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Business Instant Lighting Discounts Program
PY5 Evaluation Report

Final

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

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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 EPY5[1] Business Instant Lighting Discounts (BILD) Program. The BILD Program provides incentives to increase the market share of energy efficient compact fluorescent lamps (CFL), LEDs, Linear Fluorescents (LF), and High Intensity Discharge (HID) lamps sold to business customers. The BILD Program was originally called the Midstream Incentives Program, and was launched as a pilot in EPY3 and was a full scale program in EPY4. 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 program targeted lighting distributors whose customer base is predominantly end-users, as opposed to those distributors who sell mostly to contractors. In EPY5 84 distributors, at 166 unique distributor locations, are enrolled in the program.

E.1. Program Savings

Table E-1 summarizes the electricity savings from the EPY5 BILD Program.

Table E-1. EPY5 Total Program Electric Savings

Savings Category †	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	84,977	-	-
Verified Gross Savings	124,093	30.1	27.5
Verified Net Savings	91,829	22.2	20.3

Source: ComEd tracking data and Navigant team analysis.
† See the Glossary in the Appendix for definitions.

In addition to the savings resulting from bulbs purchased during EPY5, savings from bulbs purchased during the previous two program years, but not installed until EPY5 (e.g., carryover savings), can be attributed to the EPY5 program.[2] Table E-2 below provides an estimate of EPY5 Carryover bulb savings.

[1] The EPY5 program year began June 1, 2012 and ended May 31, 2013.
[2] For the EPY5 BILD program carryover bulbs came only from EPY4 since EPY3 was a pilot program year and all bulbs sold were assumed to have been installed in EPY3.

Table E-2. EPY5 Total Program Electric Savings from Carryover

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	18,990	4.0	3.2
Verified Gross Savings	12,850	3.1	2.6
Verified Net Savings	8,043	1.9	1.6

Source: ComEd tracking data and Navigant team analysis.

E.2. Program Savings by Bulb Type

Table E-3 summarizes the electricity savings from the EPY5 BILD Program by bulb type.

Table E-3. EPY5 Program Results by Bulb Type[3]

Savings Category	Stan. CFLs	Spec. CFLs	LED Bulbs	LED Fixtures	Linear FLs	HID Bulbs	Total
Ex Ante Gross Savings[4] (MWh)	n/a[5]	n/a	n/a	n/a	n/a	n/a	84,977
Verified Gross Realization Rate†	n/a	n/a	n/a	n/a	n/a	n/a	146%
Verified Gross Savings (MWh)	32,522	39,163	38,356	2,005	11,065	983	124,093
Net-to-gross ratio (NTG)†	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Verified Net Savings (MWh)	24,066	28,981	28,383	1,484	8,188	728	91,829

Source: ComEd tracking data and Navigant team analysis.
† *A deemed value.*

E.3. Impact Estimate Parameters

In the course of estimating verified gross savings, the evaluation team used a variety of impact parameters in its calculations. The majority of these parameters (delta watts, hours-of-use, peak coincidence factors, energy and demand interactive effects, and realization rates) were deemed for EPY5 based on the Illinois Technical Reference Manual v1.0[6] (IL TRM) that went into effect at the beginning of the program year. The quantity of program bulbs sold and the split of bulbs that were

[3] Excludes carryover savings.
[4] Ex Ante Gross Savings were not included in the tracking data. Ex Ante Gross Savings were based on estimates provided via email from Dave Nichols of ComEd on 8/30/2013.
[5] The evaluation calculated the Ex Ante Gross Savings by dividing the Ex Ante Net Savings provided by ComEd by the NTGR. The Gross Savings estimates included in the program tracking data were not consistent with the final Ex Ante estimates or the NTGR estimates provided by ComEd.
[6] State of Illinois Energy Efficiency Technical Reference Manual. Final, As of September 14th, 2012. Effective: June 1st, 2012.

installed in residential[7] versus nonresidential locations was determined based upon evaluation research. Net savings were estimated based on the application of a NTGR that was determined based upon a Statewide Advisory Group process.[8] Complete details on the parameters used to estimate gross and net savings are included in Section 2.2.

E.4. Impact Estimate Parameters for Future Use

In the course of our EPY5 research, the evaluation team did research on parameters used in impact calculations including those deemed based on the Illinois TRM (TRM v1.0) or the Statewide Advisory Group process mentioned above. Some of those parameters are eligible for deeming for future program years and Table E-4 below presents the evaluation team's deemed parameter recommendations.

Table E-4. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
Res/NonRes Split[9] by Bulb Type	CFLs/LEDs - 7%/ 93% Fixture/LF/HID – 1%/ 99%	Up to 3-year rolling average of Evaluation Research estimates (currently EPY4 and EPY5 for CFLs/LEDs and EPY5 only for others)
Installation Rates by Bulb Type	CFLs - 75% LEDs/HID - 91% Linear FL - 96%	Up to 3-year rolling average of Evaluation Research estimates (currently EPY4 and EPY5 for CFLs and EPY5 only for others)
NTGR by Bulb Type	CFLs - 0.64 LEDs/HID - 0.70 Linear FL - 0.56	Up to 3-year rolling average of Evaluation Research estimates (currently EPY4 and EPY5 for CFLs and EPY5 only for others)

Source: Navigant team analysis.

The Res/NonRes split is included in the second update to the IL TRM Version 2.0 (Effective June 1, 2013). Including this parameter as a deemed value in the TRM helps improve the verified savings realization rate by removing the uncertainty that surrounds this estimate within the calculation of verified savings. In Version 2.0 of the IL TRM, the Res/NonRes split is deemed at 96%/4% "based on a weighted (by sales volume) average of ComEd PY3 and PY4 and Ameren PY5 in-store intercept survey results."[10] The evaluation team believes this is a typo in the TRM and that while the results are coming from residential lighting evaluations, the Res/NonRes split should have been reversed for a nonresidential program so that deemed Res/NonRes split would be 4%/96%. The evaluation team recommends updating the deemed[11] Res/NonRes split for nonresidential lighting programs annually

[7] This split reflects the customer class split, such that bulbs installed in common spaces of residential buildings are considered nonresidential as they are billed as a nonresidential customer class.
[8] http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd EPY5-EPY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework-1.html
[9] Residential/Nonresidential (Res/NonRes)
[10] IL TRM Ver. 2.0 at p. 500.
[11] In accordance with the TRM this deemed value will only be used "if the implementation strategy does not allow for the installation location to be known".

based on research conducted specifically for nonresidential lighting programs utilizing a rolling 3-year[12] average from the most recent applicable ComEd and Ameren evaluation research.

At this time it is not possible to estimate what the statewide deemed Res/NonRes split would be for Version 3.0 due to the lack of Ameren IL data; however, Table E-5 below provides two years of ComEd evaluation research results for CFLs and LEDs and one year of ComEd evaluation research results for Fixtures, Linear Fluorescents, and HID bulbs which can be used to come up with a statewide estimate.

Table E-5. Recommended Residential/Nonresidential Split for ComEd

Evaluation Program Year	CFLs/LEDs		Fixtures/LF/HID	
	N	Res/NonRes Rate	N	Res/NonRes Rate
EPY4	575,252	6% / 94%	n/a	n/a
EPY5	799,871	8% / 92%	515,948	1% / 99%
2-year Weighted Res/NonRes Split for EPY7		**7% / 93%**		**1% / 99%**

Source: Navigant team analysis.

Version 1.0 and 2.0 of the IL TRM cite the source of first-year Installation Rate of standard and specialty CFLs as a "review of EPY1-EPY3 evaluations from ComEd and Ameren (see 'IL RES Lighting ISR.xls' for more information. The average first-year ISR for each utility was calculated weighted by the number of bulbs in the each year's survey. This was then weighted by annual sales to give a statewide assumption." The evaluation team recommends updating the deemed installation rates for BILD program bulbs annually based on a rolling 3-year average[13] from the most recent BILD evaluation research findings. This would insure the deemed installation rates are reflective of the most recent data available. As shown in Table E-6 below, at this time there is only two years of evaluation results for CFLs and one year of results for the other bulb types, and thus the recommended TRM ISRs for PY7 are based off less than 3 years of results. The table below also provides the recommended 2nd and 3rd year installation rates of the remaining bulb that are not installed in EPY7. The 1st, 2nd and 3rd year ISRs sum to 98% and the breakdown between the 2nd and 3rd year installs is based upon the 54%/46% estimates that are currently used within the IL TRM.

[12] It should be noted that we recommend averaging up to 3-years of findings if they are available and applicable. Currently 3 years of evaluation research are available for ComEd, however the PY2 findings are based off of a Pilot program and thus should not be included as they are not representative of the program in its current form.
[13] Average of most recently available evaluation data, up to 3 years.

Table E-6. Recommended Installation Rate for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	ISR	Bulbs	ISR	Bulbs	ISR
EPY4	575,252	73%	n/a	n/a	n/a	n/a
EPY5	597,438	78%	214,754	91%	503,627	96%
1st Year Weighted ISR for EPY7		**75.2%**		**90.7%**		**96.4%**
2nd Year ISR (PY8)		**12.3%**		**3.9%**		**0.9%**
3rd Year ISR (PY9)		**10.5%**		**3.3%**		**0.7%**

Source: Navigant team analysis.

The NTGR for EPY5 was deemed based on a Statewide Advisory Group process. This process historically has been referencing the most recently available evaluation-based NTGR estimate as one of the primary inputs for the deemed NTGR estimate. The evaluation team recommends utilizing a weighted rolling 3-year average[14] of the evaluation based NTGR estimate going forward in this process. This rolling average would provide some consistency from year to year and would ensure that the NTGR results from any one single year do not drastically alter the resulting net savings. Table E-7 below provides the available evaluation research NTGR estimates for CFLs, LEDs/HIDs and Linear FL bulbs, as well as the 1- or 2-year weighted average which is the recommended NTGR parameter estimate for future deeming.

Table E-7. Recommended NTGR for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	NTGR	Bulbs	NTGR	Bulbs	NTGR
EPY4	575,252	0.63	n/a	n/a	n/a	n/a
EPY5	597,438	0.66	214,754	0.70	503,627	0.56
NTGR Recommendation		**0.64**		**0.70**		**0.56**

Source: Navigant team analysis.

E.5. Participant Information

Table E-8 below shows that a total of 1,315,819 bulbs were sold through program distributors across all bulb types in EPY5. Applying the deemed installation rates to these bulb sales results in a total of 1,014,758 EPY5 bulbs installed during the program year. An estimated 78,344 additional bulb installations stemming from prior program year bulb sales (EPY4 only as all EPY3 bulbs were assumed to have been installed) leads to a total of 1,093,102 high efficiency bulbs sold through the BILD (or MSI) Lighting program being installed within ComEd service territory in EPY5.

[14] Average of most recently available evaluation data, up to 3 years.

Table E-8. EPY5 Primary Participation Detail

	Stan. CFLs	Spec. CFLs	LED Bulbs	LED Fixtures	Linear FL	HID	Total
EPY5 Program Sales	249,799	347,639	202,433	9,522	503,627	2,799	1,315,819
EPY5 1st Year Installs	173,610	276,373	202,433	9,522	350,021	2,799	1,014,758
EPY3 Carryover Bulbs	0	0					0
EPY4 Carryover Bulbs	26,445	51,898					78,344
Total Installed in EPY5	200,056	328,271	202,433	9,522	350,021	2,799	1,093,102

Source: ComEd tracking data and Navigant team analysis.

E.6. Conclusions and Recommendations

The goal of the Business Instant Lighting Discounts program for EPY5 was to save 32,700 MWh through the sale of CFLs, LEDs, high efficiency Linear Fluorescents, and Metal Halide bulbs to commercial customers within ComEd's service territory. The program provided incentives for a total of 1,315,819 bulbs and fixtures, which resulted in the program surpassing their targeted net energy savings goal by approximately 180% (91,393 MWh).

Program Savings Goals Attainment

Finding 2. The evaluation also found the program significantly exceeded the Ex Ante savings estimates, with gross and net Verified Savings realization rates of 146% (these realization rates are Verified Savings / Ex Ante Savings). Verified Savings installation rates (IR) were 11% higher than the Ex Ante IR due to the fact that the Ex Ante estimates were based on a single installation rate across all bulb types, whereas the Verified Savings estimate used deemed TRM installation rates that varied by bulb type. It is difficult to ascertain the complete difference between the Verified Savings and Ex Ante estimates due to the lack of accurate Ex Ante[15] savings estimates in the tracking data.

Recommended Changes to Deemed Parameter Estimates

The results of the evaluation research conducted in EPY5 led the evaluation team to make a series of recommendations for changes to Verified Savings parameter estimates going forward. These recommendations include:

Recommendation 2A. Updating the Res/NonRes split (included in the TRM effective v2.0) annually using a 3-year[16] rolling average of Evaluation Research estimates,

Recommendation 7B. Updating the deemed installation rates for BILD program bulbs annually based on a rolling 3-year average[17] from the most recent BILD evaluation research findings,

Recommendation 7C. Updating the NTGR (determined currently through a Statewide Advisory Group process) using a weighted rolling 3-year average[18] of the evaluation based NTGR estimate.

[15] Ex Ante savings estimates were provided in the tracking data but they did not align with the final overall program Ex Ante savings estimates.

[16] Up to 3-years based on the availability of relevant data from prior program cycles.

[17] Average of most recently available evaluation data, up to 3 years.

[18] Average of most recently available evaluation data, up to 3 years.

Tracking Data Recommendations

Finding 5. While a requirement for all distributors' participation in the BILD program is to provide detailed customer information for all program sales, the tracking data in its current form is missing for several key elements necessary for program impact estimation and evaluation.

Recommendation 5A. Continued improvements to tracking data, such as including measure level ex ante savings estimates, customer phone number and business type, specialty and reflector bulb type, and flags indicating bulb dimmability, will improve the accuracy of reported results and allow for realization rates to be estimated by bulb type.

Program Costs

Finding 6. EPY5 saw large increases in the incentive cost per unit of energy, demand, and peak demand savings over EPY4. The addition of linear fluorescent lamps in EPY5 contributed substantially to a lower program-wide delta watts estimate, which in turn led to large increases in the incentive cost per unit of energy, demand, and peak demand savings over EPY4. However, adding linear fluorescents, LEDs and HID bulbs increased the overall PY5 installation rate by 20% which made the increase in cost per unit of energy and demand savings over EPY4 much less severe.

Recommendation 6. Program planners should continue to carefully examine the effects of including additional bulb types on all impact parameters and balance these effects against incentive dollar allocation to manage the portfolio cost effectiveness targets in future program years.

Distributor Satisfaction and Barriers to Participation

Finding 8. Data gathered during the PY5 data collection efforts found that distributors are generally satisfied with the program, as well as with the incentives offered for program bulbs. The primary barrier reported by distributors is knowing the precise products that qualify for program discounts.

Recommendation 8. To overcome this barrier the evaluation team recommends that ComEd develop the list of qualifying products for each program year as soon as possible.

Program Marketing and Barriers to Efficient Lighting Purchase

Finding 9. The evaluation team found that there is room for greater use of the marketing materials provided by the program to distributors (seven of the ten distributors interviewed reported using them and 57% of end-users surveyed reported awareness of them). These materials clearly present the incentives that are offered by ComEd[19] and hypothetical[20] annual monetary savings the end-users can realize by switching to energy efficient lamps. Including similar hypothetical information on pay-back period (which for most program bulbs are less than a year) and life-time costs for program bulbs may assist customers overcome the upfront cost barrier reported by some participants.

Recommendation 9. The evaluation team recommends that ComEd provide additional training for distributors that emphasize how to effectively market the program to customers using the program materials and the discounts available for qualified products. ComEd is encouraged

[19] The evaluation found 20% of end-users who purchased discounted bulbs through the BILD program were unaware of the discount.

[20] Based on average energy rates and annual hours of operation.

to consider expanding the marketing materials to include comparisons between standard and high efficiency bulbs for each category of bulb sold through the program to help distributors better promote the options available. Since there is an energy efficient option for nearly every situation, it is important that distributors make their customers aware of all the options available so they do not simply purchase what is already in the fixture.

Bonus Program Results

Finding 10. The evaluation found that while the bonus program offered in EPY5[21] appeared to be successful with nine distributors achieving their targeted goal,[22] an analysis comparing the distributors who received the bonus incentive to those who were not offered the bonus program (but had sales in both the regular period and the bonus period) found that the increase in energy savings during the bonus period was significantly higher for distributors who were not offered the bonus program than for those who were offered the bonus and actually received it (66% versus 42%). This is counterintuitive, especially given that the bonus program period was only four months whereas the regular period was eight months. While it is difficult to say why program sales were generally higher in the period after January 31st, 2013, it is clear that this trend is not unique to the bonus program participants. It is reasonable to assume that, as many of the program participants were new to the program in EPY5, it took several months for salespeople to become familiar with the program and to begin promoting the efficient bulbs.

Recommendation 10. The evaluation team cautions ComEd if a bonus program is offered in future program years, the targeted energy savings should be set much higher and should be based on historical monthly bulb sales estimates to avoid needlessly paying additional incentive payments to distributors whose sales were likely to rise on their own.

NTGR for Linear Fluorescent Bulbs

Finding 11. The evaluation found nearly 50% of the end-users purchasing program Linear FL bulbs were freeriders (leading to a NTGR of 0.56 for Linear FL bulbs). These NTGR results for Linear FL bulbs are not unexpected as they are similar to results found in prior evaluation years in ComEd service territory and elsewhere in the U.S. They also align with currently ongoing market share tracking research which is finding high levels of high efficiency Linear FL bulb sales outside utility programs. T8s have been the target of Market transformation for over 20 years across the country and recent studies have shown the volume of high efficiency T8s installed have increased substantially in the last few years both inside and outside of utility programs. They are a commodity market and prices are currently extremely competitive with standard efficiency T8s (approximately $1 incremental cost per bulb) which leads to short (< 1 year) payback periods. Improving the NTGR for these measures in an upstream program such as BILD is extremely difficult. Increasing it would likely mean a program redesign (i.e. a targeted downstream effort) or focusing the program on other less prevalent Linear FL measures (such as high efficiency T5's for appropriate uses).

Recommendation 11A. If the measure does not meet program cost effectiveness requirements with lower NTGR estimates, ComEd should consider focusing the BILD program more on

[21] The bonus program was offered to a subset of the distributors (12 in total) that sold bulbs totaling more than an estimated one million kWh savings (based upon ComEd's Ex Ante Gross Savings estimates) as of January 31, 2013.

[22] These nine distributors received a total of nearly $200,000 in additional incentive payments.

emerging LED technologies which have higher NTGR estimates, and move the Linear FL program away from an incentive program to more of an educational program focused on the energy and monetary savings (and low payback period on investment) resulting from high efficiency T8 purchases in the absence of incentives. This also has the advantage of moving the program focus – appropriately – toward support of a newly emerging technology rather than on a technology that has been in the market for 5-10 years and is already well-established.

Recommendation 11B. The evaluation team recommends conducting additional in-depth interviews with BILD program participants who are purchasing large quantities of RW T8s to gather additional data to further explain and validate the moderate NTGR estimates found from both distributor and end-user research in PY5.

Complete findings and recommendations are included in Section 6.

1. Introduction

1.1 Program Description

The Non-Residential BILD Program provides incentives to increase the market share of energy efficient compact fluorescent lamps (CFL), LEDs, Linear Fluorescents and High Intensity Discharge (HID) lamps sold to business customers. The BILD Program was originally called the Midstream Incentives Program, and was launched as a pilot in EPY3 and was a full scale program in EPY4. 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 program targeted lighting distributors whose customer base is predominantly end-users, as opposed to those distributors who sell mostly to contractors. In EPY5, 84 distributors, at 166 unique distributor locations, are enrolled in the program.[23]

At this time the program provides incentives on a mix of standard, specialty, high wattage and cold cathode CFLs, LEDs (lamps and fixtures), Linear Fluorescents and High Intensity Discharge (HID) lamps. The EPY5 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) $8,
- LED trim kit $13,
- Linear fluorescent $1, and
- HID lamps range from $10 to $25.

In EPY5, BILD program sales came from a total of 75 unique distributor chains and 84 individual distributor locations. Comparing these sales figures to the EPY5 enrollment levels indicates a high level of program participation (88%) among enrolled distributors in EPY5.[24] EPY5 saw a substantial jump in the number of participating distributors (from 18 in EPY4), largely due to the expanded program bulb offerings, particularly linear fluorescent lamps. While there were a large number of participating distributors, the top 12 distributors made up over 75% of EPY5 sales. Table 1-1 below summarizes the number of program transactions, the number of program bulbs sold, the average size of each transaction, the total incentives paid, and the predominant bulb type sold for each of the 12 EPY5 program retailers with the highest sales volume and also the remaining distributors in aggregate. While Distributor A accounted for 16% of total bulb sales and 15% of the incentives paid, no single distributor dominated bulb sales as in EPY4.[25] The predominant bulb type sold by each of the top 12 distributors was split evenly between CFLs and linear fluorescents, while LEDs were the top seller for the remaining 63 distributors (in aggregate).

[23] These estimates came from a spreadsheet sent to the evaluation team from ComEd. An interview with the APT implementation manager indicated as of the first week of June there were a total of 81 distributors and 229 locations enrolled in the program.

[24] Based on the enrollment level provided to us in a spreadsheet from ComEd, approximately 88% of distributors sold program bulbs in EPY5 (75 distributors participated out of the 84 that were enrolled), although not all distributor locations were as likely to participate (only 51% of distributor locations sold program bulbs in EPY5, 84/166 locations) .

[25] In EPY4, the top selling distributor sold approximately 50% of all program bulbs.

Table 1-1. EPY5 Sales and Incentive Summary by Distributor

Distributor	Transactions		Avg. Bulbs / Trans.	Total Bulbs		Total Rebate		Predominant Bulb Type	
Distributor A	3,398	19%	62	211,570	16%	$546,608	15%	LF	58%
Distributor B	648	4%	312	202,105	15%	$636,495	17%	CFL	99%
Distributor C	401	2%	227	90,938	7%	$171,268	5%	CFL	93%
Distributor D	421	2%	160	67,160	5%	$108,700	3%	LF	90%
Distributor E	316	2%	205	64,750	5%	$250,051	7%	CFL	58%
Distributor F	1,696	9%	38	63,630	5%	$143,992	4%	CFL	44%
Distributor G	533	3%	114	60,666	5%	$159,589	4%	LF	77%
Distributor H	1,801	10%	33	59,318	5%	$146,890	4%	CFL	71%
Distributor I	98	1%	516	50,520	4%	$50,604	1%	LF	100%
Distributor J	1,161	6%	40	46,647	4%	$99,354	3%	CFL	59%
Distributor K	339	2%	128	43,414	3%	$104,841	3%	LF	80%
Distributor L	226	1%	172	38,973	3%	$45,453	1%	LF	91%
All Other	6,905	38%	46	316,128	24%	$1,232,681	33%	LED	37%
Total	**17,943**	**100%**	**73**	**1,315,819**	**100%**	**$3,696,526**	**100%**	**LF**	**38%**

Source: Navigant team analysis.

1.2 Evaluation Objectives

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

1.2.1 Impact Questions

1. What is the level of gross annual energy (kWh) and peak demand (kW) savings induced by the program?
2. What are the net impacts from the program? What is the level of free-ridership associated with the program and how can it be reduced? What is the spillover from the program?
3. Did the program meet its energy and demand goals? If not, why not?

1.2.2 **Process** Questions

1. What is the distributors' experience and satisfaction with the BILD Program?
2. What is the end-users experience and satisfaction with the BILD Program and program bulbs?
3. How aware are customers of the ComEd-sourced bulb discounts? How effective are the in-store promotional materials?
4. How aware are customers of changes in available lighting products as a result of EISA 2007 implementation? How do customers expect their own lighting purchasing decisions will be affected by the changes in the options available for purchase?

2. Evaluation Approach

2.1 Overview of Data Collection Activities

The core data collection activities for the evaluation of the EPY5 BILD Program included in-depth telephone interviews with key program staff and participating lighting distributors, and CATI telephone surveys with BILD end-users. The full set of data collection activities is shown in Table 2-1 below. Other primary data sources used to complete the evaluation included analysis of the program tracking database, the goals tracker spreadsheet, and the Illinois Technical Reference Manual.[26]

Table 2-1. Core Data Collection Activities

N	What	Who	Target Completes	Completes Achieved	When	Comments
Impact and Process Assessment						
1	In-Depth Telephone Interviews	Program Manager	1	1	March 2013	Data collection supporting Gross and Net impact assessment and process analysis in the same instrument.
		Program Implementer	1	1	June 2013	
		Lighting Distributors	10	10	June - July 2013	Data collection supporting Gross and Net impact assessment and process analysis in the same instrument.
2	CATI Telephone Surveys	BILD End-users	400	232	April - May 2013	Data collection supporting impact and process analysis in the same instrument.

