

# One Change CFL Distribution Program PY6 Evaluation Report

Final

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

Presented to  
Commonwealth Edison Company

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## E. Executive Summary

This report presents a summary of Navigant’s findings and results from the Impact and Process Evaluation of Program Year 6 (PY6)<sup>1</sup> One Change CFL Distribution program (One Change). The One Change program is a third party, community-based energy efficiency program which distributed CFL light bulb packs to customers least likely to respond to typical lighting offers in the Commonwealth Edison (ComEd) service territory. This program was a response to the ComEd Third-Party Efficiency Program RFP and was implemented by One Change with support from Sageview Associates. One Change will not continue operating as a ComEd program in PY7.

### E.1. Program Savings

Table E-1 summarizes the program results.

**Table E-1. PY6 Program Results**

Savings Category	
Ex Ante Gross Savings (kWh)	5,546,070
Ex Ante Gross Peak Demand Reduction (kW)	NA
Verified Gross Savings (kWh)	3,908,292
Verified Gross Peak Demand Reduction (kW)	389
Verified Gross Demand Reduction (kW)	3,687
Verified Gross Realization Rate, Savings	70%
Net to Gross Ratio (NTGR)	0.60†
Verified Net Savings (kWh)	2,335,716
Verified Net Peak Demand Reduction (kW)	232
Verified Net Demand Reduction (kW)	2,204

Source: ComEd tracking data and Navigant team analysis.

† An evaluated value

### E.3. Program Volumetric Detail

The implementer tracked its savings in a tracking system referred to as iChange (referred to here as “iChange” or “Tracking System”). In an attempt to monitor the distribution of CFLs, One Change designed iChange to record the latitude and longitude of a participant’s home when the field staff delivered CFLs – this entry was executed via an iPad device with the iChange application. In the course of the evaluation team’s review of the tracking system data, we noted that many of the latitude and longitude entries were missing. Of the 26,730 entries in the Tracking System, 7,339 (or 27.5%) did not include the latitude and longitude data. In conducting the telephone interviews, Navigant found that the majority of respondents did not remember receiving the CFL light bulbs (e.g., 102 out of 124 respondents noted they had not received the bulbs). Based upon the low recall in the telephone interview and the lack of tracking data, only 72.5% of the homes can be verified to have received the CFLs. The evaluation team

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

determined that the program distributed 115,329 (158,904 bulbs claimed) bulbs to 19,391 households (out of a total of 26,730 households claimed) as shown in the following table (Table E-3).

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

Participation	Quantity
Total Bulbs Delivered, Claimed	158,904
Total Bulbs Delivered, Evaluated	115,329
Number of CFL 6-Packs Delivered, Evaluated	19,052
Number of CFL 3-Packs Delivered, Evaluated	339
Total Households, Evaluated	19,391

Source: ComEd tracking data and Navigant team analysis.

#### E.4. Results Summary

The following table (Table E-3) summarizes the key metrics from PY6.

**Table E-3. PY6 Key Metrics Summary**

Participation	Units	Value
Net Savings	kWh	2,335,716
Net Peak Demand Reduction	kW	232
Net Demand Reduction	kW	2,204
Gross Savings	kWh	3,908,292
Gross Peak Demand Reduction	kW	389
Gross Demand Reduction	kW	3,687
Program Realization Rate	%	70%
Program NTG Ratio †	#	0.60
CFLs Distributed	#	115,329
Customers Touched	#	19,391

Source: ComEd tracking data and Navigant team analysis.

† A researched value.

#### E.5. Findings and Recommendations

The following provides insight into key program findings and recommendations.<sup>2</sup> Overall, the program achieved net savings of 2,335,716, falling short of the program net goal of 3,874,902 kWh. Participants we spoke to via the telephone survey were satisfied with the CFL bulbs.

<sup>2</sup> Numbered findings and recommendations in this section are the same as those found in the Findings and Recommendations section of the evaluation report for ease of reference between each section.

