.2775
16-hour shift	2588	0.2775
24-hour shift	3502	0.9251

Measure Savings Analysis

The savings for this measure are based on the application assessment report #0808 prepared for PG&E. The savings are reported based on the length of the shift, and the type of baseline technology. The savings from the different baseline technologies were averaged together, weighted according to the estimate of existing charger stock found in CA provided in the assessment report. In order to accommodate both replacement, and new construction, different savings were calculated for the two situations, the difference being that part of the market baseline for new construction included high frequency (market baseline since not mandated by code), and an assumption was made that about 75% of the units installed through the program will be replacement, and the remainder will be new units, where not existed previously.