2.2 Verified Savings Parameters

Verified Gross and Net Savings (energy, demand and coincident peak demand) resulting from the EPY5 BILD Program was calculated using the following algorithms as defined by the Illinois TRM version 1.0:

Verified Gross Annual kWh Savings = Program bulbs * Delta Watts/1000 * HOU * Energy IE* Realization Rate

[26] State of Illinois Energy Efficiency Technical Reference Manual. Final, As of September 14th, 2012. Effective: June 1st, 2012.

Where:

- Delta Watts = Difference between Baseline Wattage (incandescent wattage) and CFL Wattage
- HOU = Annual Hours of Use
- Energy IE = Energy Interactive Effects
- Realization Rate = Installation Rate

Verified Gross Annual kW Savings = Program bulbs * Delta Watts/1000 * Realization Rate
Verified Gross Annual Peak kW Savings = Gross Annual kW Savings * Peak Load Coincidence Factor * Demand IE

Where:

- 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.
- Demand IE = 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 EPY5 evaluation activities and which were deemed.

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

Input Parameters	Data Source	Deemed or Evaluated?
Program Bulbs	PY5 Program Tracking Data	Evaluated
Delta Watts	TRM v1.0	Deemed
Res / NonRes Split	PY5 End-User Survey	Evaluated
Hours of Use (HOU)	TRM v1.0 and EPY5 End-User Survey	Deemed/Evaluated
Peak Load Coincidence Factor	TRM v1.0 and EPY5 End-User Survey	Deemed/Evaluated
Energy Interactive Effects	TRM v1.0	Deemed
Demand Interactive Effects	TRM v1.0	Deemed
Realization Rate	TRM v1.0	Deemed
Net-To-Gross Ratio	Statewide Advisory Group process †	Deemed

† http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd EPY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework-1.html

2.2.1 Verified Gross Program Savings Analysis Approach

Where data allowed, the evaluation team calculated verified savings by measure. For EPY5, the evaluation team calculated verified savings for standard CFLs, specialty CFLs, LED bulbs and Linear FL bulbs. The sample sizes of LED fixtures and HID bulbs were too small to estimate separate parameters for these bulb types.

The data used to estimate the Verified Gross Program savings came from the EPY5 program tracking data, TRM v1.0, and EPY5 end-user telephone surveys. Data from the end-user telephone surveys was used to weight[27] the deemed parameters found in the TRM.

2.2.2 Verified Net Program Savings Analysis Approach

The evaluation team calculated verified net energy and demand (coincident peak and overall) savings by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). In EPY5, the NTGR estimates used to calculate the Net Verified Savings for the BILD Program were based on past evaluation research and defined through a consensus process through SAG as documented in a spreadsheet.[28] The NTGR estimates applied to calculate net savings were 0.74 for all bulb types.

2.3 Process Evaluation

The process evaluation of the EPY5 BILD program Evaluation assessed the program processes impacting distributors and end-users who participated in the program. On the distributor side, the evaluation explored sales methods and target markets, program marketing and perceived customer awareness of program, satisfaction with the program, challenges and barriers to participation, federal regulatory changes and distributor recommendations for program improvement. For end-users, the reach of program marketing, types of participating end-users, usage of and purchasing decisions for CFLs, LEDs and High Efficiency Linear Fluorescent bulbs, federal regulatory changes, program discounts, and satisfaction and barriers to purchasing program bulb types were explored. Data sources for the process evaluation include the distributor surveys (n=10) and the end-user telephone survey (n=232).

[27] Overall HOU, Peak CF and IE verified savings estimates were calculated by weighting the distinct Residential and Nonresidential estimates for these parameters found within TRM v1.0 by the EPY5 end-user telephone survey based Residential versus Nonresidential split.

[28] The spreadsheet is found at http://ilsag.info/net-to-gross-framework.html in the document titled ComEd EPY5-PY6 Proposal Comparisons with SAG.xls

3. Gross Impact Evaluation

This section presents the results of the Verified Gross Impact findings. The resulting Verified Gross savings estimate was 120,224 MWh.

3.1 Tracking System Review

The tracking data provided to the evaluation team for the EPY5 BILD program did contain measure level estimate of gross savings, however these estimate of gross savings did not align with the EPY5 deemed NTGR and the overall ComEd estimate of Ex Ante Net Savings.[29] The overall Ex Ante Gross savings reported here (84,977 MWh) were calculated by dividing ComEd's Ex Ante Net Savings estimate by the EPY5 NTGR (0.74).

The Business Instant Lighting Discounts Tracking Database included all program CFL sales invoiced after June 1, 2012. A number of data cleaning steps were taken to make sure EPY5 bulb sales were complementary and non-overlapping with bulb sales attributed to EPY4. A small number of bulbs sold in EPY4 were counted as EPY5 sales due to a delay in the invoicing of the bulbs and thus their exclusion from the bulbs counted as EPY4 sales. The EPY5 analysis dataset was finalized based on the most recent program tracking database received from ComEd (dated August 2, 2013). This dataset contained sales data for a 17,942 transactions corresponding to the sale of 1,315,819 bulbs. Of these bulbs, 1,289,954 were found to have been sold during EPY5, and 25,865 were sold during the EPY4 date range but were invoiced after the EPY4 cutoff and so are counted as EPY5 sales.

3.2 Program Volumetric Findings

The total number of bulbs sold during the EPY5 BILD Program is estimated to be 1,315,819, which is a 129% increase from the bulbs sold in EPY4. Nineteen percent of these were standard CFLs, 26% were specialty bulbs,[30] 16% were LEDs, 38% were linear fluorescents, and the remaining 0.2% was HID lamps. Standard CFL sales increased 29% and specialty CFL sales decreased 16% from EPY4 when CCFL bulbs are excluded.[31]

[29] Multiplying the sum of the measure level gross savings estimates from the tracking data by the EPY5 deemed NTGR (0.74) resulted in an overall net savings estimate that was 23% higher than ComEd's Ex Ante Net Savings estimate.

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

[31] CCFL (Cold Cathode FL) bulbs were excluded since they were not included in the program in EPY4. If they were included in the Specialty category the sales decreased by 9% from PY4.

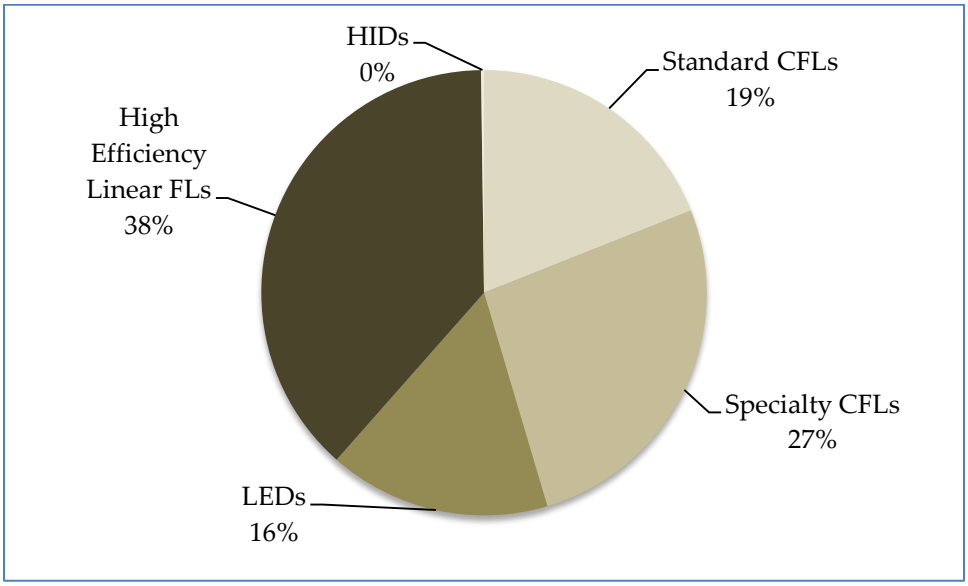
Table 3-1. EPY5 Volumetric Findings Detail

Program Year	Standard CFLs	Specialty CFLs[32]	LEDs[33]	Linear FLs	HIDs	Total
EPY5	249,799	347,639	211,955	503,627	2,799	1,315,819
EPY4	194,180	381,072	N/A	N/A	N/A	575,252
EPY3	4,173	929	N/A	N/A	N/A	5,102

Source: EM&V analysis

Figure 3-1 below shows the distribution of BILD program bulbs for EPY5.

Figure 3-1. EPY5 BILD Program Bulb Sales



Source: EM&V analysis

3.3 Gross Program Impact Parameter Estimates

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

Verified Gross Annual kWh Savings = Program bulbs * Delta Watts/1000 * HOU * Energy IE* Realization Rate

Where:

- Delta Watts = Difference between Baseline Wattage (incandescent wattage) and CFL Wattage
- HOU = Annual Hours of Use
- Energy IE = Energy Interactive Effects
- Realization Rate = Installation Rate

[32] Cold Cathode FL and High Wattage CFLs (>=40 Watts) are included in the Specialty CFL category.
[33] Includes 9,522 LED Fixtures.

Verified Gross Annual kW Savings = Program bulbs * Delta Watts/1000 * Realization Rate
Verified Gross Annual Peak kW Savings = Gross Annual kW Savings * Peak Load Coincidence Factor * Demand IE

Where:

- 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.
- Demand IE = Demand Interactive Effects

The EM&V team conducted research to estimate the Res/NonRes split that was not specified in the TRM. Other verified gross savings parameter estimates, such as HOU, Energy and Demand IE, and Peak CF were estimated by applying the Research Findings estimate of the Res/NonRes split to the deemed TRM residential and nonresidential parameter estimates. The resulting gross parameter estimates are shown in Table 3-2, below.

Table 3-2. EPY5 Verified Gross Savings Parameters

Parameter	Stan. CFLs	Spec. CFLs	LED Bulbs	LED Fixtures	Linear FLs	HID	Total
Bulb Sales	249,799	347,639	202,433	9,522	503,627	2,799	1,315,819
Delta Watts	46.9	35.5	47.5	37.3	5.6	62.3	28.1
NonRes Installs	92%	92%	92%	99%	99%	99%	95%
HOU - Res / NonRes	2.74 / 9.27	2.74 / 9.27	2.74 / 9.27	2.74 / 12.56	2.74 / 12.56	2.74 / 12.56	2.74 / 10.56
Peak CF - Res / NonRes	0.09 / 0.67	0.09 / 0.67	0.09 / 0.67	0.09 / 0.66	0.09 / 0.66	0.09 / 0.66	0.09 / 0.66
Installation Rate	69.5%	79.5%	100.0%	100.0%	69.5%	100.0%	77.1%
Energy IE - Res / NonRes	1.05 / 1.25	1.05 / 1.25	1.05 / 1.25	1.05 / 1.24	1.05 / 1.24	1.05 / 1.24	1.05 / 1.25
Demand IE - Res / NonRes	1.11 / 1.47	1.11 / 1.47	1.11 / 1.47	1.11 / 1.46	1.11 / 1.46	1.11 / 1.46	1.11 / 1.46

Source: Deemed based on TRM v1.0 and Evaluation Team analysis.

3.3.1 Development of the Verified Gross Realization Rate

The gross realization rate was 146%. This estimate was derived by dividing the Verified Gross Savings estimate by the Ex Ante Gross Savings estimate[34] (124,093/84,977= 146%).

3.3.2 Verified Gross Program Impact Results

The total EPY5 BILD Program verified gross savings is estimated to be 124,093 MWh, 30.1 MW, and 27.53 Peak MW, as shown in Table 3-3, below. These saving estimates are based on deemed parameter estimates from the TRM v1.0 and evaluation research regarding the percentage of bulbs installed in residential locations. The evaluation team verified the quantity of bulbs sold, which

[34] The Ex Ante Gross Savings estimate was estimated by dividing the Ex Ante Net Savings estimate by the EPY5 program bulb weighted Ex Ante NTGR estimate (62,883 / 0.74 = 84,977).

matched 100%. The gross Verified Savings realization rate was 146% of the Ex Ante saving estimate. A portion of this high realization rate is a result of the Verified Savings installation rates being 11% higher than Ex Ante installation rates. The Ex Ante appeared to use the same installation rate across all bulb types, whereas the Verified Savings estimate were based on the TRM installation rates that varied by bulb type and were higher for specialty CFLs and LEDs. It is difficult to ascertain the complete difference in results due to the lack of accurate Ex Ante savings estimates in the tracking data. The evaluation team was provided with a single Ex Ante net savings estimate for all EPY5 bulb sales and was unable to replicate this estimate based on the program data provided to the evaluation team.

Table 3-3. EPY5 Verified Gross Impact Savings Estimates

	Gross Energy Savings (MWh)	Gross Demand Savings (MW)	Gross Peak Demand Savings (MW)
Bulb Type Verified Gross Savings - Residential			
Standard CFLs	669	0.6	0.1
Specialty CFLs	805	0.8	0.1
LED Bulbs	789	0.7	0.1
LED Fixtures	4	0.0	0.0
Linear FL	23	0.0	0.0
HID	2	0.0	0.0
Bulb Type Verified Gross Savings - NonResidential			
Standard CFLs	31,853	7.5	7.3
Specialty CFLs	38,358	9.0	8.9
LED Bulbs	37,567	8.9	8.7
LED Fixtures	2,001	0.4	0.3
Linear FL	11,041	1.9	1.9
HID	981	0.2	0.2
Bulb Type Verified Gross Savings			
Standard CFLs	32,522	8.1	7.4
Specialty CFLs	39,163	9.8	8.9
LED Bulbs	38,356	9.6	8.7
LED Fixtures	2,005	0.4	0.3
Linear FL	11,065	2.0	1.9
HID	983	0.2	0.2
Total			
Ex-Ante EPY5 Gross Savings	84,977	n/a	n/a
Realization Rate	146%	n/a	n/a
Verified Gross Savings	124,093	30.1	27.5

Source: Evaluation Team analysis.

The BILD Program is able to claim energy and demand savings from program bulbs purchased during the two previous program years, but not installed (i.e., used by the consumer) until the current program year. In EPY3, 100% of the bulbs sold were assumed to have installed, thus in EPY5

carryover bulbs come exclusively from EPY4 sales. Table 3-4 below provides estimates of the Verified Gross savings resulting from these carryover bulbs. The realization rate shown is the percentage of the estimated Ex Ante Gross carryover Savings achieved based on the EPY5 Verified Savings estimates. As this table shows the Gross Savings realization rates are quite low (ranging from 68%-83%). The reason for these low realization rates are due to a change in the parameters used to estimate the carryover savings. The Ex-Ante PY5 Gross Savings estimate were based on the PY4 report which used DW, HOU and IE parameters based on the year of program bulb sale (i.e. PY4), however, the Verified Gross savings estimate were calculated using these same parameter estimates from the year of program bulb installation (i.e. PY5) which were significantly lower for DW and HOU and only marginally higher for IE. The net result is a reduction in estimated gross savings from these carryover bulbs.

Table 3-4. EPY5 Verified Gross Impact Savings from EPY4 Carryover Bulbs

	Gross Energy Savings (MWh)	Gross Demand Savings (MW)	Gross Peak Demand Savings (MW)
PY5 Verified Gross Carryover Savings			
Ex-Ante EPY5 Gross Savings	18,990	4.0	3.2
Realization Rate	68%	78%	83%
Verified Gross Savings	12,850	3.1	2.6

Source: Evaluation Team analysis.

4. Net Impact Evaluation

The table below shows the NTGR values deemed by SAG[35] to be used to calculate EPY5 verified net savings.

Table 4-1. EPY5 Verified Net Savings Parameters

Verified Savings Parameter	Standard CFLs	Specialty CFLs	LED Bulbs	LED Fixtures	Linear FLs	HID Bulbs	Total
NTGR	0.74	0.74	0.74	0.74	0.74	0.74	0.74

Source: http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd EPY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework-1.html

Using the deemed NTGR values, the evaluation calculated verified net savings of 91,829 MWh, 22.2 MW, and 20.3 Peak MW as shown in Table 4-2 below.

[35] http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd EPY5-PY6 Proposal Comparisons with SAG.xls

Table 4-2. EPY5 Verified Net Impact Savings Estimates

	Net Energy Savings (MWh)	Net Demand Savings (MW)	Net Peak Demand Savings (MW)
Bulb Type Verified Net Savings - Residential			
Standard CFLs	495	0.5	0.0
Specialty CFLs	596	0.6	0.1
LED Bulbs	584	0.6	0.1
LED Fixtures	3	0.0	0.0
Linear FL	17	0.0	0.0
HID	2	0.0	0.0
Bulb Type Verified Net Savings - NonResidential			
Standard CFLs	23,571	5.6	5.4
Specialty CFLs	28,385	6.7	6.5
LED Bulbs	27,800	6.6	6.4
LED Fixtures	1,480	0.3	0.3
Linear FL	8,171	1.4	1.4
HID	726	0.1	0.1
Bulb Type Verified Net Savings			
Standard CFLs	24,066	6.0	5.5
Specialty CFLs	28,981	7.3	6.6
LED Bulbs	28,383	7.1	6.5
LED Fixtures	1,484	0.3	0.3
Linear FL	8,188	1.5	1.4
HID	728	0.1	0.1
Total			
Ex-Ante EPY5 Gross Savings	84,977	n/a	n/a
Realization Rate	146%	n/a	n/a
Verified Gross Savings	124,093	30.1	27.5
NTGR	0.74	0.74	0.74
Verified Net Savings	91,829	22.2	20.3

Source: Evaluation Team analysis.

Table 4-3 below provides estimates of the verified net savings resulting from EPY4[36] carryover bulbs installed in EPY5. As the table below shows the NTGR estimate used to calculate the verified net savings for the carryover bulbs was 0.63. This estimate was the Research Findings NTGR estimate from EPY4 since there was no deemed NTGR in EPY4.

Table 4-3. EPY5 Verified Net Impact Savings from EPY4 Carryover Bulbs

	Net Energy Savings (MWh)	Net Demand Savings (MW)	Net Peak Demand Savings (MW)
EPY5 Verified Net Carryover Savings			
Ex-Ante EPY5 Gross Savings	18,990	4.0	3.2
Realization Rate	68%	78%	83%
Verified Gross Savings	12,850	3.1	2.6
NTGR	0.63	0.63	0.63
Verified Net Savings	8,043	1.9	1.6

Source: Evaluation Team analysis.

[36] There were no carryover bulbs from EPY3 since all were assumed to be installed in EPY3.

5. Process Evaluation

The process evaluation of the EPY5 BILD program Evaluation assessed the program processes impacting distributors and end use customers who participated in the program. On the distributor side, we explored sales methods and target markets, program marketing and perceived customer awareness of the program, satisfaction with the program, challenges and barriers to participation, federal regulatory changes and distributor recommendations for program improvement. For end-users, we examined the reach of program marketing, types of participating end-users, usage of and purchasing decisions for CFLs, LEDs and High Efficiency Linear Fluorescent bulbs, federal regulatory changes, program discounts, and satisfaction and barriers to purchasing program bulb types. Data sources for the process evaluation include the distributor surveys (n=10) and the end-user telephone surveys (n=232). Complete process evaluation results are presented in Section 7.4. The following list summarizes the key process findings from the study:

Distributor Participation and Sales:

Finding 1. The opportunity presented by the program to grow sales and pass savings along to customers was the primary reason the majority of distributors got involved with the program. Eight out of ten distributors said their program sales either met or exceeded their expectations. The inclusion of LEDs was an important factor in the decision to participate for seven out ten distributors who noted the growing popularity and relevance to customers. The end-user survey results suggest that EISA may increase LED usage. Approximately half (52%) of the end-users who expect to have to change their purchasing behavior anticipate replacing the phased out bulbs with LEDs.
The inclusion of linear fluorescent bulbs was slightly less important to distributors than the inclusion of LEDs. One of five distributors who sold the bulbs said the inclusion of linear fluorescents was very important to their participation while another said it was somewhat important.

Recommendation 1. As LEDs increase in popularity, the evaluation team recommends using the inclusion of LEDs as a selling point when marketing the program to distributors.

Distributor Satisfaction:

Finding 2. Distributors are generally satisfied with the program. Nearly all the distributors interviewed reported being satisfied with the program in general and with the incentives offered for program bulbs. Distributors reported high satisfaction with the program overall (9 of 10 satisfied). Satisfaction is highest with incentives offered for program bulbs (9 of 10 satisfied). Satisfaction is also high for program managers and other BILD staff, and incentive processing, and the program's impact on sales (7 of 10 satisfied). Despite the growth of the program and overall high levels of satisfaction, some barriers to distributor participation remain. One barrier to participation is knowing exactly what products qualify for program discounts. Though the program allows a wide variety of CFLs and LEDs, not all products on the market meet the lamp performance criteria required by the program. The program reporting requirements remain a barrier for distributors whose internal processes are not set up to track and easily provide the necessary information.

Recommendation 2. The evaluation team recommends that ComEd develop the list of qualifying products for each program year as soon as possible. Some distributors recommended developing this list sooner than the program has in the past because of amount of time it takes to ensure that all lighting products offered adhere to the requirements of the program. It is also important that the program is clear with distributors about the program's informational requirements. Distributors report some surprise at all that is required.

Program Marketing and Barriers to Efficient Lighting Purchase

Finding 3. The program makes use of discounts and marketing to increase the use of energy efficient lighting. Our evaluation finds that distributors could do more to make use of these tools. Seven of the ten distributors we interviewed said they used the marketing materials provided by the program. End-users who purchased bulbs through the BILD program were less likely to report seeing the ComEd marketing materials (57%). In addition, 20% of end-users who purchased discounted bulbs through the BILD program were unaware of the discount. The end-user survey results suggest that they could benefit from some additional information about their energy efficient lighting options. The responses show that end-users consider the particular installation situation (35%) when deciding what lighting to buy followed by price (28%). Since there is an energy efficient option for nearly every situation, it is important that distributors make their customers aware of all the options available so they do not simply purchase what is already in the fixture, which was response of 16% of end-users. The survey also found that 27% of end-users had purchased incandescent lighting in the past year and 34% had purchased standard efficiency linear fluorescents. Common reasons for not purchasing CFLs include bulb appearance and light quality. Price is a barrier to LED purchase. Inability to find the needed bulb is a barrier for both CFLs and LEDs. Lack of familiarity and price were barriers to the purchase of efficient linear fluorescent bulbs.

Recommendation 3. The program may want to consider additional training for distributors that emphasizes how to most effectively market the program to their customers using the materials provided by the program, as well as making customers aware of the discount. ComEd is encouraged to consider developing and sharing enhanced marketing and education materials that focus on comparing standard efficiency bulbs with higher efficiency alternatives for each of the three individual bulb categories to help distributors better promote the options available. Customers do not seem to be aware that there is an energy efficient bulb for nearly every socket. In addition, these materials should emphasize the lifetime costs of the products and the return on investment means that energy efficient bulbs are worth the upfront costs.

6. Conclusions and Recommendations

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

The goal of the Business Incentive Discount program for EPY5 was to become a comprehensive Commercial and Industrial Lighting program for ComEd. To achieve this goal, the program was expanded in EPY5 to include Linear FL, LEDs, CCFLs, and HID bulbs (all previously included in the prescriptive program). A total of 1,315,819 bulbs were sold through the program in EPY5 (a 129% increase over EPY4) resulting in an estimated energy saving of 124,093 MWh (146% of the Ex Ante estimate and 281% of the EPY5 goal). Distributor participation increased significantly in EPY5, with the number of unique distributors selling program bulbs growing from 18 in EPY4 to 75 in EPY5. The significant increase in distributor participation and program sales is largely attributable to the additional bulb types sold through the BILD program in EPY5, most notably LEDs and linear fluorescents.

Program Savings Goals Attainment

Finding 1. ComEd significantly exceeded their planning targets in EPY5 by achieving nearly 300% of their targeted Net energy savings (32,700 MWh targeted vs. 91,829 MWh Verified Savings).

Realization Rates

Finding 2. The gross and net Verified Savings realization rates were 146% of the Ex Ante saving estimate. Verified savings installation rates were 11% higher than Ex Ante due to the fact that the Ex Ante appeared to use the same installation rate across all bulb types, whereas the Verified Savings estimate were based on the TRM installation rates that were higher for specialty CFLs and LEDs. It is difficult to ascertain the complete difference in results due to the lack of accurate Ex Ante savings estimates in the tracking data. The evaluation team was provided with a single Ex Ante net savings estimate for all EPY5 bulb sales and was unable to replicate this estimate based on the program data provided to the evaluation team.

Recommendation 2a. Gross realization rates could be improved if Res/NonRes split was a deemed[37] parameter. As stated in the TRM recommendations section of this report, the evaluation team recommends deeming the Res/NonRes split based on a 3-year rolling average of Research Findings estimates and differentiated by program bulb type. For PY7 this would mean the Res/NonRes split for screw-in bulbs would be 7% / 93% and the Res/NonRes split for fixtures and linear fluorescent bulbs would be 1% / 99%.

Recommendation 2b. Although some measure level Ex Ante savings estimates were provided in the tracking data, this data did not align with the Ex Ante final overall reported numbers we received from ComEd for the EPY5 BILD program. The evaluation team recommends including accurate measure level Ex Ante savings estimates in the tracking data that align with ComEd's final Ex Ante savings estimates. Access to this data would allow for a more complete picture of the differences that exist between the Ex

[37] In accordance with the TRM this deemed value will only be used "if the implementation strategy does not allow for the installation location to be known".

Ante and Verified Savings estimates to be drawn, and would also allow for the estimation of Realization Rates by bulb type.

Impact of EISA 2007 on Marketplace

Finding 3. The majority of distributors reported their customers were very or somewhat familiar with the EISA regulations and more than half of them believed the new standards are increasing customers' awareness of energy efficient products and forcing them into purchase increased efficiency products. Despite these responses, only a few distributors reported they had changed their stocking practices due to EISA and one-third reported they still have 75- and 100-watt incandescent bulbs in stock. End-users surveyed reported lower awareness levels of EISA, which likely means EISA has not fully impacted end-user purchasing decisions given these somewhat conflicting results. Once the regulations were explained, two-thirds of end-users reported they expected the lighting products their organization installs will change with LEDs leading the way in terms of the types of bulbs that will replace incandescents.

Recommendation 3. Distributors should continue to educate customers on the EISA standards and use this opportunity, along with the incentives being offered by ComEd, to encourage customers to try CFL and LEDs in place of their incandescent bulbs.

Delta Watts Estimation

Finding 4. The EPY5 IL TRM base watt methodology takes the right approach as it uses different methods for establishing base watts for different bulb types. Despite this, the evaluation team believes there is still room for improvement.

Recommendation 4. Similar to the TRM, the evaluation team recommends establishing baseline wattage by using lumen mapping that is specific to bulb type, shape, and directionality (omni-directional, globes, directional, decorative, etc.). *Additionally*, the evaluation team recommends a technology neutral approach, meaning that lumen ranges for specific bulb types should be consistent across technologies (the current TRM, for instance, uses different lumen ranges for CFL reflector bulbs than for LED reflector bulbs and the same lumen ranges for CFL reflector bulbs and other specialty CFLs). The proposed method was first used to calculate the Evaluation Research in EPY4 and it has been included in Version 2.0 of the IL TRM which becomes effective beginning in EPY6.

Tracking Data Issues

Finding 5. While a requirement for all distributors' participation in the BILD program is to provide detailed customer information for all program sales, the tracking data in its current form is missing for several key elements necessary for program impact estimation and evaluation.

Recommendation 5A. The evaluation team recommends adding a requirement to the MOU that requires all participating lighting distributors to provide a customer phone number and business type for all program bulb sales (this is in addition to the customer name and address information already being collected and submitted to ComEd). Collecting the phone number of the individual making the lighting purchase would greatly improve the ability to evaluate the BILD Program by increasing the quantity of program participants the evaluation team is able to interview about their experience with the BILD Program. Collecting the business type of the end-users purchasing program bulbs would improve

the accuracy of estimating hours-of-use, peak coincidence factors and interactive effects for program bulb sales.

Recommendation 5B. Additionally, while the BILD lighting lookup table was updated in EPY5 to include lamp type (standard, specialty, directional, decorative, etc.), there were no fields for specialty bulb type (candelabra, globe, etc.), dimmable/non-dimmable, or reflector bulb type. To accurately determine delta watts using the evaluation recommended lumen mapping, the lookup table should include specific specialty bulb type (such as globe, A-lamp, PAR38, R20, etc.).

Recommendation 5C. The gross kWh savings parameter in the tracking database is based on the delta watts value included in the tracking database multiplied times an assumed average daily hours-of-use of 3,198 hours for all bulb types. This value for hours-of-use is provided under the miscellaneous category for screw based bulbs in the EPY5 TRM. This value is not appropriate for all bulb types and does not match the hours-of-use values provided to the evaluation team by ComEd. The gross kWh savings parameter should be calculated using the hours of use that is appropriate for the bulb type (bulb or fixture), and if possible, the business type as specified in the TRM.

Program Costs

Finding 6. EPY5 saw large increases in the incentive cost per unit of energy, demand, and peak demand savings (both gross and net) over EPY4. The EPY5 addition of linear fluorescent lamps contributed substantially to a lower program-wide delta watts estimate, which led to large increases in the incentive cost per unit of energy, demand, and peak demand savings over EPY4. However, adding linear fluorescents, LEDs and HID bulbs increased the overall PY5 installation rate by 20% which made the increase in cost per unit of energy and demand savings over EPY4 much less severe

Recommendation 6. Program planners should continue to carefully examine the effects of including additional bulb types on all impact parameters and balance these effects against incentive dollar allocation to manage the portfolio cost effectiveness targets in future program years.

Impact Parameters for Future Use

Finding 7A. The Res/NonRes split has been included in the second update to the IL TRM Version 2.0 (Effective June 1, 2013). Including this parameter as a deemed value in the TRM helps improve the verified savings realization rate by removing the uncertainty that surrounds this estimate within the calculation of verified savings. The deemed estimate in Version 2.0 is based upon the residential evaluation findings and thus it is deemed at 96% residential and 4% nonresidential[38]. This estimate is not appropriate for a nonresidential program such as BILD and should be updated with an appropriate estimate based on research in the nonresidential sector.

Recommendation 7A. The evaluation team recommends updating the deemed[39] Res/NonRes for nonresidential lighting programs annually based on research conducted specifically

[38] The evaluation team believes it is likely that the intention may have been to use the reverse of the residential findings as a proxy in the absence of data from a nonresidential evaluation (i.e. 96% nonresidential and 4% residential) but that the reverse was omitted.

[39] In accordance with the TRM this deemed value will only be used "if the implementation strategy does not allow for the installation location to be known".

for nonresidential programs utilizing a rolling 3-year[40] average by bulb type from the most recent applicable ComEd and Ameren evaluation research findings. At this time it is not possible to estimate what the statewide deemed Res/NonRes split would be for Version 3.0 due to the lack of Ameren IL data; however, Table 6-1 below provides two years of ComEd evaluation research results for CFLs and LEDs, and one year of ComEd evaluation research for LED Fixtures, Linear Fluorescents, and HID bulbs, which can be used to come up with a statewide estimate.

Table 6-1. Recommended Res/NonRes Split for ComEd

Evaluation Program Year	CFLs/LEDs		Fixtures/LF/HID	
	N	Res/NonRes Rate	N	Res/NonRes Rate
EPY4	575,252	6% / 94%	n/a	n/a
EPY5	799,871	8% / 92%	515,948	1% / 99%
Recommended Parameter Update for EPY7		**7% / 93%**		**1% / 99%**

Source: Navigant team analysis.

Finding 7B. Version 1.0 and 2.0 of the IL TRM cite the source of first-year Installation Rate of standard and specialty CFLs as a "review of EPY1-EPY3 evaluations from ComEd and Ameren (see 'IL RES Lighting ISR.xls' for more information. The average first year ISR for each utility was calculated weighted by the number of bulbs in the each year's survey. This was then weighted by annual sales to give a statewide assumption".

Recommendation 7B. The evaluation team recommends updating the deemed installation rates for BILD program bulbs annually based on a rolling 3-year[41] average from the most recent BILD evaluation research findings. This would insure the deemed installation rates are reflective of the most recent data available. As shown in Table 6-2 below, at this time there is only two years of evaluation results for CFLs and one year for the other bulb types and thus the recommended TRM updates are based on less than three years of data.

[40] Up to 3-year average if 3 years of evaluation results are available. At this time, for the Res/NonRes split, there is 2 years of evaluation data available for CFLs and only 1 year of evaluation data for Fixtures, Linear FLs, and HID bulbs. As more data becomes available it should be averaged into the recommendation so that a rolling 3-year average is used for the parameter updates.

[41] As mentioned previously, average of most recently available evaluation data up to 3 years.

Table 6-2. Recommended Installation Rates for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	ISR	Bulbs	ISR	Bulbs	ISR
EPY4	575,252	73%	n/a	n/a	n/a	n/a
EPY5	597,438	78%	214,754	91%	503,627	96%
1st Year Weighted Install Rate for EPY7		**75.2%**		**90.7%**		**96.4%**
2nd Year ISR (PY8)		**12.3%**		**3.9%**		**0.9%**
3rd Year ISR (PY9)		**10.5%**		**3.3%**		**0.7%**

Source: Navigant team analysis.

Finding 7C. The NTGR for EPY5 was deemed based on a Statewide Advisory Group process. This process historically has been referencing the most recently available evaluation-based NTGR estimate as one of the primary inputs for the deemed NTGR estimate.

Recommendation 7C. The evaluation team recommends utilizing a weighted rolling 3-year[42] average of the evaluation based NTGR estimate going forward in this process. This rolling average would provide some consistency from year-to-year and would ensure that the NTGR results from any one single year do not drastically alter the resulting net savings. Table 6-3 below provides the available evaluation research NTGR estimates for CFLs, LEDs/HIDs and Linear FL bulbs, as well as the 1- or 2-year weighted average which is the recommended NTGR parameter estimate for future deeming.

Table 6-3. Recommended NTGR for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	NTGR	Bulbs	NTGR	Bulbs	NTGR
EPY4	575,252	0.63	n/a	n/a	n/a	n/a
EPY5	597,438	0.66	214,754	0.70	503,627	0.56
Recommended Parameter Update for EPY7		**0.64**		**0.70**		**0.56**

Source: Navigant team analysis.

Distributor Satisfaction and Barriers to Participation

Finding 8. Distributors are generally satisfied with the program in general, as well as with the incentives offered for program bulbs. Despite the growth of the program and overall high levels of satisfaction, some barriers to distributor participation remain. One barrier to participation reported by distributors is knowing exactly what products qualify for program discounts. Though the program allows a wide variety of CFLs and LEDs, not all products on the market meet the lamp performance criteria required by the program.

Recommendation 8. The evaluation team recommends that ComEd develop the list of qualifying products for each program year as soon as possible. Some distributors

[42] As mentioned previously, average of most recently available evaluation data up to 3 years.

recommended developing this list sooner than the program has in the past because of amount of time it takes to ensure that all lighting products offered adhere to the requirements of the program.

Program Marketing and Barriers to Efficient Lighting Purchase

Finding 9. The program makes use of discounts and marketing to increase the use of energy efficient lighting. Our evaluation finds that distributors could do more to make use of these tools. Seven of the ten distributors interviewed reported using the marketing materials provided by the program; however end-users surveyed reported lower levels of awareness of ComEd marketing materials (57%). In addition, 20% of end-users who purchased discounted bulbs through the BILD program were unaware of the discount. The end-user survey results suggest that they could benefit from some additional information about their energy efficient lighting options. The responses show that end-users consider the particular installation situation (35%) when deciding what lighting to buy followed by price (28%). Since there is an energy efficient option for nearly every situation, it is important that distributors make their customers aware of all the options available so they do not simply purchase what is already in the fixture.

Recommendation 9. The program may want to consider additional training for distributors that emphasizes how to most effectively market the program to their customers using the materials provided by the program, as well as making customers aware of the discount. ComEd is encouraged to consider developing and sharing enhanced marketing and education materials that focus on comparisons between standard efficiency bulbs and higher efficiency alternatives for each bulb categories to help distributors better promote the options available. Customers do not seem to be aware that there is an energy efficient bulb for nearly every socket. In addition, these materials should emphasize the lifetime costs of the products and the return on investment which illustrate the energy efficient bulbs are worth the upfront costs.

Bonus Program Performance

Finding 10. The bonus program offered to the subset of 12 distributors that sold bulbs totaling more than an estimated one million kWh savings[43] as of January 31, 2013 appeared to be successful with nine distributors achieving their targeted goal and receiving a total of nearly $200,000 in additional incentive payments. An analysis comparing the distributors who received the bonus incentive to those who were not offered the bonus program (those that had sales in both the regular period and the bonus period) found that the increase in energy savings during the bonus period was significantly higher for distributors who were not offered the bonus program than for those who were offered the bonus and actually received it (66% versus 42%). This is counterintuitive, especially given that the bonus program period was only four months whereas the regular period was eight months. It is difficult to say why program sales were generally higher in the period after January 31st, 2013, but it is clear that this trend is not unique to the bonus program participants. It is reasonable to assume that, as many of the program participants were new to the program in EPY5, it took several months for

[43] Estimated energy savings were based upon ComEd's Ex Ante Gross Savings estimates.

salespeople to become familiar with the program and to begin promoting the efficient bulbs.

Recommendation 10. The evaluation team believes if a bonus program is offered in future program years, the targeted energy savings should be set much higher and should be based on historical monthly bulb sales estimates to avoid needlessly paying additional incentive payments to distributors whose sales were likely to rise on their own.

NTGR for Linear Fluorescent Bulbs

Finding 11. The evaluation found nearly 50% of the end-users purchasing program Linear FL bulbs were freeriders (leading to a NTGR of 0.56 for Linear FL bulbs). These NTGR results for Linear FL bulbs are not unexpected as they are similar to results found in prior evaluation years in ComEd service territory and elsewhere in the U.S. They also align with currently ongoing market share tracking research which is finding high levels of high efficiency Linear FL bulb sales outside utility programs. T8s have been the target of Market transformation for over 20 years across the country and recent studies have shown the volume of high efficiency T8s installed have increased substantially in the last few years both inside and outside of utility programs. They are a commodity market and prices are currently extremely competitive with standard efficiency T8s (approximately $1 incremental cost per bulb) which leads to short (< 1 year) payback periods. Improving the NTGR for these measures in an upstream program such as BILD is extremely difficult. Increasing it would likely mean a program redesign (i.e. a targeted downstream effort) or focusing the program on other less prevalent Linear FL measures (such as high efficiency T5's for appropriate uses).

Recommendation 11A. If the measure does not meet program cost effectiveness requirements with lower NTGR estimates, ComEd should consider focusing the BILD program more on emerging LED technologies which have higher NTGR estimates, and move the Linear FL program away from an incentive program to more of an educational program focused on the energy and monetary savings (and low payback period on investment) resulting from high efficiency T8 purchases in the absence of incentives. This also has the advantage of moving the program focus – appropriately – toward support of a newly emerging technology rather than on a technology that has been in the market for 5-10 years and is already well-established.

Recommendation 11B. The evaluation team recommends conducting additional in-depth interviews with BILD program participants who are purchasing large quantities of RW T8s to gather additional data to further explain and validate the moderate NTGR estimates found from both distributor and end-user research in PY5.

7. Appendix

7.1 EM&V Reporting Glossary

High Level Concepts

Program Year

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

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

Verified Savings composed of

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

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

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

Impact Evaluation Research Findings composed of

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

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

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

the body of the report and more detailed findings put in an appendix to make the body of the report more concise.)

Program-Level Savings Estimates Terms

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

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

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

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

Individual Values and Subscript Nomenclature

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

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

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

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

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

Glossary Incorporated From the TRM

Below is the full Glossary section from the TRM Policy Document as of October 31, 2012[44].

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

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

> **Measure Level Research**: An evaluation process that takes a deeper look into measure level savings achieved through program activities driven by the goal of providing Illinois-specific research to facilitate updating measure specific TRM input values or algorithms. The focus of this process will primarily be driven by measures with high savings within Program Administrator portfolios, measures with high uncertainty in TRM input values or algorithms

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

(typically informed by previous savings verification activities or program level research), or measures where the TRM is lacking Illinois-specific, current or relevant data.

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

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

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

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

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

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

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

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

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

7.2 Detailed Evaluation Research Findings and Approaches

7.2.1 Primary Data Collection

The data collected for the evaluation of the EPY5 BILD Program was gathered via in-depth telephone interviews with key program staff and lighting distributors, CATI telephone surveys with program end-users, and ComEd tracking data analysis. Table 7-1 below provides a summary of the data sources including the targeted population, the sample size and the objectives of the efforts.

Table 7-1. EPY5 Data Collection Activities

Collection Method	Targeted Population	Sample Size	Gross Impacts	Net Impacts	Process
Tracking Data	Program Participants	All	X	X	
In-Depth Telephone Interviews	Program Manager	1	X	X	X
	Program Implementer	1			X
	Lighting Distributors	10	X	X	X
CATI Telephone Surveys	BILD End-users	232	X	X	X
PY5 IL TRM	All Program Measures	All	X		

7.2.1.1 Tracking Data

The tracking data delivered for this evaluation consisted of three databases. The first database contained detailed program bulb invoice data from participating distributors, the second contained bulb-specific information such as wattage and lumens, and the third database contained higher level information and tracked cumulative weekly program bulbs sales compared to sales goals. Specifically, these databases consisted of the following:

- *BILD Incentive Tracking Database* – The Business Instant Lighting Discounts Tracking Database included all program bulb sales for all program years. The key variables in this database included the distributor name and address, the memorandum of understanding (MOU) number, the bulb description and model number, the number of program bulbs sold, the rebates paid for these program bulbs, and the date of invoice.
- *BILD Lighting Lookup Table* – The BILD lighting lookup table contained detailed bulb information for bulbs sold through the program. Key variables include lamp category (CFL, linear fluorescent, LED, etc.), lamp type (standard, specialty, directional, decorative, etc.), manufacturer specified baseline wattage, bulb wattage, bulb lumens, rated life, estimated hours of use, and estimated ex ante gross annual savings.[45]

[45] The transaction level ex ante gross savings estimates provided in this lookup table sum to an overall ex ante savings estimate for the BILD program that is significantly higher than the estimate provided to the evaluation team by ComEd.

- *PY5 Goals Tracker* - This spreadsheet tracked cumulative weekly program bulbs sales compared to sales goals and allocated program dollars. The ex ante savings estimate in this spreadsheet was significantly larger than the ex ante savings estimate provided to us from ComEd. Along with bulb sales, the record for each combination of model number and retailer included the CFL wattage, manufacturer, product description, rated life, the number of bulbs per package and the incentive requested from ComEd per package. In EPY5 it was not necessary to use this spreadsheet as all necessary evaluation parameters were included in the BILD Lighting Lookup Table.

The final tracking databases for this program were generally comprehensive and easy to use, and the model numbers from the bulb information tables matched readily to the program tracking database. There were very few instances where lumen and/or manufacturer base wattage values were missing or incorrect. While the BILD lighting lookup tables was updated in EPY5 to include lamp type (standard, specialty, directional, decorative, etc.), there were no fields for specialty bulb type (candelabra, globe, etc.), dimmable/non-dimmable, or reflector bulb type. These variables were extracted from the "Description" field for the purposes of this evaluation, but this is an imperfect process as the bulb description does not always specify the bulb type. These designations are important for establishing base wattages and would be helpful in future evaluations.

7.2.1.2 Program and Implementer Staff Interviews

The evaluation team conducted two in-depth interviews with program staff as part of this evaluation. One of these interviews was conducted with the ComEd BILD Program Manager and one with the Applied Proactive Technologies (APT) Implementation Manager. These interviews were completed over the telephone in March and April of 2013. Both interviews focused on the large program changes that went into effect in EPY5 and the impact these changes had on program participation and impacts. The interview guides used are included in Appendix 7.7.2.

7.2.1.3 Program Distributor Interviews

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

A total of 10 participating distributors were interviewed, most of whom were able to provide data used to calculate a supplier self-reported NTGR estimate. These distributors collectively represented 30% of overall EPY5 bulb sales, with one distributer representing 15% of sales. Priority for inclusion in the distributor interviews was based upon both volume of program sales and type of distributor (Original Equipment Manufacturer, National Account Distributor, primary sales to contractor or C/I maintenance, repair, and operations).

7.2.1.4 Program End-user Telephone Survey

The evaluation team conducted a telephone survey with a random sample of end use customers who purchased lighting through the EPY5 BILD Program. These telephone surveys collected data to estimate the parameters necessary to calculate gross and net energy and demand impacts and assess process-related questions. This survey was fielded between July 18 and August 23, 2013. The original goal was to conduct a total of 400 end-user surveys. The evaluation team set this goal before we had complete program tracking information. As noted previously, the tracking data did not contain contact information for the program end-users and thus it was requested from program distributors, which yielded significantly fewer sample points than desired.[46] The final sample frame for our survey included 1,304 customers, and we completed 232 surveys.

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

Sampling

There were 3,205 unique end-users who purchased discounted bulbs through the BILD program in EPY5. Anticipating a 10% to 15% completion rate, the evaluation team would have ideally received contact information for all end-users to arrive at 400 completes. However, BILD program implementers indicated that requesting contact information for all end-users for all distributors would place an undue burden on the distributors. Accordingly, the evaluation team requested a subset of end-user contact information from each distributor based on the total number of end-users purchasing from that distributor. For distributors selling to fewer than 20 end-users, contact information was requested for all customers. For those selling to 21 to 50 end-users, 20 contacts were requested. Forty contacts were requested from distributors selling to 51 to 100 end-users, and 50 contacts were requested from distributors selling to more than 100 customers. The evaluation team provided a random selection of customer names and addresses to each distributor and requested contact names and phone numbers. Results of the contact request were varied. Some distributors were able to quickly and easily provide the requested information. Others provided a sample of contact information that was different that the business names and addresses provided to them. Still others provided a subset of the requested data or no response whatsoever.

In addition to the contacts requested by the evaluation team, a number of the distributors had provided contact information for a subset of consumers to APT for quality control review (or possibly to fulfill the program requirements). These contacts were also made available to the evaluation team. Finally, end-user contacts from EPY4 were cross referenced to end-users in the EPY5 tracking database, resulting in additional contacts.

[46] Providing end-user contact information to program implementers was a program requirement for the EPY5 BILD program, however this requirement was not enforced and so end-user telephone survey sample was again difficult in EPY5.

Overall, developing the end-user sample frame was a very labor intensive process. If customer phone number and contact name could be recorded for each transaction (customer name and address are already collected), future evaluation efforts would be streamlined considerably.

Survey Disposition

Table 7-2 shows the final disposition resulting from calling 1,304 ComEd commercial customers who purchased program discounted BILD program bulbs through a program distributor. We called each customer numerous times at different times of day and scheduled call backs with anyone who wanted to be called at a later time. In total, 232 surveys were completed in EPY5.

Table 7-2. End-user Survey Call Disposition

Call Disposition	End-user Survey	%
Sample Pulled	1,304	100%
Completed Surveys	232	18%
Refusal	424	33%
No answer/answering machine/busy/call back, unable to complete	444	34%
Disconnected/wrong number, blocked	175	13%
Not Eligible[47]	29	2%

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

7.2.1.5 PY5 Illinois Technical Reference Manual

PY5 is the first year that ComEd has had a TRM in place to guide the estimation of Verified Savings. The EPY5 IL TRM was a collaborative effort by members of the Illinois Energy Efficiency Stakeholder Advisory Group (SAG). As stated in the TRM, its purpose is "to provide a transparent and consistent basis for calculating energy (kilowatt-hours (kWh) or therms) and capacity (kilowatts (kW)) savings generated by the State of Illinois' energy efficiency programs.[48]" In some cases the Verified Savings impact parameters could be taken directly from the TRM; however in other cases it was necessary to estimate the Verified Savings impact parameters by applying findings from the EPY5 Evaluation Research analysis to the TRM values (for example, estimating HOU using the residential vs. non-residential split of EPY5 program bulbs).

7.2.2 Evaluation Research Findings Gross Impact Results

This section presents the Evaluation Research Findings Gross parameter estimates and Impact results. As described in Section 2, gross energy and demand savings are estimated using the following formula as specified in the TRM:

[47] 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.

[48] Footnote from TRM: http://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=1277&ChapterID=23

Research Findings Gross Annual kWh Savings = Program bulbs * Delta Watts/1000 * HOU * Energy IE* Realization Rate

Where:

- Delta Watts = Difference between Baseline Wattage (incandescent wattage) and CFL Wattage
- HOU = Annual Hours of Use
- Energy IE = Energy Interactive Effects
- Realization Rate = Installation Rate

Research Findings Gross Annual kW Savings = Program bulbs * Delta Watts/1000 * Realization Rate

Research Findings Gross Annual Peak kW Savings = Gross Annual kW Savings * Peak Load Coincidence Factor * Demand IE

Where:

- 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.
- Demand IE = Demand Interactive Effects

Table 7-3 below contains the Research Findings Gross Savings parameter estimates. Derivations of these Evaluation Research estimates are provided in Section 7.3 below. These estimates differ slightly from the Verified Savings estimates in the following places:

- Across all bulb types, the delta watts estimate for Verified Savings is approximately 6% higher than the Evaluation Research. While most bulb types show very close alignment across the three methods, the Evaluation based delta watts for specialty LEDs is over 30% lower than the Verified savings. Specifically, the Evaluation based lumen mapping establishes a consistently lower base wattage as compared to the Verified savings method for LED reflector lamps. A detailed explanation for this result can be found in Section 7.3.3 below.
- Evaluation Research estimated Installation rates were found to be 13% higher than the estimates 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 EPY5 end-user telephone surveys. The installation rates for HID lamps and LED fixtures were assumed to be the same as LED bulbs.[49]

[49] Due to the low number of HID bulbs and LED fixtures sold, it was not possible to conduct phone surveys with a reasonably large sample of end-users. While HID lamps and LED lamps are used for very different applications, they are both often used in niche applications where the installation rates may be similar. As HID lamps make up approximately 0.2% of program bulb sales, this assumption has little impact on the overall IR.

Table 7-3. Research Findings Gross Savings Parameters

Parameter	Stan. CFLs	Spec. CFLs	LED Bulbs	LED Fixtures	Linear FLs	HID	Total
Bulb Sales	249,799	347,639	202,433	9,522	503,627	2,799	1,315,819
Delta Watts	46.9	36.6	35.1	41.3	5.6	62.3	26.6
NonRes Installs	92%	92%	92%	99%	99%	99%	95%
HOU - Res / NonRes	2.74 / 9.09	2.74 / 9.09	2.74 / 9.09	2.74 / 12.49	2.74 / 12.49	2.74 / 12.49	2.74 / 10.48
Peak CF - Res / NonRes	0.09 / 0.67	0.09 / 0.67	0.09 / 0.67	0.09 / 0.66	0.09 / 0.66	0.09 / 0.66	0.09 / 0.66
Installation Rate	77%	77%	90%	90%	96%	90%	87%
Energy IE - Res / NonRes	1.05 / 1.25	1.05 / 1.25	1.05 / 1.25	1.05 / 1.23	1.05 / 1.23	1.05 / 1.23	1.05 / 1.25
Demand IE - Res / NonRes	1.11 / 1.43	1.11 / 1.43	1.11 / 1.43	1.11 / 1.38	1.11 / 1.38	1.11 / 1.38	1.11 / 1.42

Source: Evaluation Team analysis.

Table 7-4 below shows the Research Findings gross savings estimates by bulb type and overall, and presents the Research Findings gross realization rates associated with these impact estimates. As this table shows, the total EPY5 BILD Program Research Findings gross savings is estimated to be 116,935 MWh, 28.5 MW, and 25.3 Peak MW. The Research Findings gross realization rate for the EPY5 BILD Program is calculated as the ratio of the Research Findings gross savings over the Verified Savings gross savings. The overall Research Findings gross realization rate for EPY5 was estimated to be between 92 and 95% for energy, demand and peak demand savings. This discrepancy between the overall Verified Savings and the overall Research Findings savings estimate is primarily attributable to the difference in delta watts estimates for LED bulbs that were 26% lower using the Research Findings estimate than they were for the Verified Savings estimate. This difference was nearly entirely driven by LED reflectors which had a much lower lumen mapping in the Evaluation Research method.[50]

As the table below also shows, the gross realization rates vary by bulb type from a low of 65% for LED bulbs to a high of 137% for Linear FL bulbs. The low LED RR was explained above and the high Linear FL RR was primarily driven by the high installation rate estimated by the Evaluation Research method, 96%, compared to the Verified Savings IR estimate of 70%.

[50] Complete information on lumen mappings is included Section 7.3.3.

Table 7-4. EPY5 Research Findings Gross Impact Savings Estimates

	Gross Energy Savings (MWh)	Gross Demand Savings (MW)	Gross Peak Demand Savings (MW)
Bulb Type Research Findings Gross Savings			
Standard CFLs	35,403	9.1	8.0
Specialty CFLs	38,442	9.8	8.7
LED Bulbs	25,099	6.4	5.7
LED Fixtures	1,986	0.4	0.3
Linear FLs	15,126	2.7	2.4
HID	879	0.2	0.1
Total	116,935	28.5	25.3
Bulb Type Research Gross Findings Savings Realization Rate			
Standard CFLs	109%	111%	108%
Specialty CFLs	98%	100%	98%
LED Bulbs	65%	67%	65%
LED Fixtures	99%	100%	95%
Linear FLs	137%	138%	130%
HID	89%	90%	85%
Total	94%	95%	92%

Source: Evaluation Team analysis.

7.2.3 Research Findings Net Program Impact Results

In EPY5, both free-ridership and spillover were explored during the end-user telephone surveys (n=232) and the distributor interviews (n=10). The evaluation team calculated free-ridership and spillover estimate for CFLs, LEDs and Linear FL bulbs separately based on questions focused specifically on each one of these bulb types. The NTGR estimates resulting from the end-user self-report method and the distributor self-report method were very similar, by bulb type (CFL, LED and Linear Fluorescent) and overall. Due to the similarity in the results and the larger sample of data available for the end-user self-report method, the final evaluation research net parameters (shown in Table 7-5 below) were based on the end-user self-report results.

For this method, distinct customer-level free-ridership and spillover estimates were created for CFLs, LEDs and Linear Fluorescent bulbs,[51] and then each of these customer-level estimates was weighted

[51] Due to the small volume of HID and CCFL bulbs and LED fixtures (together they made up just 3% of the EPY5 program), distinct free-ridership and spillover estimates were not estimated for these bulb types. Instead, the

by the quantity of EPY5 bulbs purchased by that participant to come up with overall NTGR estimates for each bulb type. These estimates were then weighted by the proportion of the total EPY5 bulb sales each bulb type represented to come up with overall EPY5 free-ridership estimates.

Table 7-5. Research Findings Net Parameter Estimates

Research Findings Net Savings Parameter	Stan. CFL	Spec. CFL	LED Bulb	LED Fixtures	Linear FL	Total
NTGR	0.66		0.70		0.56	0.63
Upper 90% CI	0.69		0.75		0.60	0.67
Lower 90% CI	0.62		0.64		0.52	0.58

Source: Evaluation Team analysis

Using the Evaluation Research NTGR values, the evaluation calculated Research Findings net savings of 76,414 MWh, 18.8 MW, and 16.6 Peak MW as shown in Table 7-6 below. As this table shows, the overall Research Findings net savings estimate was roughly 83% of the Verified Savings estimate despite the fact that the Research Findings gross savings were 94% of the Verified Savings gross estimate. The reason for this 10% decline in the net realization rate between the Research Findings and the Verified Savings is because the Evaluation Research NTGR was 85% of the deemed Verified Savings NTGR (0.63 / 0.74 = 85%).

LED estimates were used as a proxy for LED fixtures and HID bulbs, and the CFL estimates were used as a proxy for the CCFL bulbs.

Table 7-6. EPY5 Research Findings Net Impact Savings Estimates

	Net Energy Savings (MWh)	Net Demand Savings (MW)	Net Peak Demand Savings (MW)
Bulb Type Research Findings Net Savings			
Standard CFLs	23,277	6.0	5.3
Specialty CFLs	25,275	6.5	5.7
LED Bulbs	17,448	4.5	4.0
LED Fixtures	1,380	0.2	0.2
Linear FL	8,422	1.5	1.4
HID	611	0.1	0.1
Total	76,414	18.8	16.6
Bulb Type Research Findings Net Savings Realization Rate			
Standard CFLs	97%	99%	96%
Specialty CFLs	87%	89%	87%
LED Bulbs	61%	63%	61%
LED Fixtures	93%	94%	89%
Linear FL	103%	104%	98%
HID	84%	85%	80%
Total	83%	84%	82%

Source: Evaluation Team analysis.

7.2.4 EPY6 Carryover Savings Estimate

Calculation of the EPY6 carryover estimate relies upon the IL TRM (v 1.0 and 2.0) and the EPY4 and EPY5 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 will be counted in EPY6. The energy and demand savings from these EPY4 and EPY5 late installed bulbs are calculated based on the following parameters:

- Delta Watts – Verified Savings estimate from the year of installation (source: IL TRM v2.0)
- Res/NonRes Split - Evaluation Research from the year of purchase (EPY4 and EPY5 Report, revised to include multi-family common areas as a NonRes area)
- HOU and Peak CF – Verified Savings estimate from the year of installation (source: IL TRM v2.0)
- Energy and Demand IE – Verified Savings estimate from the year of installation (source: IL TRM v2.0)
- Installation Rate - Verified Savings estimate from the year of purchase (source: EPY4 report and IL TRM v1.0)
- NTGR – Evaluation Research from the year of purchase (EPY4 and EPY5 Report)

Table 7-7 below shows that the gross savings from the 229,135 bulbs sold in EPY4 or EPY5 and installed in EPY6 is estimated to be 27,637 MWh and the net savings is estimated to be 17,297 MWh.

Table 7-7. EPY6 Carryover Savings Estimates

PY6 Verified Savings Carryover Estimate	PY4 Program Bulbs	PY5 Program Bulbs	Total PY6 Carryover
Program Bulbs Installed During PY6	78,344	150,792	229,135
Average Delta Watts	36.5	21.8	26.9
Average Daily Hours of Use	9.7	10.5	10.3
Peak Load Coincidence Factor	0.64	0.64	0.64
Gross kWh Impact per unit	129.3	84.1	100.6
Gross kW Impact per unit	0.04	0.02	0.03
Installation Rate	100%	100%	100%
Energy Interactive Effects	1.18	1.24	1.22
Demand Interactive Effects	1.33	1.40	1.38
PY6 Carryover Gross Energy Savings (MWh)	11,929	15,708	27,637
PY6 Carryover Gross Demand Savings (MW)	2.9	3.3	6.2
PY6 Carryover Gross Peak Demand Savings (MW)	2.4	2.9	5.4
Net-to-Gross Ratio	0.63	0.63	0.63
PY6 Carryover Net Energy Savings (MWh)	7,466	9,831	17,297
PY6 Carryover Net Demand Savings (MW)	1.8	2.1	3.9
PY6 Carryover Net Peak Demand Savings (MW)	1.5	1.8	3.4

Source: Evaluation Team analysis.

7.3 Evaluation Research Findings Gross and Net Savings Parameters

7.3.1 Program Bulb Sales and Distribution

The number of bulbs distributed through the program is a key parameter in the calculation of gross and net program impacts and is used to extrapolate the per-bulb savings estimates to the program level. Table 7-8 shows the spread of bulb sales across the six primary bulb types. Unsurprisingly, the addition of LED, linear fluorescent, HID, and CCFL bulb types in EPY5 dramatically changed the distribution of bulb sales. As this table shows, linear fluorescents accounted for 38% of the total sales, followed by specialty CFLs (24%), standard CFLs (19%), and LEDs (16%). In EPY4, specialty CFLs (including high wattage bulbs) accounted for 66% of bulb sales, and standard CFLs made up the remaining 34%. Because incentives vary widely between bulb types, incentive spending is not directly correlated to bulb type. With incentives of up to $13/bulb, LEDs accounted for nearly half of

total rebate dollars, followed by specialty CFLs (27%), and linear fluorescents (14%). Overall, total bulb sales in EPY5 increased 128%, and total rebates paid increased 75% over EPY4.

Table 7-8. Distribution of EPY5 Program Bulb Sold and Incentives Paid

Bulb Type	Bulb Sales		Incentives Paid	
Standard CFLs	249,799	19%	$257,179	7%
Specialty CFLs	318,504	24%	$999,054	27%
LEDs	211,955	16%	$1,743,300	47%
Linear FL	503,627	38%	$503,627	14%
HID	2,799	0%	$47,695	1%
CCFL	29,135	2%	$145,671	4%
Total	**1,315,819**	**100%**	**$3,696,526**	**100%**

Source: Navigant Evaluation Team Analysis of Program Tracking Data

Table 7-9 below provides the distribution of EPY5 program bulbs by bulb and specialty type. As indicated previously, linear fluorescent lamps were the largest contributor to program bulb sales (specifically T8s at over 36%). CFL A-lamps and LED reflector lamps also contributed significantly to overall program sales (16% and 11%, respectively).

Table 7-9. Distribution of EPY5 Program Bulbs by Specialty Bulb Type

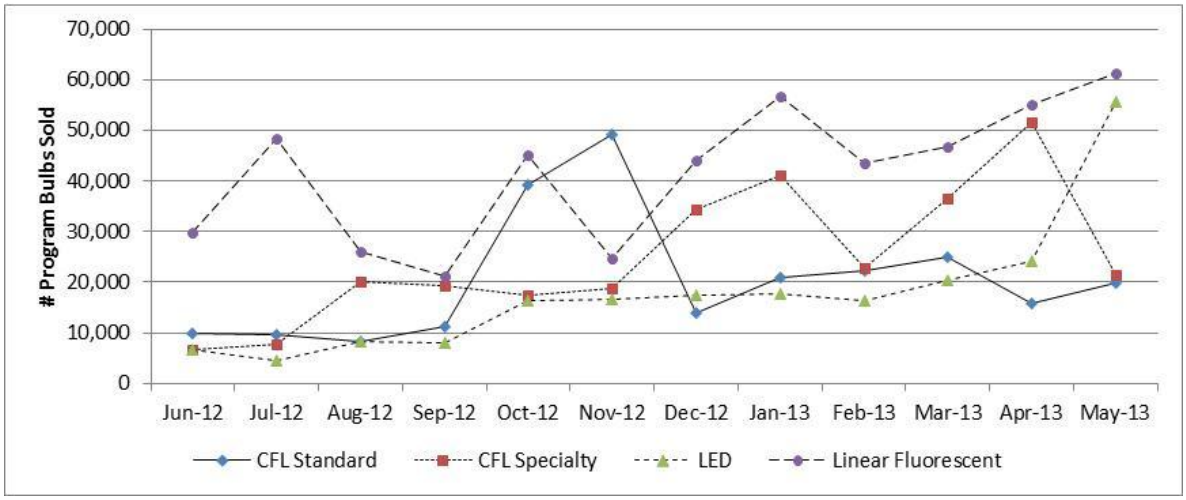
Bulb Type	Specialty Type	Bulbs Sold	% of Program Sales
Standard CFLs	Twist	249,799	19.0%
Specialty CFLs	3-Way	723	0.1%
	A-Lamp	211,493	16.1%
	Candelabra	9,725	0.7%
	Circline	64	0.0%
	Dimmable Twist	5,280	0.4%
	Globe	10,069	0.8%
	High Wattage	6,411	0.5%
	Post	300	0.0%
	Reflector	73,787	5.6%
	Tubular	408	0.0%
	Twist GU24	244	0.0%
LEDs	A-Lamp	57,945	4.4%
	Candelabra	6,999	0.5%
	Exit Sign	1,192	0.1%
	Globe	1,749	0.1%
	Reflector	144,070	10.9%
Linear FL	T5	29,094	2.2%
	T8	474,533	36.1%
HID	HID	2,799	0.2%
CCFL	A-Lamp	5,162	0.4%
	Candelabra	18,201	1.4%
	Dimmable Twist	2	0.0%
	Globe	1,653	0.1%
	Reflector	4,117	0.3%

Source: Business Instant Lighting Discounts Tracking Data

Figure 7-1 below presents the distribution of program bulbs sales by month and for the four predominant bulb types. There are no clear trends that stand out as common for all bulb types, though it does appear as if bulb sales for all bulb types gradually increased (on average) as the program year progressed. Indeed, the sales in the second half of the program year for specialty CFLs and LEDs were more than twice the sales in the first half, and linear fluorescent sales increased by

almost 60% in the second half of the program year[52]. For standard bulbs, monthly sales in the second half of the program year were nearly double monthly sales in the first half of the year (excluding the large spike in October and November). Linear fluorescent bulbs exhibited the most month to month variability in sales, perhaps due to a higher number of bulbs per transaction (average bulbs per transaction for linear fluorescents was three to six times higher than the other three bulb types).

Figure 7-1. Program Bulb Sales by Month and Bulb Type



Source: BILD Incentive Tracking Data

7.3.2 Installation Rate

The evaluation estimates of installation rate for CFLs, LEDs, and linear fluorescent lamps purchased as part of the EPY5 BILD program were calculated based on data gathered during the end-user telephone surveys. Two hundred and thirty-two surveys were completed across 14 business type classifications. 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). Nine of the 232 surveys were excluded from the sample due to no response or a

[52] The evaluation team looked at the correlation between this increase and the bonus program offered to top selling distributors in the end of EPY5 and in fact we found that sales from non-bonus program participants increased at a greater rate than those offered the bonus program. Further details provided in Section 7.4.7 below.

response of "Don't know" to the first question listed above. Table 7-10 below shows the installation rates based on the end-user surveys.

Table 7-10. End-user Survey Installation Rate

Population		Installation Rate	Lower 90%CI	Upper 90%CI	n Respondents	n Bulbs	N Bulbs
Overall Weighted[53]		87%	83%	91%	223	104,724	1,283,885
Bulb Type	CFL[54]	78%	70%	85%	93	46,720	568,303
	LED	91%	85%	96%	82	20,983	211,955
	Linear	96%	92%	100%	48	37,021	503,627
< 50	CFL	98%	93%	100%	28	602	116,760
	LED	99%	97%	100%	41	684	50,101
	Linear	96%	87%	100%	11	242	13,208
≥ 50	CFL	72%	63%	81%	65	46,118	451,543
	LED	90%	83%	98%	41	20,299	161,854
	Linear	96%	91%	100%	37	36,779	490,419

Source: EPY5 End-user Surveys

The survey results indicate an overall installation rate of 87%. When disaggregated by bulb type, linear fluorescents have the highest installation rate (96%), followed by LEDs (91%), and CFLs (78%). Respondents purchasing fewer than 50 CFL bulbs reported an average installation rate of 98%, whereas those purchasing 50 or more bulbs installed 72%, a statistically significant difference. Installation rates for respondents purchasing LEDs and linear fluorescents were not statistically different based on the quantity of bulbs purchased.

Due to their higher prices and more specific applications, LED bulbs are expected to have higher installation rates than CFL bulbs. Additionally, customers seem to be more pleased with the performance of LEDs than CFLs, which results in fewer removals. Of all CFL bulbs installed by survey respondents, approximately 2% were removed due to customer preference, whereas only 0.02% of installed LEDs were removed.

It is unsurprising that linear fluorescent lamps have the highest installation rate. First, there is no noticeable performance difference between a high efficiency and a standard efficiency linear

[53] 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.

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

fluorescent lamp, which results in a very low removal rate due to customer preference (zero installed LFs were removed by those interviewed). Additionally, commercial and industrial facilities often have large numbers of linear fluorescent lamps installed. These lamps are usually replaced either through attrition or a total re-lamping. In the case of the latter, a very large portion of the purchased bulbs would be installed during the re-lamp. In the case of the former, facility managers are often familiar with the approximate number of bulbs that burn out in a given year and purchase bulbs accordingly. Because end-user surveys were conducted after the end of the EPY5 program year, survey respondents would have had a chance to use the majority of the purchased stock.

7.3.3 Delta Watts

Displaced watts or "Delta watts" is calculated as the difference between the program bulb wattage and baseline incandescent equivalent wattage. Program bulb wattages as specified by the manufacturer were easily obtained from the BILD Lighting Lookup Table. Appropriate baseline wattages are more difficult to establish as this metric depends on various factors including bulb type / shape, directionality, and federal standards.[55] In EPY5, the Verified Savings delta watts estimates were based on the deemed base wattage estimates outlined in the EPY5 IL TRM and Evaluation Research delta watts were estimated by applying a lumen mapping based on the program bulb type, bulb shape, and directionality (omni-directional, globes, directional, decorative, etc.). This evaluation approach is technology neutral, meaning that lumen ranges for specific bulb types are consistent across technologies. This method is similar to the Evaluation Research method applied in EPY4 and is also the method currently included in Version 2.0 of the IL TRM (which is effective beginning in EPY6). Delta watts based on the manufacturer's incandescent equivalency claims are also included in this report.

Verified Savings

The IL TRM specifies unique baseline watts calculation methodologies for standard CFLs, specialty CFLs, CFL fixtures, and omni-directional, directional, and decorative LEDs. For standard CFLs and CFL fixtures, delta watts were calculated based on the lumen ranges specified in Table 7-11. For the EPY5 evaluation, bulbs with lumen output in the 1490 – 2600 range were subject to the new EISA standards and have reduced baseline wattage of 72 watts. All other standard and omni-directional CFLs and CCFLs were evaluated according to the "Pre-EISA" incandescent equivalent.

[55] The Energy Independence and Security Act 2007 (EISA) and the Energy Policy and Conservation Act of 2012 (EPACT).

Table 7-11. IL TRM Baseline Wattage Specifications for Standard CFLs and CCFLs

Minimum Lumens	Maximum Lumens	Incandescent Equivalent Pre-EISA 2007 (WattsBase)	Incandescent Equivalent Post-EISA 2007 (WattsBase)	Effective date for EISA 2007 implementation
2601	3300	150	150	N/A 2600+ lumen bulbs are exempt from EISA.
1490	2600	100	72	June 2012
1050	1489	75	53	June 2013
750	1049	60	43	June 2014
310	749	40	29	June 2014

Source: Illinois Statewide Technical Reference Manual – effective June 1st, 2012

Baseline wattages for specialty CFLs and CCFLs (including reflector lamps) were established based on the lumen ranges specified in Table 7-12.

Table 7-12. IL TRM Baseline Wattage Specifications for Specialty CFLs and CCFLs

Incandescent Bulbs (Watts)	Minimum Light Output (Lumens)	Common ENERGY STAR Qualified Bulbs (Watts)
25	250	4 to 9
40	450	9 to 13
60	800	13 to 15
75	1,110	18 to 25
100	1,600	23 to 30
125	2,000	22 to 40
150	2,600	40 to 45

Source: Illinois Statewide Technical Reference Manual – effective June 1st, 2012

Baseline wattages for omni-directional LEDs were established based Table 7-13 below.

Table 7-13. IL TRM Baseline Wattage Specifications for Omni-directional LEDs

Nominal wattage of lamp to be replaced (Wattsbase)	Minimum initial light output of LED lamp (lumens)	Post EISA 2012-2014 Incandescent wattage	Effective date for post EISA 2012-2014 assumption
25	200	25	Exempt
35	325	29	June 2014
40	450	29	June 2014
60	800	43	June 2014
75	1,100	53	June 2013
100	1,600	72	June 2012
125	2,000	72	June 2012
150	2,600	150	Exempt

Source: Illinois Statewide Technical Reference Manual – effective June 1st, 2012

Baseline wattages for decorative LEDs were established based on Table 7-14 below.

Table 7-14. IL TRM Baseline Wattage Specifications for Decorative LEDs

Nominal wattage of lamp to be replaced (Wattsbase)	Minimum initial light output of LED lamp (lumens)
10	70
15	90
25	150
40	300
60	500

Source: Illinois Statewide Technical Reference Manual – effective June 1st, 2012

Finally, baseline wattages for directional LEDs were established based on Table 7-15 below.

Table 7-15. IL TRM Baseline Wattage Specifications for Directional LEDs

Nominal wattage of lamp to be replaced (Wattsbase)	Minimum initial light output of LED lamp (lumens)	LED Wattage (WattsEE)
25	250	6.25
35	350	8.75
40	400	10.0
60	600	15.0
75	750	18.75
100	1,000	25.0
125	1,250	31.25
150	1,500	37.5

Source: Illinois Statewide Technical Reference Manual – effective June 1st, 2012

Research Findings Savings

The EPY5 IL TRM base watt methodology described above takes the right approach as it uses different methods for establishing base watts for different bulb types. Despite this, the evaluation team believes there is still room for improvement. Similar to the TRM, the evaluation team recommends establishing baseline wattage by using lumen mapping that is specific to bulb type, shape, and directionality (omni-directional, globes, directional, decorative, etc.). Additionally, the evaluation team recommends a technology neutral approach, meaning that lumen ranges for specific bulb types should be consistent across technologies (the current TRM, for instance, uses different lumen ranges for CFL reflector bulbs than for LED reflector bulbs and the same lumen ranges for CFL reflector bulbs and other specialty CFLs).

The proposed method was first used to calculate the Evaluation Research in EPY4 and it has been included in Version 2.0 of the IL TRM which becomes effective beginning in EPY6. The evaluation team believes the bulb type and lumen mapping employed for the Evaluation Research is the most robust means currently available to establish incandescent equivalent wattage for general service bulb types, especially specialty CFLs and LEDs, which made up 74% of BILD EPY5 sales. Because lumen output is a measure of the total light produced in all directions from a source, bulbs such as reflectors (and LEDs in general) that focus light in a single direction require a different lumen mapping than a standard CFL. It is important to note that while lumens are becoming a more universal metric for light output across bulb types, industry experts suggest that lumens alone are not adequate to fully characterize the performance of directional lamps.[56] The bulb type and lumen

[56] The Lighting Research Center notes that "Most lamp manufacturers do not publish lumen output ratings for MR16 lamps or other reflectorized lamps in their catalogs. Instead, they publish beam angle and [Center Beam Candle Power], which provide more accurate information about the performance characteristics of the lamp." Similarly, Sylvania reports that "Requests are often received for the lumen output values for aluminum reflector

mapping recommended for EPY5 is based on federal regulations for general service lamps and incandescent reflector lamps.[57] For bulb types that are exempt from federal regulations, the Energy Star DRAFT[58] specification for lamps was used for lumen guidance.[59] The lumen ranges and incandescent equivalencies for bulbs subject to EISA[60] are identical to the current specifications for standard CFLs presented in Table 7-11. Table 7-16 below shows the recommended lumen to incandescent equivalencies for directional and non-directional bulbs for EISA exempt bulb types.

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or AR-type lamps. Usually, this is a meaningless specification; candlepower is the appropriate value for a reflector lamp since they are used for accent and display lighting. "
http://www.lrc.rpi.edu/programs/nlpip/lightingAnswers/mr16/performance.asp
http://assets.sylvania.com/assets/documents/faq0007-0297.cb5b8f25-05ee-463d-8d0c-c60912a4adf7.pdf

[57] The Energy Independence and Security Act 2007 (EISA) and the Energy Policy and Conservation Act of 2012 (EPACT).

[58] The Draft specification for lamps was finalized on August 28, 2013. There have been minor changes to the specification from its draft form. The evaluation team is exploring how these updates may change the current evaluation research lumen mapping. Because the Energy Star specifications were only used to supplement the federal standards for exempt bulb types, the evaluation team expects impacts to be minimal.

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

[60] Twist, dimmable twist, globe (less than 5" in diameter and > 749 lumen), candle (shapes B, BA, CA > 749 lumens), candelabra base lamps (>1049 lumens), intermediate base lamps (>749 lumens).

Table 7-16. Evaluation Baseline Wattage Specifications EISA Exempt Bulbs

Bulb Type	Lower Lumen Range	Upper Lumen Range	WattsBase
Standard Spirals >= 2601 lumens	2601	2999	150
	3000	5279	200
	5280	6209	300
3-Way	250	449	25
	450	799	40
	800	1099	60
	1100	1599	75
	1600	1999	100
	2000	2549	125
	2550	2999	150
Globe (medium and intermediate bases less than 750 lumens)	90	179	10
	180	249	15
	250	349	25
	350	749	40
Decorative (Shapes B, BA, C, CA, DC, F, G, medium and intermediate bases less than 750 lumens)	70	89	10
	90	149	15
	150	299	25
	300	749	40
Globe (candelabra bases less than 1050 lumens)	90	179	10
	180	249	15
	250	349	25
	350	499	40
	500	1049	60
Decorative (Shapes B, BA, C, CA, DC, F, G, candelabra bases less than 1050 lumens)	70	89	10
	90	149	15
	150	299	25
	300	499	40
	500	1049	60
Reflector with medium screw bases w/ diameter <=2.25"	400	449	40
	450	499	45
	500	649	50
	650	1199	65
R, PAR, ER, BR, BPAR or similar bulb shapes with medium screw bases w/ diameter >2.5" (*see exceptions below)	640	739	40
	740	849	45
	850	1179	50
	1180	1419	65
	1420	1789	75

Bulb Type	Lower Lumen Range	Upper Lumen Range	WattsBase
	1790	2049	90
	2050	2579	100
	2580	3429	120
	3430	4270	150
R, PAR, ER, BR, BPAR or similar bulb shapes with medium screw bases w/ diameter > 2.26'' and ≤ 2.5" (*see exceptions below)	540	629	40
	630	719	45
	720	999	50
	1000	1199	65
	1200	1519	75
	1520	1729	90
	1730	2189	100
	2190	2899	120
	2900	3850	150
***ER30, BR30, BR40, or ER40**	400	449	40
	450	499	45
	500	649-1179**	50
***BR30, BR40, or ER40**	650	1419	65
***R20**	400	449	40
	450	719	45
***All reflector lamps below lumen ranges specified above**	200	299	20
	300	399-639**	30

Source: Evaluation Team Analysis

A third DW estimation method was also applied, which simply used the baseline and measure wattage from the BILD Lighting Lookup table (which were provided by the lighting manufactures) to establish delta watts (Manufacturer Base Watts).

Using the three baseline wattages methods established above, delta watts was calculated for each program bulb by subtracting the program bulb wattage from the baseline wattage. Average delta watts values by bulb type and the three DW estimation methods are presented in Table 7-17, below.

Table 7-17. Average Delta Watts by Bulb Type and DW Estimation Method

EPY5 Evaluation Estimated	Standard CFLs	Specialty CFLs	Standard LED	Specialty LED	LED Fixture	Linear FL	HID	All EPY5
Bulbs Sold	249,799	347,639	52,844	149,589	9,522	503,627	2,799	1,315,819
Average Pgm Bulb Wattage	17.3	15.2	9.3	12.3	10.5	27.7	290.0	20.4
Verified Savings DW (TRM Base Watt)	46.9	35.5	36.2	51.5	37.3	5.6	62.3	28.1
Eval Research DW (Eval Base Watt)	47.0	36.6	36.3	34.7	41.3	5.6	62.3	26.6
Mfg DW (Mfg Base Watt)	46.5	38.2	36.2	52.8	38.4	5.6	62.3	28.9

Source: Evaluation Team Analysis

Across all bulb types, the variation in delta watts resulting from the two primary methods (Verified Savings and Research Findings) is approximately 5.6%. As most bulb types show very close alignment across the three methods, it is clear that the discrepancy is driven primarily by differences in specialty LEDs, where the Evaluation Research based delta watts is over 30% lower than the Verified Savings. Specifically, the Evaluation Research based lumen mapping consistently underestimates base wattage as compared to the Verified Savings method for LED reflector lamps.

The EPY5 TRM (Verified Savings method) lumen mapping specifically for directional LEDs (Table 7-15), is the same as the current Energy Star specification for directional lamps that are exempt from federal regulations (minimum lumens = 10 x incandescent wattage equivalent).[61] The Evaluation method uses approximately the same Energy Star mapping for these exempt bulb types. However, the Verified method uses this same mapping for non-exempt directional LEDs (R20, R30, R40, and PAR lamps) as well. This results in the large discrepancy between the two methods. As an example, two reflector lamps with high sales volumes will be examined.

Model X is an 18.5 watt PAR38 LED lamp that produces 1,232 lumens, and model Y is a 14 watt PAR30 LED lamp rated at 820 lumens. Together, these lamps account for approximately seven percent of LED reflector sales. The Verified Savings base wattage for model X and model Y are 100 watts and 75 watts, respectively. The federal standard for PAR lamps greater than 2.5 inches in

[61] These lamp types include: 65 watt BR30, BR40, and ER40 lamps, BR30, ER30, BR40, and ER40 lamps <= 50 watts, R20 lamps <= 45 watts, lamps <= 40 watts, and lamps smaller than 2.25" diameter.

diameter requires that the lamp must produce $5.9*P^{0.27}$ lumens per watt, where P is the rated incandescent lamp wattage. So, a 100 watt incandescent reflector lamp would have to produce 20.5 lumens per watt ($5.9*100^{0.27}$) or 2,046 lumens, and a 75 watt lamp would have to produce 1,420 lumens to comply with the federal standard. Clearly, model X and model Y fall well short of the lumen output required of a "comparable" incandescent. The Evaluation Research method based on the federal standard establishes a base wattage of 65 watts for model X and 45 watts for model Y. The difference in base wattages between the two methods is large for these non-exempt bulb types, which make up over 60% of LED reflector sales.

Because the Evaluation Research method is based on the Federal standard for reflector lamps and the fact that any bulb replacing an incandescent bulb should have comparable light output, the evaluation team believes this method is a more robust means of establishing baseline wattages for these specialty lamps. Interestingly, the manufacturer base watt delta watts results align very closely with the Verified delta watts method, which suggests that manufacturers are not specifying the "incandescent equivalent" wattages for LED reflectors based on the federal standard.

7.3.4 Hours of Use and Peak Coincidence Factor

Similar to the Verified Savings HOU and Peak CF estimates, the EPY5 Research Findings estimates are based on both the commercial and residential sections of v1.0 of the IL TRM. The average overall Evaluation Research HOU estimate from this study was 10.1 hours per day and the average overall Peak CF estimate from this study was 0.63.

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

Table 7-18 below shows the distribution of EPY5 BILD commercial and residential business types and the estimated daily HOU and Peak CF of these locations based on Version 1.0 of the IL TRM. This table also presents the overall bulb weighted average daily HOU and Peak CF, as well as the estimates across all residential and commercial locations.

Table 7-18. End-user Business Type Distribution and Associated HOU and Peak CFs

Business Type	PY5 Bulb Sales	PY5 Fixture Sales	Total	Daily HOU	Peak CF
Office	193,593	196,624	390,217	10.3	0.66
Elementary School	3,273	0	3,273	5.8	0.22
High School/Middle School	4,759	328	5,087	6.7	0.22
College/University	8,781	19,142	27,923	8.9	0.56
Retail/Service	93,071	172,673	265,744	11.2	0.83
Restaurant	45,939	594	46,533	13.1	0.80
Medical/Hospital	9,917	3,920	13,837	12.9	0.75
Grocery	3,124	4,008	7,132	13.3	0.69
Industrial	16,781	18,498	35,279	10.9	0.91
Garage	133	800	933	9.7	1.00
Warehouse	239	3,026	3,265	12.9	0.70
Miscellaneous NonRes	193,805	78,108	271,913	9.8	0.66
Hotel/Motel - in-unit	58,260	3,898	62,158	2.1	0.21
Hotel/Motel - common space	50,896	3,406	54,302	12.6	0.21
Hotel/Motel - exterior	4,500	301	4,802	13.4	0.00
Apt/Condos - common space	50,513	4,757	55,269	16.3	0.75
Apt/Condos - exterior	4,467	421	4,887	5.0	0.00
Apt/Condos - in-unit	57,821	5,445	63,266	2.6	0.10
Residential Average	**62,287**	**5,865**	**68,153**	2.7	**0.09**
NonResidential Average	**737,584**	**510,083**	**1,247,666**	10.5	**0.66**
Overall Average	**799,871**	**515,948**	**1,315,819**	**10.1**	**0.63**

Source: BILD End-user Surveys and TRM v1.0

7.3.5 Interactive Effects

Similar to the HOU and Peak CF reported above, energy and demand interactive effects vary significantly by end-user business type and thus the evaluation team believes are best assigned based on the distribution of the participating end-users. Version 1.0 of the TRM includes estimates of both energy and demand interactive effects by business type. The commercial building type-specific interactive effects estimates from the TRM were applied to the distribution of specific commercial building types into which program bulbs were being installed. For bulbs installed within the individual units of apartment buildings/condominiums, the energy and demand interactive effects factors included in the Residential section of the IL TRM v1.0 were applied. Table 7-19 below shows the distribution of EPY5 BILD commercial and residential business types and the estimated energy

and demand interactive effects (Waste Heat Factor Energy (WHFe) and Waste Heat Factor Demand (WHFd)) associated with each of these business types.

Table 7-19. End-User Business Type Distribution and Associated Interactive Effects

Business Type	PY5 Bulb Sales	PY5 Fixture Sales	Total	WHFe	WHFd
Office	193,593	196,624	390,217	1.25	1.30
Elementary School	3,273	0	3,273	1.21	1.33
High School/Middle School	4,759	328	5,087	1.23	0.74
College/University	8,781	19,142	27,923	1.14	1.50
Retail/Service	93,071	172,673	265,744	1.24	1.44
Restaurant	45,939	594	46,533	1.34	1.65
Medical/Hospital	9,917	3,920	13,837	1.35	1.69
Grocery	3,124	4,008	7,132	1.43	1.52
Industrial	16,781	18,498	35,279	1.03	1.06
Garage	133	800	933	1.00	1.00
Warehouse	239	3,026	3,265	1.16	1.17
Miscellaneous NonRes	193,805	78,108	271,913	1.24	1.46
Hotel/Motel - in-unit	58,260	3,898	62,158	1.15	1.51
Hotel/Motel - common space	50,896	3,406	54,302	1.15	1.51
Hotel/Motel - exterior	4,500	301	4,802	1.00	1.00
Apt/Condos - common space	50,513	4,757	55,269	1.34	1.57
Apt/Condos - exterior	4,467	421	4,887	1.00	1.00
Apt/Condos - in-unit	57,821	5,445	63,266	1.06	1.11
Residential Average	**62,287**	**5,865**	**68,153**	**1.05**	**1.11**
NonResidential Average	**737,584**	**510,083**	**1,247,666**	**1.25**	**1.42**
Overall Average	**799,871**	**515,948**	**1,315,819**	**1.24**	**1.42**

Source: BILD End-user Surveys and TRM v1.0

7.3.6 Leakage

Based on the end-user telephone interviews conducted for the EPY5 evaluation, leakage of program bulbs outside of ComEd territory appears to be a very small issue for the BILD program. Of the 232 respondents, only five 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 less than 0.4% of the total bulbs purchased by survey respondents. This result is very similar to the low rate found during the EPY4 evaluation (0.2%).

7.3.7 Carryover Savings

In EPY5, the BILD program also generated energy and demand savings resulting from bulbs purchased during EPY4[62], but not believed to be installed (i.e., used by the consumer) in the program year during which they were purchased. Similarly, saving from program bulbs purchased in PY5, but not installed in PY5, will be counted in the subsequent two program years.

Calculation of the EPY5 Verified Savings carryover estimate relies upon the IL TRM (v 1.0) and the EPY4 report. The energy and demand savings from EPY4 bulbs installed in EPY5 are calculated based on the following parameters:

- Delta Watts – Verified Savings estimate from the year of installation (source: IL TRM v1.0)
- Res/NonRes Split - Research Findings from the year of purchase (EPY4 Report, updated to classify multi-family common areas as NonRes)
- HOU and Peak CF – Verified Savings estimate from the year of installation (source: IL TRM v1.0)
- Energy and Demand IE – Verified Savings estimate from the year of installation (source: IL TRM v1.0)
- Installation Rate - Verified Savings estimate from the year of purchase (source: EPY4 report)
- NTGR –Research Findings from the year of purchase (EPY4 Report)

Table 7-20 below shows that the gross savings from the 78,344 bulbs sold in EPY4 and installed in EPY5 is estimated to be 12,850 MWh and the net savings is estimated to be 8,043 MWh.

[62] Typically carryover savings are considered from the previous two program years (EPY3 and EPY4), however the BILD program (formerly called the MidStream Incentive Program) was a pilot in EPY3 and all bulbs were assumed to be installed in the year of sale and so no bulbs remained for carryover into future program years.

Table 7-20. EPY5 Savings Estimate for Carryover Bulbs

EPY5 Carryover Parameters	Estimate
Program Bulbs Sold in EPY4	575,252
Program Bulbs Installed in EPY4	417,630
Program Bulbs Installed During EPY5	78,344
Average Delta Watts	39.4
Average Daily Hours of Use	9.69
Peak Load Coincidence Factor	0.64
Installation Rate	100%
Energy Interactive Effects	1.18
Demand Interactive Effects	1.33
EPY5 Carryover Gross Energy Savings (MWh)	12,850
EPY5 Carryover Gross Demand Savings (MW)	3.1
EPY5 Carryover Gross Peak Demand Savings (MW)	2.6
Net-to-Gross Ratio	0.63
EPY5 Carryover Net Energy Savings (MWh)	8,043
EPY5 Carryover Net Demand Savings (MW)	1.9
EPY5 Carryover Net Peak Demand Savings (MW)	1.6

Source: Evaluation Team Analysis

7.3.8 Net-to-Gross Ratio

As mentioned above, after gross program impacts have been estimated, net program impacts are calculated by multiplying the gross impact estimate by the program realization rate and net-to-gross ratio (NTGR). In EPY5, two primary methods were used to estimate the NTGR:

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

7.3.8.1 Customer Self-Report Method

As shown in Table 7-21, the overall end-user self-reported NTGR estimate across all EPY5 bulb types was estimated to be 0.63. The table below also provides NTGR estimates by bulb type and shows how LEDs had the highest NTGR estimate and Linear FL had the lowest NTGR estimate. The Linear FL results were statistically significantly lower than the CFL and LED results, but the LED and CFL results were not statistically different from one another. As this table also shows, spillover seemed to vary across bulb types with LED purchasers having the highest rate of spillover and Linear FL purchasers having the lowest level.

Table 7-21. End-User Customer Self-Reported NTGR

Population		n	Program Bulb Sales	NTGR w/o spillover	Spillover	NTGR w/ spillover	Lower 90% CI	Upper 90% CI
Overall Weighted		222	1,315,819	0.57	0.05	0.63	0.58	0.67
Bulb Type	CFLs	91	568,303	0.59	0.07	0.66	0.62	0.69
	LEDs	80	202,433	0.62	0.08	0.70	0.64	0.75
	Linear FL	51	503,627	0.53	0.03	0.56	0.52	0.60
	Other	n/a	41,456	0.60	0.07	0.67	n/a	n/a

Source: Evaluation Team Analysis of End-user Survey Data

The overall NTGR is calculated as the average of three component scores. The first of these component scores reflects the respondents' rating of the overall importance of the BILD Program in their decision to purchase the screw-in CFLs from the distributor on a zero to 10 scale. The second component is derived from the self-reported likelihood that they would have purchased the same bulbs in the absence of the program, also on a zero to 10 scale. The third component is based on a ratio of how the respondent rated the importance of several specific program factors to how they rated the importance of several specific non program factors. Naturally, in calculating this third component score, higher scores for the importance of program factors drive the NTGR up, and higher scores for the importance of the non-program factors drive the NTGR down.

Table 7-22 below shows the average bulb-weighted component scores for each of the bulb types. As this table shows, the first component score (representing the average importance ranking on a 0-10 scale) was very similar across the three bulb types (8.1, 8.1 and 8.2). However, when adjusted for whether the organization decided to purchase high efficiency bulbs before or after they became aware of the ComEd discount, the average score across LED bulbs diverged from the CFL and Linear FL average scores. As the table below shows, LED purchasers were more likely to state that they decided to purchase the efficient bulb after they learned of the BILD program.

For the second scoring component, purchasers of all bulb types indicated a fairly low likelihood that they would have bought the same bulbs in the absence of the program, with weighted average scores ranging from a high of 4.3 for Linear FL to a low of 3.5 for CFLs.[63] For the third component, respondents generally gave equal ratings to the importance of specific program and non-program scores, which resulted weighted average scores very close to 5 for all bulb types. Among specific program factors within this third component, again in EPY5 the highest average program influences were given to the availability of the incentive and the distributor recommendation. As one might expect, LEDs purchasers ranked the incentive the highest (since LEDs are the most expensive bulb type and the rebates for LEDs are higher than the rebates for CFLs or Linear FL). Distributor

[63] In the overall NTGR calculation, these scores are converted to their converse [10 – 4.3 = 5.7] to express the answer in terms likelihood that the respondents would *not* have purchased the same bulbs in the absence of the program.

influence was ranked highest for LED and Linear FL purchasers which may results from distributors pushing these two technologies, which were only added to the program in EPY5, more so than CFLs.

The average of the three component scores yields overall NTGR ranging from 0.53 to 0.62. Ultimately, the three component scores fell into a fairly narrow range of 0.50-0.74 and provided a consistent message about the influence of the program on participants' purchasing behavior.

Table 7-22. Bulb-Weighted Average NTGR and Component Scores by Bulb Type

NTGR Components	Bulb Type		
	CFL	LED	Linear FL
Score1: Importance of Program (0-10 scale)	**8.1**	**8.1**	**8.2**
Before/After Adjusted Importance of Program64	5.9	7.4	5.2
% decided to purchase EE bulbs after learning of BILD	33%	53%	33%
Score2: Likelihood of Purchase without Program (0-10 scale)	**3.5**	**4.1**	**4.3**
Inverse likelihood of purchase score65	6.5	5.9	5.7
Score3: Influence Factor Ratio	**5.1**	**5.3**	**5.0**
*Program Influences (0-10 scale)	8.9	9.0	9.4
Availability of program rebate	7.6	8.3	8.1
Vendor Program Influence	7.6	8.2	8.2
Previous experience with program	6.2	4.1	8.2
Info from ComEd or Program materials	4.3	3.3	5.8
*Non-Program Influences (0-10 scale)	8.7	8.1	9.4
Previous experience with measure	7.3	6.4	8.4
Standard practice in industry	7.8	7.3	7.1
Corporate policy or guidelines	7.1	6.6	7.4
Final NTGR without Spillover	**0.59**	**0.62**	**0.53**

Source: Evaluation Team Analysis of End-user Survey Data

7.3.8.2 Supplier Self-Report Method

The overall net-to-gross estimate from the BILD distributor interviews was estimated to be 0.65 which is very consistent with the results from the customer self-report method. The distributor based NTGR estimates are based upon interviews with 10 distributors who make up roughly 30% of overall

[64] This adjusted importance component score was used for the calculation of NTGR.
[65] This inverse likelihood of purchase score (10-score) was used for the calculation of NTGR.

program bulb sales. The NTGR estimates calculated for each of the individual distributors ranged from zero to 1.

Table 7-23 below shows the distribution of responses distributors gave to the question regarding how many of the efficient program bulbs they sold that they estimate they would have sold in the absence of the BILD incentives and promotional materials. As the table shows, the percentage of distributors that indicated they would have sold all of the program bulbs they did in absence of the program ranged from a high 20% for LEDs to a low of 0% for Linear FL sales. None of the distributors stated they would have sold none of the program bulbs in the absence of the program. To calculate the level of free ridership by bulb type, distributors estimates of the percentage of bulbs sold in the absence of the program were weighted by the overall quantity of bulbs sold and averaged across all distributors' responses. NTGR was then set equal to one minus the free ridership level.[66] It ranged from a high of 0.91 for Specialty CFLs to a low of 0.51 for Standard CFLs.[67]

Table 7-23. Supplier Self-Report NTGR by Bulb Type

Supplier Self-Report NTGR	Bulb Type			
	Standard CFL	Specialty CFL	LED	Linear FL
N	6	7	10	5
Without BILD Distributor would have sold….				
All	17%	14%	20%	0%
Some	83%	86%	80%	100%
None	0%	0%	0%	0%
Bulb-Weighted Free ridership	49%	9%	20%	45%
NTGR Estimate	0.51	0.91	0.80	0.55

Source: Evaluation Team Analysis of Distributor Interview Data

7.3.8.3 Comparison of Net Impact Results across Methods

Table 7-24 presents estimated NTGR resulting from the two NTGR methods employed during the EPY5 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 SR algorithm that considers numerous aspects of free ridership and the generalized estimates provided by the distributors the evaluation team recommends using the customer Self-Report results to calculate the EPY5 Research Findings.

[66] No spillover was detected based on the distributor interviews.
[67] An overall NTGR of 0.68 was estimate for CFLs by bulb weighting the standard and specialty CFL results.

Table 7-24. NTGR Estimates by Evaluation Method

Evaluation Method	Data Source	CFL	LED	Linear FL	Overall
Customer Self-Report	End-user Telephone Surveys	0.66	0.70	0.56	0.63
Supplier Self-Report	Distributor In-depth Interviews	0.68	0.80	0.55	0.65
Recommended EPY5 NTGR Estimate		**0.66**	**0.70**	**0.56**	**0.63**

Source: Evaluation analysis

The evaluation found nearly 50% of the end-users purchasing program Linear FL bulbs were freeriders (leading to a NTG of 0.56 for Linear FL bulbs). These NTGR results for Linear FL bulbs are not unexpected as they are similar to result found in prior evaluation years in ComEd service territory and elsewhere in the U.S. They also align with currently ongoing market share tracking research which is finding high levels of high efficiency Linear FL bulb sales outside utility program. High efficiency T8s have been the target of Market transformation for over 20 years across the country. They are a massive commodity and prices are currently extremely competitive with standard efficiency T8s (approximately $1 incremental cost per bulb) which leads to short (< 1 year) payback periods. Improving the NTGR for these measures in an upstream program such as BILD is extremely difficult. Increasing it would likely mean a program redesign (i.e. a targeted downstream effort) or focusing the program on other less prevalent Linear FL measures (such as high efficiency T5's for appropriate uses). If the measure does not meet program cost effectiveness requirements with lower NTGR estimates, ComEd should consider focusing the BILD program more on emerging LED technologies which have higher NTGR estimates, and move the Linear FL program away from an incentive program to more of an educational program focused on the energy and monetary savings (and low payback period on investment) resulting from high efficiency T8 purchases in the absence of incentives. This also has the advantage of moving the program focus – appropriately – toward support of a newly emerging technology rather than on a technology that has been in the market for 5-10 years and is already well-established.

7.4 Detailed Process Results

The process evaluation of the EPY5 BILD program Evaluation assessed the program processes impacting distributors and end use customers who participated in the program. On the distributor side, we explored sales methods and target markets, program marketing and perceived customer awareness of the program, satisfaction with the program, challenges and barriers to participation, federal regulatory changes and distributor recommendations for program improvement. For end-users, we examined the reach of program marketing, types of participating end-users, usage of and purchasing decisions for CFLs, LEDs and High Efficiency Linear Fluorescent bulbs, federal regulatory changes, program discounts, and satisfaction and barriers to purchasing program bulb types. Data sources for the process evaluation include the distributor surveys (n=10) and the end-user telephone survey (n=232).

7.4.1 Distributor Program Participation and Sales

The BILD Program changed its product mix in EPY5 and significantly grew the program both in terms of the number of bulbs sold and the number of participating distributors. The program only discounted CFLs in EPY4. In EPY5, the program added reduced wattage linear fluorescent bulbs,

LEDs, and reduced wattage metal halide bulbs. As shown in Table 7-25, the new bulb types were quite popular and made up just over half of program sales (54% for LEDs, linear fluorescent and metal halides combined, though metal halides were less than 1% of total sales).

Table 7-25. Program Sales by Bulb Type

Bulb Type	EPY4	EPY5
CFL - Standard	34%	19%
CFL – Specialty	65%	26%
LED	n/a	16%
Linear Fluorescent	n/a	38%
Metal Halide	n/a	< 1%
Total	100%	100%

Source: Evaluation analysis of BILD Tracking Data

Compared to EPY4, four times the number of distributors sold bulbs through the BILD program in EPY5. The EPY5 distributors also had twice the number of unique store locations compared to EPY4 (see Table 7-26). All but three of the EPY4 distributors continued to participate in EPY5. The program chose to not include these three distributors in EPY5 because they were not meeting program standards and adhering to program requirements.

Table 7-26. Number of Participating Distributors by Program Year

Participants	EPY4	EPY5
Distributors	18	84
Locations	75	166

With a wider variety of products and more participating distributors, sales increased dramatically in EPY5. As noted in Section 3.2 program sales increased 129% from EPY4 to EPY5.

As a midstream program, distributors are critical to the success of the program. Our in-depth interviews with distributors suggest that the addition of LEDs and linear fluorescents made the program more attractive to them. The interviews reveal that LEDs, in particular, were an important offering for EPY5 and may be even more important in the future. All ten distributors interviewed sold LEDs through the BILD program; six of the ten said that the inclusion of LEDs was a very important reason why they participated and one more said LEDs were a somewhat important reason. These distributors noted the growing popularity of the product among their customers. One distributor said he participated because LED rebates were no longer available through the prescriptive program and wanted to continue to offer the rebates to his customers.

The inclusion of linear fluorescent bulbs was slightly less important to the five of the interviewed-distributors who sold the bulbs; one of five said the inclusion of linear fluorescents was very important to their participation while another said it was somewhat important. One of these

distributors who participated in EPY5 due to the inclusion of linear fluorescents noted that LEDs will be more relevant to his customers in the future.

Two distributors who said that the inclusion of LEDs and linear fluorescent bulbs was "not at all" important in their decision to participate in the BILD program went on to say that "the additional categories made the program infinitely more effective in terms of impact it had on the market" and "it was definitely a big driver of our sales."

Increasing sales was a key reason for participation for many distributors. Six of the ten interviewed said that the primary reason they got involved with the program was to grow their sales and to pass the savings along to their customers, and overall, the distributors we interviewed were satisfied with the sales the program generated. The average rating using a scale that ranged from zero ("very dissatisfied") to ten ("very satisfied") was 7.3. In addition, eight out of ten distributors said the sales either met or exceeded their expectations. The two distributors who said their expectations were not met were the only ones that were dissatisfied with their program sales. These distributors saw value in the rebates but had internal challenges incorporating the program into their sales process. One distributor said:

> *"We know there is opportunity out there; we just haven't yet cracked the code on how to offer this most effectively to our customers"*

Another commented:

> *"We sold a lot of products that qualify but we were having difficulty getting everything together, getting our different branches and sales people on board to follow the process, to receive the incentive"*

Our evaluation results are somewhat mixed as to whether the BILD program helped distributors expand their client base or whether it just increased their sales of energy efficient products to existing customers. Only three of the ten distributors interviewed said that the program helped them gain new customers. Our end-user survey asked a slightly different question on this subject. We asked end-users whether, prior to June 1, 2012 (the beginning of EPY5), they had purchased specific bulb types from the distributor who sold them the discounted bulbs. We referenced the actual types of bulbs the end-user purchased. We found that across bulb types, fewer than half had purchased that particular type of bulb from their distributor before EPY5 (see Table 7-27). This question does not tell us whether the end-user was an existing customer of the distributor. It is possible that end-users had purchased other bulb types from the distributor but had not purchased the type that they purchased through the program. Regardless, both the distributor interviews and end-user survey provide evidence that the BILD program has increased sales for distributors of program-supported products, which is the goal of the program.

Table 7-27. Prior End-User Purchases

Prior to June 1, 2012 had you ever purchased (bulb type) from distributor?	n	No
CFLs	148	36%
Linear Fluorescent	61	29%
LEDs	129	48%

Source: PY5 BILD End-User Customer Survey

Overall, the distributors we interviewed were satisfied with the program and its various elements. We asked distributors to rate different aspects of the program using a scale that ranges from zero ("very dissatisfied") to ten ("very satisfied") (see Table 7-28). Distributors reported high satisfaction with the program overall (9 of 10 satisfied). Satisfaction is highest with incentives offered for program bulbs (9 of 10 satisfied). Satisfaction is also high for program managers and other BILD staff, and incentive processing, and the program's impact on sales (7 of 10 satisfied). The requirements for reporting sales in order to receive reimbursements and the enrollment process had more moderate levels of satisfaction.

Table 7-28. Satisfaction with Program Elements

Program Element	n	Satisfied (7-10)	Moderately Satisfied (4-6)	Dissatisfied (0-3)	Mean (scale 0-10)
The program in general	10	9	0	1	8.3
Incentives offered for program bulbs	10	9	1	0	8.8
Program managers and other staff involved in the BILD program	10	7	3	0	8.1
Incentive processing	10	7	3	0	7.9
Sales that the program incentives have generated for your organization	10	7	1	2	7.3
Requirements for reporting sales in order to receive reimbursements	9	6	2	1	7.7
Enrollment process	9	5	3	1	7.4

Source: PY5 BILD Distributor Interviews
Distributors responded "don't know" to items with less than 10 distributors reporting

Despite the growth of the program and overall high levels of satisfaction, some barriers to distributor participation remain and are the items with more moderate satisfaction in Table 7-28. These barriers existed in EPY4, and though most distributors that we interviewed report these barriers have lessened, some still report challenges. One barrier to participation is knowing exactly what products qualify for program discounts. Though the program allows a wide variety of CFLs and LEDs, not all products on the market meet the lamp performance criteria required by the program. Three

distributors recommended that the program provide a database of all qualified products that it updates throughout the year.

The program reporting requirements are a barrier for distributors whose internal processes are not set up to track and easily provide the necessary information. Three of the ten distributors interviewed said they faced this challenge. One passed on the incentives to customers but gave up on requesting reimbursement due to the paperwork and then limited their future participation.

7.4.2 Program Reach

The program has the greatest reach into office locations. Across all three bulb types, offices are the most common installation location accounting for between 22 percent and 29 percent of the installations (see Table 7-29). However, the addition of LEDs and linear fluorescent bulbs likely expanded the program's reach to customers who may not have been interested in purchasing CFLs. Our end-user survey results show that apartments and hotels are other top installation locations for CFLs, while retail and service locations are a top location for LEDs. Linear fluorescents are being installed in hotels along with CFLs, but they are also being installed in industrial locations.

Table 7-29. Installation Location of Bulbs

Installation Location	All End Users	CFL Purchasers	LED Purchasers	Linear FL Purchasers
Office Buildings	24%	25%	22%	29%
Apartments/Condos	12%	20%*	7%	8%
Retail/Service	10%	2%	16%*	6%
Hotel/Motel	9%	15%*	6%	12%
Restaurant	6%	6%	7%	-
Industrial	5%	3%	5%	10%
Residential	4%	3%	5%	-
Recreation/Art/Entertainment	4%	4%	5%	4%
Warehouse	4%	2%	5%	8%
Real estate/property management	3%	5%	4%	4%
Church/public/other non-profit	3%	3%	3%	-
Medical/Hospital	3%	2%	3%	4%
College/University	3%	3%	4%	4%
Other	6%	7%	6%	12%
Don't know	2%	2%	2%	2%
n	232	123	111	52

Source: PY5 BILD End-User Customer Survey
Percentages do not sum to 100% to due to rounding. Asterisk represents a significant difference.

Across the three bulb types, most customers were either very or somewhat familiar with the bulbs prior to purchasing them (see Table-7-30). Familiarity with LEDs lags somewhat behind CFLs and familiarity with linear fluorescents lags a bit behind CFLs and LEDs.

Table-7-30. End-User Familiarity with Bulbs Prior to Purchase

Familiarity	CFLs	LEDs	Linear Fluorescents
Very familiar	61%	49%	47%
Somewhat familiar	24%	39%*	35%
Not too familiar	7%	7%	16%**
Not at all familiar	8%	5%	2%
n	96	82	51

Source: EPY5 BILD End-User Customer Survey
Percentages do not sum to 100% to due to rounding.
** Significantly higher than CFLs (95%). ** Significantly higher than CFLs and LEDs (90%).*

A majority of the customers who purchased discounted CFLs and LEDs through the program replaced less efficient bulbs (see Table-7-31). Incandescents were the most frequent type of bulb replaced for both CFLs and LEDs (55% CFLs and 52% LEDs). Customers installing LEDs are also replacing halogens (16% of customers), which is likely due to the frequent use of halogens in recessed sockets. CFLs are starting to replace CFLs as well. Fifteen percent of customers reported that the CFLs they purchased would replace all or mostly CFLs. Because some users still do not like the light qualify of CFLs, we might expect that more LEDs would replace CFLs but that is not the case yet as just 8% of LED customers reported that these bulb would replace all or mostly CFLs.

Table-7-31. Bulbs that Energy Efficient Bulbs Replaced

Types	CFLs	LEDs
All incandescents	45%	37%
Mixture of bulbs	15%	10%
Mostly incandescents	10%	15%
All CFLs	8%	7%
Mostly CFLs	7%	1%
Half incandescent and half CFLs	3%	1%
Halogens	3%	16%
Other	2%	10%
Don't Know	8%	1%

Source: EPY5 BILD End-User Customer Survey

7.4.3 Program Marketing

The BILD program uses discounts and information about the benefits of energy efficient lighting to encourage commercial customers to purchase energy efficient bulbs instead of less efficient alternatives. Distributors play a key role by making their customers aware of energy efficient lighting options, the benefits of these products, and the program discounts that are available. The program provides training and marketing materials to help distributors with their customer interactions. In EPY5, the program provided lighting guides for both commercial and industrial customers to help them with product selection as well as point of sale signage for their stores. Program representatives provide distributor training on an individual basis.

Our distributor interviews and end-user survey provide mixed results on the use of program marketing materials. Seven of the ten distributors we interviewed said they used the marketing materials provided by the program. These distributors reported distributing pamphlets and flyers to their customers either through their sales team, on display in the store, or sent via fax or email to customers. One distributor mentioned working with ComEd to craft email messages to promote the BILD program. End-users who purchased bulbs through the BILD program were less likely to report seeing the ComEd marketing materials. Fifty-seven percent saw the materials, and of these, 19% were exposed through their distributor (see Table 7-32). It is possible that the "emails" and "brochures" mentioned were from or seen at distributors so it is difficult to know exactly the degree to which distributors promoted the materials.

Table 7-32. Source of Marketing Materials

First Saw Marketing Materials	% of End-Users
Distributor	19%
Email	17%
Bill Inserts	12%
Non-Specific Mailings	11%
Online	8%
ComEd	8%
Brochure	3%
Trade Show/Seminar	2%
Other	6%
Don't Know	11%

Source: PY5 BILD End-User Customer Survey
Percentages do not sum to 100% to due to rounding.

A somewhat surprising finding is that a sizable percentage of end-users purchased discounted bulbs through the BILD program but were unaware of the discount. Similar to EPY4, approximately three-quarters of EPY5 end-users are aware that they purchased discounted bulbs, which means one in four

were unaware of the discount at the time of purchase.[68] In EPY5, 83% of customers who were aware of the discount knew that it was provided by ComEd compared to 66% in EPY4.[69]

Table 7-33. End-User Awareness of Discount

	EPY4 (n=51)	EPY5 (n=232)
Aware of discount	75%	72%
	Among % Aware (n=38)	Among % Aware (n=167)
Aware ComEd is discount sponsor	66%	83%

Source: EPY4 and EPY5 BILD End-User Customer Survey

Distributors were the main source of information about the discount. Close to three-quarters of end-users who knew that they had purchased discounted bulbs specifically mentioned that they learned about if through their distributor. But since not all were aware of the discount, only 53% of end-users who purchased discounted bulbs knew they purchased discounted bulbs because their distributor told them of the discounts. The discount can still influence those who are unaware of it; end-users who are unaware of the discount might not purchase the bulbs if they were full price. Still, it can only help the program to let customers know that they are getting a good deal on the bulbs, which could encourage them to purchase even more bulbs. The program may want to consider additional training for distributors that emphasizes how to most effectively market the program to their customers using the materials provided by the program as well as making customers aware of the discount.

An examination of the factors that end-users consider when purchasing lighting also makes clear how important it is that distributors are fully trained and make use of both program marketing and promote the discounts. We asked end-users what factors they consider when purchasing lighting for their business. The responses show that price is a factor in their purchase decisions but not the only one. The top response was the needs of the particular situation (35%), followed by price (28%) and energy efficiency (16%). Since there is an energy efficient option for nearly every situation, it is important that distributors make their customers aware of all the options available so they do not simply purchase what is already in the fixture, which was response of 16% of end-users. The 9% who say they rely on the recommendations of their sales representative are also an opportunity to make use of ComEd marketing materials.

[68] We did not find any statistically significant differences in awareness of the discount by the type of bulb purchased.

[69] Due to the small sample sizes in the EPY4 survey, this difference is not statistically significant.

Table 7-34. Factors Considered When Purchasing Light Bulbs

End-User Purchase Decisions	% of End-Users
Based on situational needs (type, wattage, preference)	35%
Based on price	28%
Based on energy efficiency	16%
Based on the bulb type already in the fixture	16%
Bulb quality/aesthetics/color	10%
Based on Sales Representative or other recommendation	9%
Lifespan	5%
Based on availability in the store	3%
Typically buy LEDs	3%
Test/Research different bulbs	3%
Other	5%
Don't Know	3%

Source: PY5 BILD End-User Customer Survey
Percentages do not sum to 100% because respondent could give more than one response.

Despite the availability of ComEd discounts on a wide variety of lighting products in EPY5, 27% of end-users who purchased discounted bulbs also purchased incandescents for their business. We asked these customers why they purchased incandescents instead of CFLs or LEDs. The responses vary based on bulb type, but the barriers to purchase are things that distributors could address with additional training (see Table 7-35). The most frequently mentioned reason for not purchasing a CFL was that the end-user did not like the appearance of the bulb in the fixture (29%). Bulb appearance is less of a barrier for LEDs (9%). A related barrier is the inability to find a CFL or LED that met their needs (26% and 21% respectively gave this response). Given the variety of specialty CFLs available, bulb appearance and availability should no longer be a barrier. More difficult barriers for CFL use are dissatisfaction with the light quality, past CFLs used, and concern over mercury. LEDs may be an alternative option for customers who simply dislike CFLs; however, the high cost of the bulbs is a significant barrier for many incandescent purchasers (42%). As LED prices continue to drop, this barrier should drop in the future. In addition, the program could encourage distributors to emphasize the short payback period and lifetime savings from LEDs. Lack of awareness of LEDs remains a barrier to purchase. Thirteen percent of end-users said they purchased incandescents instead of LEDs because they were not familiar with the bulbs. In addition, when we asked customers who did not purchase LEDs through the BILD program if they were aware of the bulbs, 20% were not.

Table 7-35. Reasons for Purchasing Incandescent Bulbs Instead of CFLs or LEDs

Reasons	CFLs	LEDs
Do not like the way CFLs/LEDs look in a fixture	29%	9%
Could not find the type of bulb I needed as a CFL/LED	26%	21%
Do not like the quality or brightness of light CFLs/LEDs produce	23%	9%
Do not like that CFLs contain mercury	23%	NA
Dissatisfied with past CFLs	22%	NA
CFLs/LEDs are too expensive	15%	42%
Unfamiliar with LEDs that replace incandescents	NA	13%

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

End-user awareness of the options, costs, and benefits also seems to be an issue for some end-users who purchase linear fluorescents. Just over one-third of end-users surveyed (34%) reported purchasing standard efficiency linear fluorescent bulbs for use in their business since June of 2012. When asked why they did not purchase high efficiency fluorescents instead, approximately one-third (32%) said the cost of high efficiency linear fluorescents was a significant reason for why they purchased standard efficiency bulbs. An equal percentage (32%) said a lack of familiarity with high efficiency linear fluorescent bulbs was a significant reason. These end-users are missed opportunities for the program. With the incentive, the price of the high efficiency bulb is the same as the standard efficiency bulb. Distributors could use some additional training to ensure they are making their customers aware that an energy efficient linear fluorescent option exists and that it will not cost them more.

7.4.4 Impact of Regulatory Changes

At the end of EPY5, more distributors felt their customers were aware of EISA than end-users reported themselves. Of the ten interviewed distributors, eight reported that their customers were very familiar or somewhat familiar with the EISA regulations. Of these eight, more than half said that the new standards are making customers more aware of energy efficient products and are forcing them to purchase more energy efficient products. One disagreed, saying there has been no change in customers' purchasing habits, while another added that in most cases his customers had already been moving to energy efficient products.

However, when we interviewed end-users, two-thirds (66%) said they aware of EISA. It is likely that EISA has not fully impacted end-user purchasing decisions given these somewhat conflicting results. Once the regulations were explained, close to two thirds (69%) of all end-users expect that the lighting products their organization installs in the future will change as a result. LEDs lead the way in terms of the types of bulbs that will replace incandescents. Approximately half of end-users expect to install LEDs (52%), one-quarter CFLs (24%) and slightly over one in ten will install linear or other fluorescents (14%). Only 2% said the phased out bulbs may be replaced with other incandescent bulbs.

Only some distributors report changing their stocking practices due to EISA. Just four out of nine said they increased their stock of energy efficient products with two mentioning that they have increased their stock of LEDs in particular. Also, three of nine said they still have 75- and 100-watt incandescent bulbs in stock.

7.4.5 Distributor Barriers and Challenges to Providing End-User Information to ComEd

Distributors were asked what barriers their organization faces in providing end-user contact information to ComEd, along with the program sales information they currently submit for program settlement. Four out of ten distributors reported they do not face any challenges in providing the end-use contact information ComEd requests. Three reported they face internal barriers resulting from the structure of their sales and record keeping systems which requires the information to be pulled manually. For one, the information is not readily available while another says the contact who makes the final purchase is not always the one most involved and knowledgeable about the whole process.

7.4.6 Effects of Expanded Program Offerings

In EPY5, the BILD program expanded to include linear fluorescent bulbs, LED bulbs and fixtures, CCFL bulbs and HID lamps. These bulb types were formerly covered under prescriptive rebates. However, these prescriptive rebates were not being taken advantage of to an appreciable degree because the burden of paperwork for distributors was too high relative to total incentive dollars received (especially for linear fluorescents, where the incentive is only $1.00 per bulb). Accordingly, these bulb types were moved to the BILD program so that paperwork transaction costs would be lower (enrolling in the program at the beginning of the year is somewhat labor intensive but the documentation for each individual transaction is minimal).

The addition of these bulb types is a significant change to the program. Including linear fluorescents in the program opens a whole new usage segment with very high sales volume potential. Because the delta watts of these bulbs are so much lower than other bulb types (a TRM based average of 5.6 watts / bulb versus 35 to 51 for other bulb types), the sales volumes are so high, and the rebates are low, there are potentially large impacts on the overall cost effectiveness of the program. Introducing LEDs, a popular new technology generally meant for the same applications as CFLs but with much higher rebates and only slightly higher delta watts, also has potential impacts on cost effectiveness. The effects of the additional bulb types are examined below.

Table 7-36 shows that the average incentive per bulb dropped from $3.68 in EPY4 to $2.81 in EPY5, a 24% decrease. This is primarily due to the large sales volumes of linear fluorescents in EPY5, which receive rebates of $1.00 per bulb. The decrease is also a result of a larger fraction of standard to specialty CFLs in EPY5 than EPY4 (44% standard in EPY5 versus 34% standard in EPY4). Because standard CFLs receive a smaller incentive than specialty CFLs, the average incentive per CFL dropped from $3.68 in EPY4 to $2.35 in EPY5. These factors cause the overall incentive per bulb to drop in EPY5 despite the large incentives for LEDs and HIDs.

Table 7-36. EPY4 and EPY5 Average Incentives per Bulb

Bulb Type	Bulb Sales		Incentives Paid		Avg. Incentive/Bulb
PY5 CFLs/CCFLs	597,438	45%	$1,401,904	38%	$2.35
PY5 LEDs	211,955	16%	$1,743,300	47%	$8.22
PY5 Linear FL	503,627	38%	$503,627	14%	$1.00
PY5 HID	2,799	0%	$47,695	1%	$17.04
PY5 Total	**1,315,819**	**100%**	**$3,696,526**	**100%**	**$2.81**
PY4 Total	**575,252**	**100%**	**$2,114,970**	**100%**	**$3.68**

Source: Evaluation Team analysis

Table 7-37 shows the EPY4 and EPY5 net energy and demand savings by bulb type and the incentive dollars per energy and demand unit (using the Research Findings). The overall incentive cost per net kilowatt-hour increased from $0.033/kWh in EPY4 to $0.050 kWh in EPY5, ***a 49% increase***. Additionally, the cost per MW increased 23% and the cost per peak MW increased 15%. Despite a 129% increase in total bulb sales and a 75% increase in incentives paid over EPY4, EPY5 saw only an 17% increase in net energy (kWh) savings, a 42% increase in net demand (MW) savings, and a 51% increase in net peak demand (peak MW) savings. This disproportionate increase of bulb sales to savings is largely due to the fact that the overall average delta watts in EPY5 was approximately half that of EPY4 (26.6 watts versus 50.6 watts). This is driven significantly by the average delta watts from linear fluorescents (38% of sales) being a mere 5.6 watts.

All else being equal, the dramatic drop in delta watts would outweigh the decrease in incentive dollars per bulb and result in a much higher cost per unit of energy, demand, or peak demand savings as compared to EPY4. However, other critical evaluation parameters[70] were also affected by the change in program design and generally had the effect of lowering the impact of reduced delta watts on overall cost effectiveness. In the case of incentive cost per kWh, a 13% decrease in average hours of use as compared to EPY4 exacerbated the increase in costs. For peak demand savings, the effect of reduced delta watts is slightly tempered by a 4% increase in the peak-load coincidence factor in EPY5. All three savings parameters are affected equally by The realization rate which increased from 0.73 in EPY4 to 0.87 in EPY5 (19%). Had the realization rate not increased, the increase in incentive costs per energy and demand unit over EPY4 would have been even larger. The increase in realization rate was primarily due to the inclusion of LED bulbs and fixtures, linear fluorescent lamps, and HID lamps which had higher installation rates (0.9 to 0.96) than CFLs. The NTGR remained consistent EPY4 to EPY5 (0.63 overall based on evaluation research). The increases in cost per net kWh and peak MW are also lessened due to an increase in Energy IE of 7% and an increase in demand IE of 4%.

[70] For this component of the evaluation we are comparing PY5 Research Findings to PY4 Research Findings.

Table 7-37. EPY4 and EPY5 Incentive Dollars per Net Energy and Demand Unit

Bulb Type	Net MWh Savings		Net MW Savings		Net Peak MW Savings		$/kWh	$/MW	$/Peak MW
PY5 CFLs/CCFLs	46,997	63%	12.4	66%	10.6	66%	$0.030	$112,808	$132,163
PY5 LEDs	18,262	25%	4.7	25%	4.0	25%	$0.095	$369,883	$431,729
PY5 Linear FL	8,380	11%	1.5	8%	1.4	9%	$0.060	$333,803	$364,982
PY5 HID	608	1%	0.1	1%	0.1	1%	$0.078	$435,567	$476,252
PY5 Total	**74,247**	**100%**	**18.8**	**100%**	**16.1**	**100%**	**$0.050**	**$197,056**	**$229,237**
PY4 Total	**63,358**	**100%**	**13.2**	**100%**	**10.7**	**100%**	**$0.033**	**$159,953**	**$198,533**

Source: Evaluation Team analysis

7.4.7 Effects of Bonus Program[71]

In February of 2013, ComEd created a new bonus program for distributors that had sold bulbs totaling more than an estimated one million kWh savings as of January 31, 2013. If the distributors were able to double the estimated kWh savings by May 31st, 2013 through continued high sales, they would receive an additional incentive equal to 10% of their total EPY5 incentive payments. As of February, 2013, there were 12 distributors with at least one million estimated kWh savings that qualified to participate in the bonus program. This section briefly examines whether the bonus program was effective at promoting additional sales for these distributors. Table 7-38 shows the bulb sales, rebate dollars and estimated kWh[72] savings in the regular period (on or before January 31st) and the bonus period (after January 31st). The percent change in bulb sales, rebate dollars received, and estimated kWh are also displayed. Any distributor with a percent change in kWh of zero percent or greater qualifies to receive the 10% bonus (highlighted cells). Nine of the 12 distributors met or exceeded the kWh savings goals of the bonus program. Those nine distributors exceeded their regular period kWh savings estimates by an average of 74%. Based on these results alone, the bonus period appears to have been successful. If it is assumed that these nine distributors would have achieved the same estimated kWh savings in the bonus program period as in the regular program period in the absence of the program,[73] the bonus program resulted in an additional 11,713,922 kWh of estimated savings for a cost of $208,594, or $0.018 per kWh.

[71] Estimated energy savings included in this section are based upon the Ex Ante Gross Savings estimates provided in the tracking data. They do not correspond to the Verified Savings or Evaluation Research estimates. The evaluation team believes for the sake of this analysis these energy savings estimates are adequate to evaluate the relative sales effects of the bonus program. Currently we do not have individual distributor-level savings estimates since that would require unique Res/NonRes splits and business type distributions for each distributor which are not currently available.

[72] Estimated energy savings included in this section are based upon the Ex Ante Gross Savings estimates provided in the tracking data.

[73] This is a simplifying assumption given that these periods were not of the same length.

Table 7-38. Bonus Incentive Program Distributor Summary

Distributor	Regular Period			Bonus Period			% Chg Bulb	% Chg Rebate	% Chg kWh
	Bulbs	Rebate Dollars	Gross kWh[74]	Bulbs	Rebate Dollars	Gross kWh			
Distributor 1	15,561	$38,770	1,959,981	31,086	$60,584	3,259,925	100%	56%	66%
Distributor 2	82,200	$226,123	6,391,165	129,370	$320,485	8,674,553	57%	42%	36%
Distributor 3	11,959	$21,064	1,039,737	10,988	$15,252	1,158,178	-8%	-28%	11%
Distributor 4	13,059	$37,987	1,715,934	6,476	$18,326	792,182	-50%	-52%	-54%
Distributor 5	21,028	$50,404	1,167,022	22,386	$54,437	1,226,883	6%	8%	5%
Distributor 6	41,082	$102,661	4,903,160	18,236	$44,229	2,321,614	-56%	-57%	-53%
Distributor 7	32,681	$41,868	1,031,673	34,479	$66,832	1,732,734	6%	60%	68%
Distributor 8	18,572	$24,386	1,511,132	45,058	$119,606	4,443,419	143%	390%	194%
Distributor 9	95,053	$318,549	11,997,481	107,052	$317,946	11,939,049	13%	0%	0%
Distributor 10	12,763	$44,488	1,540,205	51,987	$205,563	5,602,992	307%	362%	264%
Distributor 11	19,413	$62,402	1,438,079	41,253	$97,187	1,752,664	113%	56%	22%
Distributor 12	6,501	$51,888	1,164,846	5,259	$41,412	848,234	-19%	-20%	-27%
Total	369,872	$1,020,590	35,860,416	503,630	$1,361,859	43,752,427	36%	33%	22%

Source: Evaluation Team analysis

However, despite the apparent success of the Bonus program based on the above, Table 7-39 tells a different story. When compared to the non-participating distributors (only those that had sales in both the regular period and the bonus period), the increase in kWh savings in the bonus period by the non-bonus program participants is much higher than the participants. This is counterintuitive, especially given that the bonus program period was only four months whereas the regular period was eight months. It is difficult to say why program sales were generally higher in the period after January 31st, 2013, but it is clear that this trend is not unique to the bonus program participants. It is reasonable to assume that, as many of the program participants were new to the program in EPY5, it took several months for salespeople to become familiar with the program and to begin promoting the efficient bulbs.

[74] Estimated energy savings included in this table are based upon the Ex Ante Gross Savings estimates provided in the tracking data.

Table 7-39. Bonus Program Participants and Non-Participants Summary

Distributor	Regular Period			Bonus Period			% Chg Bulb	% Chg Rebate	% Chg kWh
	Bulbs	Rebate Dollars	Total kWh[75]	Bulbs	Rebate Dollars	Total kWh			
All Bonus Participants	369,872	$1,020,590	35,860,416	503,630	$1,361,859	43,752,427	36%	33%	22%
Bonus Participants Receiving Incentive	309,230	$828,054	28,076,475	473,659	$1,257,892	39,790,398	53%	52%	42%
Non - Participants	97,187	$262,657	7,359,323	143,558	$472,504	12,244,537	48%	80%	66%

Source: Evaluation Team analysis

[75] Estimated energy savings included in this table are based upon the Ex Ante Gross Savings estimates provided in the tracking data.

7.5 Future Deemed Recommendations

7.5.1 TRM Recommendations

Recommendation for TAC regarding Updates to the PY7 IL TRM

Moving forward, the evaluation team recommends updating the IL TRM based on 3-year rolling averages (if 3-years of appropriate data are available, if not few years may be used). As part of the EPY5 evaluation, the evaluation team conducted research on the parameters used in impact calculations including those in the Illinois TRM (TRM v1.0). 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 Table 7-40. It should be noted that including an up to 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, it should be noted that if a significant change is made to the BILD Program that would render the rolling average inappropriate and would justifiably warrant a change to parameter estimates away from a rolling average, it should be considered.

Table 7-40. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
Res/NonRes Split[76] by Bulb Type	CFLs/LEDs - 7%/ 93% Fixture/LF/HID – 1%/ 99%	Up to 3-year rolling average of Evaluation Research estimates (currently EPY4 and EPY5 for CFLs/LEDs and EPY5 only for others)
Installation Rates by Bulb Type	CFLs – 75.2% LEDs/HID – 90.7% Linear FL – 96.4%	Up to 3-year rolling average of Evaluation Research estimates (currently EPY4 and EPY5 for CFLs and EPY5 only for others)

Source: Navigant team analysis.

The Res/NonRes split is not currently included in the most recent version the IL TRM (Version 2.0 – Effective June 1, 2013). Deeming this parameter in future versions of the TRM would improve the verified savings realization rate by removing the uncertainty that surrounds this estimate within the calculation of verified savings. The TRM currently states "Where the implementation strategy does not allow for the installation location to be known (e.g. an upstream retail program) evaluation data could be used to determine an appropriate residential v commercial split."[77] The evaluation team recommends including a deemed Res/NonRes split based on a rolling 3-year[78] average by bulb type from the most recent evaluation research findings. This recommendation would result in a deemed Res/NonRes split of 7%/ 93% for CFLs and LEDs and 1%/ 99% for LED Fixtures, Linear Fluorescents and HID bulbs (as shown in Table 7-41 below). It is recommended that these Res/NonRes splits be included in the TRM effective for EPY7.

[76] Residential/Nonresidential (Res/NonRes)
[77] IL TRM Ver. 2.0 at p. 557.
[78] Up to 3-year average if 3 years of evaluation results are available. At this time, for the Res/NonRes split, there is 2 years of evaluation data available for CFLs and only 1 year of evaluation data for Fixtures, Linear FLs, and HID bulbs. As more data becomes available it should be averaged into the recommendation so that a rolling 3-year average is used for the parameter updates.

Table 7-41. Recommended Res/NonRes Split for ComEd

Evaluation Program Year	CFLs/LEDs		Fixtures/LF/HID	
	N	Res/NonRes Rate	N	Res/NonRes Rate
EPY4	575,252	6% / 94%	n/a	n/a
EPY5	799,871	8% / 92%	515,948	1% / 99%
Weighted Average for EPY7		**7% / 93%**		**1% / 99%**

Source: Navigant team analysis.

Version 1.0 and 2.0 of the IL TRM cite the source of first-year Installation Rate of standard and specialty CFLs as a "review of EPY1-EPY3 evaluations from ComEd and Ameren (see 'IL RES Lighting ISR.xls' for more information. The average first-year ISR for each utility was calculated weighted by the number of bulbs in the each year's survey. This was then weighted by annual sales to give a statewide assumption." The evaluation team recommends updating the deemed installation rates for BILD program bulbs annually based on a rolling 3-year average[79] from the most recent BILD evaluation research findings. This would insure the deemed installation rates are reflective of the most recent data available. As shown in Table 7-42 below, at this time there is only two years of evaluation results for CFLs and one year of results for the other bulb types, and thus the TRM updates are based on less than 3 years of results. The table below also provides the recommended 2nd and 3rd year installation rates of the remaining bulb that are not installed in EPY7. The 1st, 2nd and 3rd year ISRs sum to 98% and the breakdown between the 2nd and 3rd year installs is based upon the 54%/46% estimates that are currently used within the IL TRM.

Table 7-42. Recommended Installation Rate for ComEd

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	ISR	Bulbs	ISR	Bulbs	ISR
EPY4	575,252	73%	n/a	n/a	n/a	n/a
EPY5	597,438	78%	214,754	91%	503,627	96%
1st Year Weighted ISR for EPY7		**75.2%**		**90.7%**		**96.4%**
2nd Year ISR (PY8)		**12.3%**		**3.9%**		**0.9%**
3rd Year ISR (PY9)		**10.5%**		**3.3%**		**0.7%**

Source: Navigant team analysis.

[79] Average of most recently available evaluation data, up to 3 years.

7.5.2 SAG Recommendations

Recommendation for SAG regarding the PY7 NTGR estimate for ComEd

The NTGR for EPY5 was deemed based on a Statewide Advisory Group process. This process historically has been referencing the most recently available evaluation-based NTGR estimate as one of the primary inputs for the deemed NTGR estimate. The evaluation team recommends utilizing a weighted rolling up to 3-year average[80] of the evaluation based NTGR estimate going forward in this process. This rolling average would provide some consistency from year-to-year and would ensure that the NTGR results from any one single year do not drastically alter the resulting net savings. It should be noted that if a significant change is made to the BILD Program that would render the rolling average NTGR inappropriate, and would justifiably warrant a revised NTGR estimate away from the rolling average, this should be considered.

Table 7-43 below provides one or two years of evaluation research NTGR estimates for CFLs, LEDs/HIDs and Linear FL bulbs, as well as the 1- or 2-year weighted average which are the recommended EPY7 NTGR parameter estimates.

Table 7-43. Recommended NTGR for ComEd BILD Program

Evaluation Program Year	CFLs		LEDs/HID		Linear FL	
	Bulbs	NTGR	Bulbs	NTGR	Bulbs	NTGR
EPY4	575,252	0.63	n/a	n/a	n/a	n/a
EPY5	597,438	0.66	214,754	0.70	503,627	0.56
Weighted Average for EPY7		**0.64**		**0.70**		**0.56**

Source: Navigant team analysis.

[80] Average of most recently available evaluation data, up to 3 years.

7.6 Data Collection Instruments

7.6.1 EPY5 End-User Telephone Survey Instrument

PY5 ComEd Business Instant Lighting Discount Program Enduser Survey

Survey Variables Needed in Sample

CONTACT_NAME - End User Contact Name
EU_ORG - End User Organization Name
PHONE – End User Phone number
DISTRIBUTOR – Distributor who sold bulbs to End User
TOTAL_BULBS – total number of bulbs sold through BILD in PY5
STAND_DISC– Discount amount on Standard bulbs sold through BILD in PY5
SPEC _DISC - Discount amount on Specialty bulbs sold through BILD in PY5
CFL_NUM– total number of Screw-in CFLs sold through BILD in PY5
CFL_FLAG – 0/1 flag indicating End User was purchasing CFLs through BILD
LIN_NUM – total number of Linear FL bulbs sold through BILD in PY5
LIN _DISC - Discount amount on Linear FL bulbs sold through BILD in PY5 (all $5)
LIN_FLAG – 0/1 flag indicating End User was purchasing Linear FL through BILD
LED_NUM – total number of LED bulbs sold through BILD in PY5
LED _DISC - Discount amount on LED bulbs sold through BILD in PY5 (all $5)
LED_FLAG – 0/1 flag indicating End User was purchasing LEDs through BILD

Definitions – For Interviewer Training

Spiral CFL Bulbs – Basic spiral shaped CFL bulbs that DO NOT have special functions such as dimmable or 3-way light levels.
Specialty CFL Bulbs - CFL bulbs that either look different, such as reflectors/floods, globes, candelabra, a-lamps, or HAVE special functions such as very high wattage (35W+), dimmable, or 3-way light levels.
LED Lamps – Candelabra, globe, and MR lamps with >= 40 lumens per watt and a color rendering index >= 80. Energy Star-qualified A-lamps, PAR lamps, and R lamps with >= 52 lumens per watt and a color rendering index >= 80.
High Efficiency Linear Fluorescent - Any reduced wattage lamp with a minimum of 80 CRI that can replace a standard linear Fluorescent and be driven on existing ballast.
Replacement lamps for:
2′, 3′, 4′, and 8′ T8s – High Efficiency are 15-59 watt, predominantly 25 and 28 watt.
4′ T5′s, and 4′ T5HO – High Efficiency are 20-51 watt, predominantly 49 watt.

Screener Section

INTRO 1:
Hello, this is [SURVEYOR NAME] from Opinion Dynamics calling on behalf of Commonwealth Edison. We are not selling anything. We're conducting a study of businesses that purchased high efficiency light bulbs

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

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

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

C1. Does ComEd provide electricity to your business?

1. (Yes, ComEd)
2. (No, Someone Else) [SKIP TO C1a]
8. (Don't know) [THANK AND TERMINATE]
9. (Refused) [THANK AND TERMINATE]

C1a. Does your business receive a bill from ComEd for your electricity usage and/or delivery? [If necessary, read "Some business in this region purchase their electricity from a Retail Electric Supplier but ComEd still bills these customers for delivery of electricity"]

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

READ "During this survey we have a few questions for you about the discounted high efficiency light bulbs you purchased from [DISTRIBUTOR] through the Business Instant Lighting Discount program. From now on we will refer to this program as the BILD program. We will be focusing our questions on [If CFL_NUM > 0 READ: "CFLs", If LED_NUM > 0 READ: "LEDs", If LIN_NUM > 0 READ: "High Efficiency Linear Fluorescent"] lamps.

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

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

[**If needed:** "**High Efficiency Linear Fluorescents** are similar to standard linear fluorescents in physical appearance and light output. High efficiency 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 high efficiency LF."]

C3. According to our records, between June 1, 2012 and May 31, 2013 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) High Efficiency Linear Fluorescents", 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, 2012 and May 31, 2013?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[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, 2012 and May 31, 2013?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[ASK C4_LIN IF C3 = 2 and LIN_NUM > 0]
C4_LIN. How many discounted **High Efficiency Linear Fluorescents** would you estimate you purchased from [DISTRIBUTOR] between June 1, 2012 and May 31, 2013?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[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 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 – Linear Fluorescents
3- LEDs

C3a. Did you purchase these bulbs for use at <address> or did you purchase them for resale?
1 – use at my address
2 – resale
3 – don't know
4 – refused

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 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 bulbs did you know were discounted? [MULTIPLE RESPONSE]
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 then ask C7a]

C7a. Prior to June 1, 2012 had you ever purchased **screw-in CFLs** from [DISTRIBUTOR]?

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

[IF LIN_NUM > 0 then ask C7b]

C7b. Prior to June 1, 2012 had you ever purchased **High Efficiency Linear Fluorescent** bulbs from [DISTRIBUTOR]?

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

[**IF CUSTOMER DOESN'T KNOW DIFFERENCE BETWEEN HIGH EFFICIENCY and STANDARD EFFICIENCY LINEAR FL Read:** "High Efficiency Linear Fluorescents are similar to standard linear fluorescents in physical appearance and light output. High efficiency 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 high efficiency LF."]

[IF LED_NUM >0 then ask C7c]

C7c. Prior to June 1, 2012 had you ever purchased **LEDs** from [DISTRIBUTOR]?

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

Self-Report Free-Ridership

[ASK FR1 IF C5 = 1 or 2, ELSE SKIP TO FR1a]

FR1. How did you first find out about the price discounts offered by [DISTRIBUTOR] on high efficiency light bulbs? (DO NOT READ)

1. ([DISTRIBUTOR] employee made me aware of the discounted bulbs)
2. (Saw marketing materials in the store)
3. (Discount was advertised in mailing)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

FR1a. In the past year have you come across any informational materials from ComEd explaining the energy saving benefits of CFLs, High Efficiency Linear Fluorescents or LEDs? (If needed: "For which bulb types? CFLs, LEDs or Linear Fluorescent") (ACCEPT MULTIPLES)

1. (Yes – for CFLs)
2. (Yes – for Linear FL)
3. (Yes – for LEDs)
4. (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 "SAW MATERIALS IN STORE" PROBE FOR WHERE IN STORE)

1. (A [DISTRIBUTOR] employee made me aware of the energy savings benefits of high efficiency bulbs)
2. (On Sales Counter)
3. (In Store - general)
4. (Bill insert)
5. (Mailing – non-specific)
6. (Brochure)
7. (Online)
8. (Email)

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 as well as other factors that might have influenced your decision to purchase high efficiency bulbs from [DISTRIBUTOR]. 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.

[If BULBTYPE=1 THEN ASK N31a-g]
N31. Please rate the influence of the following factors on your decision to purchase **CFLs** instead of a less efficient alternative bulb type from [DISTRIBUTOR] over the past year:
N31a. The availability of the program discount of [STAND_DISC] per bulb for Standard CFLs and [SPEC_DISC] per bulb for Specialty CFLs
N31b. A recommendation from a [DISTRIBUTOR] salesperson
N31c. Your previous experience with CFLs
N31d. Your previous experience with ComEd's lighting discount program
[IF FR1A = 1 then ask N31e]
N31e. Informational materials from ComEd on the benefits of high efficiency lighting such as CFLs
N31f. Screw-in CFLs are Standard Practice in your industry
N31g. Corporate Policy or guidelines requiring the purchase of high efficiency lighting such as CFLs
[FOR N31a-N31g, RECORD 0-10; 96 = N/A, 98 = DK; 99 = REF]

[If BULBTYPE=2THEN ASK N32a-g]
N32. Please rate the influence of the following factors on your decision to purchase **High Efficiency Linear Fluorescents** rather than standard efficiency linear fluorescents from [DISTRIBUTOR] over the past year:
N32a. The availability of the program discount of [LIN_DISC] per bulb

N32b. A recommendation from a [DISTRIBUTOR] salesperson
N32c. Your previous experience with High Efficiency Linear Fluorescents
N32d. Your previous experience with ComEd's lighting discount program
[IF FR1A =2 then ask N32e]
N32e. Informational materials from ComEd on the benefits of high efficiency lighting such as Linear Fluorescents
N32f. High Efficiency Linear Fluorescents are Standard Practice in your industry
N32g. Corporate Policy or guidelines requiring the purchase of high efficiency lighting such as Linear Fluorescents
[FOR N32a-N32g, RECORD 0-10; 96 = N/A, 98 = DK; 99 = REF]

[If BULBTYPE=3THEN ASK N33a-f]
N33. Please rate the influence of the following factors on your decision to purchase **LEDs** instead of a less efficient alternative bulb type from [DISTRIBUTOR] over the past year:
N33a. The availability of the program discount of [LED_DISC] per bulb
N33b. A recommendation from a [DISTRIBUTOR] salesperson
N33c. Your organizations previous experience with LEDs
N33d. Your organizations previous experience with ComEd's lighting discount program
[IF FR1A =3 then ask N33e]
N33e. Informational materials from ComEd on the benefits of high efficiency lighting such as LEDs
N33f. LEDs are Standard Practice in your industry
N33g. Corporate Policy or guidelines requiring the purchase of high efficiency lighting such as LEDs
[FOR N33a-N33g, RECORD 0-10; 96 = N/A, 98 = DK; 99 = REF]

[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]

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

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

[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]

[If BULBTYPE=2]
N52. Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, what is the likelihood that you would have purchased the same number of **High Efficiency 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]

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

CONSISTENCY CHECKING
[ASK IF N31A=6-10 AND N51=6-10]
CC1a. When you answered ...<N31A> out of 10... for the question about the influence of the discount, I would interpret that to mean that the rebate was quite important to your decision to purchase **screw-in CFL**s from [DISTRIBUTOR]. Then, when you answered, <N51> out of 10 for how likely you would be to purchase the same CFLs without the discount, it sounds like the discount was not very important in your purchase decision. I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain in your own words, the role the discount played in your decision to purchase screw-in CFLs from [DISTRIBUTOR]?
[OPEN END; 98 = DK; 99 = REF]

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

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 **High Efficiency 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 **High Efficiency Linear Fluorescent** without the discount which you gave a rating of <%N52> and/or we can change both if you wish?
[OPEN END; 98 = DK; 99 = REF]

CC3a. When you answered ...<N33A> out of 10... for the question about the influence of the discount, I would interpret that to mean that the rebate was quite important to your decision to purchase **LEDs** from [DISTRIBUTOR]. Then, when you answered..<N53> out of 10 for how likely you would be to purchase the same LEDs without the discount, it sounds like the discount was not very important in your purchase decision. I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain in your own words, the role the discount played in your decision to purchase LEDs from [DISTRIBUTOR]?
[OPEN END; 98 = DK; 99 = REF]

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

YR5 Install Rate Battery

CFL INSTALL BATTERY

[IF BULBTYPE=1- then Read: "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 2012 and May 2013" and **ASK CFL INSTALL BATTERY**]

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 = 2]

IN1a. Does your organization install the program bulbs you purchased for your clients or do your clients install the bulbs themselves?

1. We/ My organizations Install
2. Clients Install [SKIP TO BUS]
3. A mix of both
8. (Don't know) [SKIP TO BUS]
9. (Refused) [SKIP TO BUS]

G1a. What percentage of these <CFL_NUM> CFLs would you estimate have been installed? (DO NOT READ)

1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)
7. (1-9%)
8. (None)
98. (Don't know)
99. (Refused)

[IF IN1A=3 OR 2 SKIP TO BUS]

G6a. 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 G7a IF G6a = 2]

G7a. What percentage of installed CFLs would you estimate have been removed? (DO NOT READ)

1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)

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

[Ask G8a IF G6a = 2 OR 3]
G8a. Why did you remove the CFL(s)? (DO NOT READ)(ACCEPT MULTIPLE)

1. (Burned out/stopped working/broke)
2. (Did not like the color)
3. (Took too long to start up)
4. (Not bright enough)
5. (Didn't like the way it looked)
6. (Didn't fit in the fixture)
7. (Moved bulb to another location)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK G2a IF G1a<> 1, 98, OR 99]
G2a. Where are the screw-in CFLs that have not been installed? (DO NOT READ) [MULTIPLE RESPONSE. ACCEPT UP TO 4 RESPONSES]

1. (In Storage)
2. (Broken)
3. (Installed in a residential location)
4. (Returned to store)
5. (Installed but later removed)
6. (Given Away)
7. (Lost)
8. (Installed Elsewhere but not in residential location)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

G5a. In the majority of instances, what type of bulbs did the new CFL(s) replace? Would you say…

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

LINEAR FL INSTALL BATTERY

[IF BULBTYPE=2- then Read: "For the next set of questions I'd like you to think about [LIN_NUM] high efficiency Linear fluorescent lamps that you purchased from [DISTRIBUTOR] between June 2012 and May 2013" and **ASK LF INSTALL BATTERY**]

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

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

[ASK If QC3a = 2]
IN1b. Does your organization install the program bulbs you purchased for your clients or do your clients install the bulbs themselves?

1. We/My organization Install
2. Clients Install [SKIP TO BUS]
3. A mix of both
8. (Don't know) [SKIP TO BUS]
9. (Refused) [SKIP TO BUS]

G1b. What percentage of these < *LIN* _NUM> Linear fluorescent lamps would you estimate have been installed? (DO NOT READ)

1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)
7. (1-9%)
8. (None)
98. (Don't know)
99. (Refused)

[IF IN1B=3 OR 2 SKIP TO BUS]
G6b. 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 G7b IF G6b = 2]
G7b. What percentage of installed Linear fluorescent would you estimate have been removed? (DO NOT READ)

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

0. (Other Specify)
8. (Don't know)
9. (Refused)

[Ask G8b IF G6b = 2 OR 3]
G8b. Why did you remove the linear fluorescent bulbs? (DO NOT READ)(ACCEPT MULTIPLE)

1. (Burned out/stopped working/broke)
2. (Did not like the color)
3. (Took too long to start up)
4. (Not bright enough)
5. (Moved bulb to another location)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[ASK G2b IF G1b<> 1, 98, OR 99]
G2b. Where are the Linear fluorescent lamps that have not been installed? (DO NOT READ) [MULTIPLE RESPONSE. ACCEPT UP TO 4 RESPONSES]

1. (In Storage)
2. (Broken)
3. (Installed in a residential location)
4. (Returned to store)
5. (Installed but later removed)
6. (Given Away)
7. (Lost)
8. (Installed Elsewhere, but not into a residential location)
00. (Other, Specify) [OPEN END]
98. (Don't know)
99. (Refused)

LED INSTALL BATTERY
[IF BULBTYPE=3- then Read: "For the next set of questions I'd like you to think about the [LED_NUM] LEDs that you purchased from [DISTRIBUTOR] between June 2012 and May 2013" and **ASK LED INSTALL BATTERY**]

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

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

[ASK If QC3a = 2]
IN1C. Does your organization install the program bulbs you purchased for your clients or do your clients install the bulbs themselves?

1. We Install
2. Clients Install [SKIP TO BUS]
3. A mix of both
8. (Don't know) [SKIP TO BUS]
9. (Refused) [SKIP TO BUS]

G1c. What percentage of these <LED_NUM> LEDs would you estimate have been installed? (DO NOT READ)

1. (100%)
2. (90-99%)
3. (80-89%)
4. (50-79%)
5. (20-49%)
6. (10-19%)
7. (1-9%)
8. (None)

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

[IF IN1C=1 OR 2 SKIP TO BUS]

G6c. Are all of these LEDs still installed or have some been removed?

1. All still in place
2. Removed some
3. (Removed all)

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

[ASK G7c IF G6c = 2]

G7c. What percentage of installed LEDs would you estimate have been removed? (DO NOT READ)

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

0. (Other Specify)

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

[Ask G8c IF G6c = 2 OR 3]

G8c. Why did you remove the LEDs(s)? (DO NOT READ)(ACCEPT MULTIPLE)

1. (Burned out/stopped working/broke)
2. (Did not like the color)
3. (Took too long to start up)
4. (Not bright enough)
5. (Didn't like the way it looked)
6. (Didn't fit in the fixture)
7. (Moved bulb to another location)

0. (Other, Specify) [OPEN END]

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

[ASK G2c IF G1c<> 1, 98, OR 99]

G2c. Where are the LEDs that have not been installed? (DO NOT READ) [MULTIPLE RESPONSE. ACCEPT UP TO 4 RESPONSES]

1. (In Storage)
2. (Broken)
3. (Installed in a residential location)
4. (Returned to store)
5. (Installed but later removed)
6. (Given Away)
7. (Lost)
8. (Installed Elsewhere, but not in a residential location)

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

G5c. 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)

Bus. What is the main business activity of the location where the high efficiency bulbs you purchased from [DISTRIBUTOR] will be installed? [PROBE IF NECESSARY]

1. (Office)
2. (Apartments/Condos)
3. (Retail/Service)
4. (Restaurant)
5. (Hotel/Motel)
6. (Medical/Hospital)
7. (Grocery)
8. (Industrial)
9. (Warehouse)
10. (High School/Middle School)
11. (Elementary School)
12. (College/University)
13. (Garage)

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

[IF BUS = 2 or 5 AND ASK APT1a]

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, or

3. In An Exterior Location
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[IF BUS = 2 or 5 AND ASK APT1b]
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, or
3. In An Exterior Location
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

[IF BUS = 2 or 5 AND LED_FLAG = 1 ASK APT1c]
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, or
3. In An Exterior Location
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

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

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

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

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

Self-Report Spillover

SO1. In the time since you purchased the discounted high efficiency light bulbs from [DISTRIBUTOR] has your organization purchased [IF IN1C DOES NOT= 2 READ "and installed"] any other efficient lighting products for your business [IF C3a=2 include "or for your customers"] at regular retail price, <u>without</u> any discounts?

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

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

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

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

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

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

SO1c. Did you purchase any non-discounted **High Efficiency Linear Fluorescent** bulbs (remember that high efficiency Linear Fluorescents are similar to standard linear fluorescents in physical appearance and light output. High efficiency 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 high efficiency LF)?

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

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

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

[ASK SO2a IF SO1a = 1]
SO2a. Approximately how many non-discounted **Standard CFLs** would you estimate have been purchased for your business [IF C3a=2 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[ASK SO2b IF SO1b = 1]
SO2b. Approximately how many non-discounted **Specialty CFLs** would you estimate have been purchased for your business [IF C3a=2 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[ASK SO2c IF SO1c = 1]
SO2c. Approximately how many non-discounted **High Efficiency Linear Fluorescent** bulbs would you estimate have been purchased for your business since you purchased the discounted light bulbs from [DISTRIBUTOR]?
[NUMERIC OPEN END; 98 = DK; 99 = REF]

[ASK SO2d IF SO1d = 1]
SO2d. Approximately how many non-discounted **LEDs** would you estimate have been purchased for your business [IF C3a=2 include "or for your customers"] since you purchased the discounted light bulbs from [DISTRIBUTOR]?

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

[ASK SO3 IF SO1 = 1, ELSE SKIP TO P4] [SKIP IF C3a=2]
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]

[ASK SO4 IF SO1 = 1, ELSE SKIP TO P4]
SO4. Why did you purchase these lighting products at regular retail price and not a discounted price? (DO NOT READ) [MULTIPLE RESPONSE]

1. (The price discounts had ended)
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 CFL User Section

P4. On a scale of 0 to 10 where 0 means you were "not at all satisfied" and 10 means "very satisfied", how satisfied are you with the discounted light bulbs you purchased from [DISTRIBUTOR] between June 2012 and May 2013?

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

[ASK P5 IF P4 < 5]
P5. Why aren't you satisfied? [DO NOT READ]

1. (Delay when the lights turn on)
2. (Had to replace because it burned out)
3. (Do not like light - general response)
4. (Dim/not bright enough)
5. (Do not last long)
6. (Do not fit socket)
0. (Other, Specify) [OPEN END]
8. (Don't know)
9. (Refused)

Purch1. When selecting bulbs for your business [IF C3a=2 include "or for your customers"], how do you typically decide which bulbs to buy? (DO NOT READ LIST) [MULTIPLE RESPONSE]

1. (I typically buy CFLs)
2. (I typically buy incandescents)
3. (I typically buy LEDs)
4. (I typically buy Linear Fluorescent bulbs)
5. (Based on what I need (type, wattage))
6. (Based on price)
7. (Based on what is on Sale)
8. (Based on availability in the store)

9. (Based on Energy Efficiency)
10. (Based on the bulb type already in the fixture)
11. (Based on sales rep or other recommendation)

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

OT1. Have any regular screw-in incandescent bulbs been purchased for your business [IF C3a=2 include "or for your customers"] since June of 2012?

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

OT2. Have any standard efficiency linear fluorescent bulbs been purchased for your business [IF C3a=2 include "or for your customers"] since June of 2012, such as a 32 Watt Linear Fluorescent rather than a high efficiency 28 Watt bulb?

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=2 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. CFLs are too expensive
- CFLBar2. Dissatisfied with past CFLs
- CFLBar3. Do not like the way CFLs look in a fixture
- CFLBar4. Do not like the quality or brightness of light CFLs produce
- CFLBar5. Do not like that CFLs contain mercury
- CFLBar6. Could not find the type of bulb I needed as a CFL

CFLBar7**.** Are there any other factors that were not mentioned that have resulted in you purchasing incandescent bulbs for your business rather than CFLs?

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

[ASK LEDBAR1-LEDBAR6 IF OT1 = 1]

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

- LEDBar1. LEDs are too expensive
- LEDBar2. Unfamiliar with LED bulbs that replace standard incandescents
- LEDBar3. Do not like the way LEDs look in a fixture
- LEDBar4. Do not like the quality or brightness of light LEDs produce
- LEDBar5. Could not find the type of bulb I needed as a LED

LEDBar6**.** Are there any other factors that were not mentioned that have resulted in you purchasing incandescent bulbs for your business rather than LEDs?

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

[ASK LINBAR1-LINBAR3 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 high efficiency linear fluorescent for your business [IF C3a=2 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. High Efficiency Linear Fluorescent bulbs are too expensive
- LINBar2. Unfamiliar with High Efficiency 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 high efficiency linear fluorescent for your business?
[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 light bulbs?

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

[SKIP IF LED1=2]
LED2. Have you ever purchased [IF IN1C DOES NOT= 2 READ "and installed"] screw-in LED bulbs in your business [IF C3a=2 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 phasing in starting in January of 2012? The new regulations will be phased in over 3 years and started in January of 2012 with the requirement that bulbs providing the brightness of a traditional 100-watt incandescent bulb provide that same light level using 72-watts or less, a 30% reduction in energy". 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=2 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?
[OPEN END; 98 = DK; 99 = REF]

Firmographics

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

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

1. Less than 2,500 square feet
2. 2,500 but less than 5,000 square feet
3. 5,000 but less than 10,000 square feet
4. 10,000 but less than 20,000 square feet
5. 20,000 but less than 50,000 square feet

6. 50,000 but less than 100,000 square feet
7. Agricultural/Outdoors
8. (Don't know)
9. (Refused)

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

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

[ASK F2A IF F2 <> 1]

F2a. Does your company pay the electric bill?

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

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

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

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

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

FINAL. ComEd is continually looking for ways to enhance its energy efficiency programs. Do you have any suggestions for improving their Business Instant Lighting Discounts Program? [OPEN END; 98 = DK; 99 = REF]

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

7.6.2 EPY5 Distributor Interview Guide

PY5 ComEd Business Instant Lighting Discounts Program

Distributor Interview Instrument

Definitions

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

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

LED Lamps – Candelabra, globe, and MR lamps with >= 40 lumens per watt and a color rendering index >= 80. Energy Star-qualified A-lamps, PAR lamps, and R lamps with >= 52 lumens per watt and a color rendering index >= 80.

Screw-in LED Trim Kits - Any retrofit trim kit to convert a recessed down-light from incandescent to LED using an Edison base socket lamps with >= 40 lumens per watt and a color rendering index >= 80.

Ceramic Metal Halide (HID) - Any reduced wattage lamp with >= 85 lumens per watt and a color rendering index >= 80 that can replace a standard wattage lamp and can be driven on an existing ballast.

Linear Fluorescent - Any reduced wattage lamp with a minimum of 80 CRI that can replace a standard lamp and be driven on existing ballast. (T5 20-51 watt, predominantly 49 watt; T8 15-59 watt, predominantly 25 and 28 watt. Replacement lamps for 2', 3', 4', and 8' T8s, 4' T5's, and 4' T5HO).

Introduction

Hello. This is _____calling from Opinion Dynamics Corporation on behalf of ComEd as part of the evaluation of its Commercial and Industrial Business Instant Lighting Discounts program.

The purpose of the interview is to learn about your company's participation in ComEd's Business Instant Lighting Discounts program, also known as the BILD program, and to understand how this program has impacted your sales of program qualifying bulb types. Are you the person most knowledge about your organizations participation in ComEd's BILD program? The interview will take about 1 hour and information that is provided will remain strictly confidential.

During this survey we will be talking about both the most recent program year, which is running from June 1st 2012 through May 31st 2013, and the previous program year (June 1st 2011 through May 31st 2012). The BILD program was expanded significantly for the current program year by adding Linear FL, Metal Halide and LED bulbs to the list of program qualifying bulbs.

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

Program Participation

1. When did you first get involved with the ComEd Business Instant Lighting Discounts program (formerly Midstream Incentive Program)?
   a. How did you first hear about this program offering?
   b. [If **NA_Dist = Yes**] Our records indicate you are a nationwide distributor of lighting products. What made you decide to participate in a regional rebate program?
   c. [If **NA_Dist = Yes**] Do you offer ComEd discounts to all of your customers in ComEd's service territory?

2. What were your primary reasons for getting involved with ComEd's Business Instant Lighting Discounts program (from now on referred to as the BILD program)?
   a. What do you see as the main benefits of participating for your organization?
   b. For your customers' organizations?

3. [IF **PY4_Sales = 0**] According to our records you did not sell any program bulbs prior to the current program year (which started June 1, 2012). Is this correct?
   a. Were you aware of the program in prior years?
   b. [If Yes] Why didn't you participate?
   c. [IF PY5_CFLSales > 0] Did you sell CFLs prior to June 2012?

4. [If **PY5_LFsales > 0**] How important was the inclusion of Linear FL bulbs in your decision to participate in the BILD program year this year? Was it, VERY IMPORTANT, SOMEWHAT IMPORTANT, SLIGHTLY IMPORTANT or NOT AT ALL IMPORTANT?
   a. [If somewhat or very important] Why do you say this?
   b. [If not at all] Why not?

5. [If **PY5_LEDsales > 0**] How important was the inclusion of LED bulbs in your decision to participate in the BILD program year this year? Was it, VERY IMPORTANT, SOMEWHAT IMPORTANT, SLIGHTLY IMPORTANT or NOT AT ALL IMPORTANT?

a. [If somewhat or very important] Why do you say this?
b. [If not at all] Why not?

Distributor Delivery Method and Customer Classification

I'm interested in learning a little more about your organization and the customers to whom you sell light bulbs…

6. **Sales logistics** – What sales channels are used most frequently by your customers to purchase light bulbs?

a. Do they primarily place orders through your retail sales desk, inbound telephone orders, internet orders, outbound sales rep contact, or some other way?
b. Who typically does the purchasing for your customers? (managers, owners, facilities personnel, contractors, or somebody else)
c. How involved is your organization in helping your customers determine which light bulbs to purchase?
d. Are there opportunities for your organization to promote high efficiency bulbs?

7. **Target Market** – Does your organization focus your lighting sales to any business type categories (such as Offices, Restaurants, Retail stores)?

a. [If Yes] What are the top three business types of customers serviced by your organization?
    i. Condo/Co-Op/Apartment– if selected, do you have a sense of whether these program bulbs are being installed in common spaces or individual tenant units?
    ii. Office,
    iii. Restaurant,
    iv. Retail/Grocery/Liquor,
    v. Warehouse,
    vi. Hospital/Health care,
    vii. School K-12/College,

viii. Hotel/Motel,
ix. Public assembly e.g. church/theater/conference,
x. Industrial/agriculture
xi. Other

b. What proportion of total light bulbs would you guess are sold to these three business types (to each type and overall)?

Distributor Bulb Sales

8. **Product sales** -What percentage of your organization's total revenue comes from light bulb sales?

a. Approximately how many light bulbs does your organization sell per year?
b. I'm going to read a list of five different bulb types. Could you please tell the percentage of your total bulb sales that each bulb type makes up? I'll read them all through once and then again for you to provide a percentage for each. [Rough approximations are fine – just want a general sense]
    i. Incandescent - ____%
    ii. Standard CFL - ____%
    iii. Specialty CFL - ____%
    iv. Linear FL - ____%
    v. LED - ____%
c. What proportion of your organization's sales are in 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.]
d. How do you ensure BILD program bulbs are sold exclusively to ComEd customers?

PY5 Program Bulb Sales

[**IF PY5_sales > 0,** GO THROUGH THIS QUESTION FOR EACH PROGRAM BULB TYPE SOLD IN PY5 - STANDARD CFLs / SPECIALTY CFLs / LEDs / HIGH EFFICIENCY LINEAR FLUORESCENT BULBS]

9. [If PY5_StanCFL > 0] According to our records during the current BILD program year, your organization sold [**PY5_StanCFL**] STANDARD CFLs through the program. If the BILD incentives and promotional materials had not been available

do you think your organization would have still sold all of these STANDARD CFLs, some of them or none of them? [All of them, Some of them, Some of them]

a. [If Q9 = Some of them] Approximately how many of the [**PY5_StanCFL**] STANDARD CFLs would you have sold in absence of the program?
b. [If Q9 = None, then StanCFLInc = **PY5_StanCFL,** If Q9 = Some, then StanCFLInc = **PY5_StanCFL** – Q9a] Do you think the customers who purchased the incremental [StanCFLInc] STANDARD CFLs would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]
c. [If Both] What percent of the incremental [StanCFLInc] STANDARD CFL sales do you think would have been non-efficient bulb sales in the absence of the program?
d. [If Q9 = All of them] So am I understanding you correctly that you do not think the BILD incentives or promotional materials led to any increase in STANDARD CFL sales over what your organization would have sold in the absence of the program?
e. [If No] Please explain in your own words the impact of the BILD incentives or promotional materials on your sales of STANDARD CFLs.

10. [If **PY5_SpecCFL** > 0] According to our records during the current BILD program year, your organization sold [**PY5_SpecCFL**] SPECIALTY CFLs through the program. If the BILD incentives and promotional materials had not been available do you think your organization would have still sold all of these SPECIALTY CFLs, some of them or none of them? [All of them, Some of them, Some of them]

a. [If Q10 = Some of them] Approximately how many of the [**PY5_SpecCFL**] SPECIALTY CFLs would you have sold in absence of the program?
b. [If Q10 = None, then SpecCFLInc = **PY5_SpecCFL,** If Q10 = Some, then SpecCFLInc = **PY5_SpecCFL** – Q10a] Do you think the customers who purchased the incremental [SpecCFLInc] SPECIALTY CFLs would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]
c. [If Both] What percent of the incremental [SpecCFLInc] SPECIALTY CFL sales do you think would have been non-efficient bulb sales in the absence of the program?

d. [If Q10 = All of them] So am I understanding you correctly that you do not think the BILD incentives or promotional materials led to any increase in SPECIALTY CFL sales over what your organization would have sold in the absence of the program?
e. [If No] Please explain in your own words the impact of the BILD incentives or promotional materials on your sales of SPECIALTY CFLs.

11. [If **PY5_LEDSales** > 0] According to our records during the current BILD program year, your organization sold [**PY5_LEDSales**] LEDs through the program. If the BILD incentives and promotional materials had not been available do you think your organization would have still sold all of these LEDs, some of them or none of them? [All of them, Some of them, Some of them]

a. [If Q11 = Some of them] Approximately how many of these [**PY5_LEDSales**] LEDs would you have sold in absence of the program?
b. [If Q11 = None, then LEDInc = **PY5_LEDSales,** If Q11 = Some, then LEDInc = **PY5_LEDSales** – Q11a] Do you think the customers who purchased the incremental [LEDInc] LEDs would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]
c. [If Both] What percent of the incremental [LEDInc] LEDs sales do you think would have been non-efficient bulb sales in the absence of the program?
d. [If Q11 = All of them] So am I understanding you correctly that you do not think the BILD incentives or promotional materials led to any increase in LED sales over what your organization would have sold in the absence of the program?
e. [If No] Please explain in your own words the impact of the BILD incentives or promotional materials on your sales of LEDs.

12. [If **PY5_LFSales** > 0] According to our records during the current BILD program year, your organization sold [**PY5_LFSales**] HIGH EFFICIENCY LINEAR FLUORESCENT BULBS through the program. If the BILD incentives and promotional materials had not been available do you think your organization would have still sold all of these HIGH EFFICIENCY LINEAR FLUORESCENT BULBS, some of them or none of them? [All of them, Some of them, Some of them]

a. [If Q12 = Some of them] Approximately how many of these [**PY5_LFSales**] HIGH EFFICIENCY LINEAR FLUORESCENT BULBS would you have sold in absence of the program?

b. [If Q12 = None, then LFInc = **PY5_LFSales,** If Q7 = Some, then LFInc = **PY5_LFSales** – Q12a] Do you think the customers who purchased the incremental [LFInc] HIGH EFFICIENCY LINEAR FLUORESCENT BULBS would have purchased a non-efficient equivalent bulb from your organization or would they have purchased fewer bulbs from your organization in the absence of the program? [Non-efficient equivalent bulb, Purchased fewer bulbs, Both, Other]
c. [If Both] What percent of the incremental [LFInc] HIGH EFFICIENCY LINEAR FLUORESCENT BULBS sales do you think would have been non-efficient bulb sales in the absence of the program?
d. [If Q12 = All of them] So am I understanding you correctly that you do not think the BILD incentives or promotional materials led to any increase in HIGH EFFICIENCY LINEAR FLUORESCENT BULB sales over what your organization would have sold in the absence of the program?
e. [If No] Please explain in your own words the impact of the BILD incentives or promotional materials on your sales of HIGH EFFICIENCY LINEAR FLUORESCENT BULBS.
f. How do the majority of your customers buying Linear fluorescent bulbs determine which Linear fluorescent to purchase?
g. Has the program changed this selection process in any way?
h. What percentage of your Linear FL sales prior to the program were the high efficiency linear FL bulbs (F28T8, F59T8, F26T5 or F51T5 or better)?
i. What percentage of your Linear FL sales are now high efficiency linear FL bulbs?
j. Without the ComEd discount, how much more expensive is a high efficiency Linear FL bulb than a standard efficiency linear FL bulbs?
k. According to a ComEd pamphlet detailing the BILD program, the annual electricity savings from installing a single F28T8 over an F32T8 is $1.38 per year (assuming an average ComEd rate). Assuming an incremental cost $2 for an efficient Linear Fl bulb, this upgrade would pay for itself in just over a year without an incentive. Over the lifetime of the bulb, it would pay for itself at least 4 times over (assuming a lifetime of 27,000 hours and 4380 hours per year). Are your customers aware of these potential savings resulting from the purchase of high efficiency Linear FL bulbs?
l. In your opinion, what is keeping customers from switching to high efficiency linear FL bulbs in the absence of the rebate?

13. [IF CHANGE not equal to missing] Our data shows your organization's sales of ComEd discounted Standard and/or Specialty CFL sales have [CHANGE]

significantly from the last program year to this program year. What factors played a role in this [CHANGE]?

Efficient Light Bulb Sales

14. 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 standard efficiency light bulbs?

a. [If yes] What have you done to actively sell high efficiency bulbs?
b. Using a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant, how significant was the existence of ComEd's BILD program and incentives in your organizations decision to actively try and increase efficient light bulb sales?

15. [If StanCFLInc + SpecCFLInc + LEDnc + LFInc > 0] How important were the following factors in increasing your organization's sales of energy efficient bulbs in ComEd's service territory between June 1, 2012 and May 31, 2013. Please use a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant.

a. Utility incentive program? Why?
b. Media stories promoting the use of efficient lighting bulbs? Why?
c. Consumer awareness about being green/global warming? Why?
d. Desire to reduce energy costs? Why?
e. Was anything else a major factor? What?

16. During this past program year (June 1, 2012 – May 31, 2013) did you sell any high efficiency light bulbs in ComEd's service territory that did not receive discounts from the BILD program?

a. [If yes] Why did these bulbs not receive discounts?
b. [If yes] What effects, if any, did the BILD program have on your sales of any high efficiency non-program bulbs?
c. [If Yes] Can you estimate the % increase in sales you experienced of non-program high efficiency bulbs that can be attributed to the program?

Program Marketing

17. What types of ComEd marketing materials promoting the BILD program do you have available for customers?

a. How are they displayed?
b. What type of support does ComEd offer you to assist you with your participation in this program?

18. Are customers aware that the bulbs they are purchasing are discounted?

a. [If yes] Are customers aware that ComEd is the source of the bulb discount?
b. Do you use the discount as a marketing tool?
c. If so, how?
d. Do you pass the entire ComEd incentive along to your customers?
e. Why?

Program Satisfaction

19. Finally I would like to find out your level of satisfaction with various elements of ComEd's BILD program. Please answer these questions using a 0 to 10 scale, where 0 means very dissatisfied and 10 means very satisfied. **[**IF ANY RATING = 0 to 5 ASK: Why do you say that?]

a. How satisfied were you with the enrollment process – that is, the process of discussing the program with a program representative and signing your organization up as an official program bulb distributor? [Who handled your enrollment - ComEd or APT?]
b. How satisfied have you been with the program sales tracking process – that is, the process used to track the sales of program discounted products by your organization?
c. How satisfied are you with the incentive processing aspect of the program? [The time from program bulb sales to payment receipt]
d. How satisfied are you with the sales that the program incentives have generated for your organization?
    i. Did the sales meet your expectations? Exceed expectations?
    ii. Caused any issues with your inventory levels?
    iii. Has the BILD program helped you acquire new customers?
e. How satisfied are you overall with the incentives offered for program bulbs?
    i. Specifically how satisfied are you with the incentives for standard CFL bulbs? [Incentives were $2 in PY4 and decreased to $1 in PY5]
    ii. How satisfied have you been with the incentives offered for specialty CFL bulbs? [Incentives were $5 in PY4 and decreased to $3 in PY5]
    iii. How satisfied have you been with the incentives offered for LED lamps and fixtures?
    iv. How satisfied have you been with the incentives offered for linear fluorescents? [Incentives are $1]
f. Do you feel the discount offered by ComEd is sufficient to induce your customers to buy efficient products instead of a non-efficient equivalent? If not, how much would the discount have to be to do so?
g. How satisfied have you been with the program managers and other staff involved in the BILD program?

h. How would you rate your level of satisfaction with the program in general?

20. Does your organization plan to participate in PY6 (starting June 1st, 2013 and running through May 31, 2014)?

21. You should have received a spreadsheet containing a sample of PY5 program sales records for which we need your organization to append customer contact information (contact name and telephone number) for evaluation purposes. When do you anticipate you will be able to provide this information?

22. To allow us to evaluate the effectiveness of the program, it is important that ComEd is able to receive contact information of the customers who purchase products through the BILD program. Is there a process that would make it easier for you to collect and provide this information to ComEd on a regular basis?

a. What barriers does your organization face in providing customer information to ComEd along with program sales?

23. Have you encountered any challenges resulting from your participation in the BILD program? [Effect on sales margin, difficulty meeting data tracking requirements, burden of paperwork, etc.]

a. How were these challenges addressed?

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

EISA 2007 Legislation

25. In 2007, Congress passed a law to set higher energy standards for light bulbs. The law phases out 40 to 100 watt standard incandescent light bulbs over 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?

a. How have the bulbs you stock and sell changed as a result of these new standards?
b. How have customers purchasing behaviors changed as a result of these new standards?
c. Do you still have regular 100 Watt incandescent bulbs in your inventory?
d. What about regular 75 Watt bulbs?
e. Using a 0 to 10 scale, where 0 is not at all significant and 10 is extremely significant, how significant are the new EISA 2007 standards affecting your organizations sales of program bulbs?

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