### Gross Impact Analysis

**Finding 1.** One Change achieved gross verified energy savings of 3,908,292 kWh, gross peak demand savings of 389 kW, and gross demand savings of 3,687 kW.

### Realization Rate

**Finding 2.** There was a difference between ex-ante and verified energy savings of 30%. This is due to (1) the ex-ante savings were calculated at the generator since the implementer used savings values based upon ComEd at the generator savings (savings at the generator are slightly higher, as compared to at the meter savings, since line losses have to be subtracted from the meter savings), and (2) the Tracking System and phone survey did not provide adequate information to verify all bulbs delivered (the evaluation team verified 115,329 bulbs of the 158,904 claimed bulbs).

### Program Tracking Data

**Finding 3.** Of the 26,730 entries in the Tracking System, 7,339 (or 27.5%) entries did not have the latitude or longitude data (geo-tracking), which was part of the installation verification. This could be due to (1) the application malfunctioning, (2) a lack of cellular reception when distributing the bulbs, (3) the field staff noted, for a number of homes, it was too cold to enter the geo-tracking information at each individual address (light bulbs were distributed during November 2013 – January 2014), or (4) non-delivery. The iChange tracking system failed in the field during delivery of the bulbs and much of the data was entered without any official geo-tracking stamp that could be verified by evaluation. Thus, the evaluation team could only verify 115,329 bulbs of the 158,904 claimed by the implementer.

**Recommendation 1.** Navigant recommends in future years that ComEd verify that this or similar tracking systems are functioning and recording all necessary fields for verification during the course of the program year. If a tracking system is wireless, there should be a back-up form of verification provided to the field staff (e.g., parallel (simple) spreadsheet or paper form). Navigant also recommends distributing the CFLs during more clement weather, which may lead to improved data as well as additional customer engagement.

### Program Delivery

**Finding 4.** Of the 124 customers contacted for the participant survey, 82% did not remember receiving the light bulb pack. This could be due to (1) we did not speak with the person who received the bulbs, or (2) some bulbs were left at the door rather than being handed to a resident. Those bulbs left at the door may not have made the same impression on the customer, or (3) amount of time that had lapsed from receiving bulbs to the follow-up survey (approximately 10 months).

**Recommendation 2.** Navigant recommends that for similar programs, ComEd conduct some form of follow-up verification over the course of the program year to ensure that all applicable data for verification is being collected and that bulbs are reaching customers.

**Recommendation 3.** Future similar programs should focus more closely on those ComEd customers that have limited exposure to energy efficiency products since that was the central goal of the One Change program.



**Recommendation 4.** ComEd should implement quality control on 5% of the participants soon after delivery (e.g., 1 month) to verify receipt of the CFLs or any other energy product delivered via a third party.

## 1. Introduction

### 1.1 Program Description

The One Change CFL Distribution Program is a third-party, community-based, CFL distribution program. The program delivers CFLs free of charge to those residential customers who were determined to be the least likely to respond to typical retail lighting offers. The program used a systems-based approach and focused targeting methodology to identify traditionally unresponsive neighborhoods. The customers were targeted based on previous energy efficiency program participation, age, and socioeconomic status. Between November 2013 and January 2014, 11 locally-hired One Change field representatives delivered 158,898 light bulbs to 26,730 ComEd customers. The One Change field representatives targeted specific neighborhoods which were of particular focus based upon prior limited involvement in ComEd energy efficiency programs. The bulbs were delivered in-person to those customers who answered the door. Those homes where no resident answered the door, CFLs were left at the residence's door step. Field representatives used an iPad with an application (iChange) that provided delivery lists, recorded the delivery address, and recorded answers to three questions (for those customers who were available in person) to assist in evaluation research. This mobile application was the One Change tracking system (iChange). There was ComEd marketing collateral included in the packet of CFL light bulbs.

### 1.2 Evaluation Objectives

The Evaluation Team identified the following key researchable questions for EPY6:

#### 1.2.1 Impact Questions

1. What are the verified gross annual energy and demand savings induced by the program?
2. What are the verified net impacts from the program?
3. Did the program meet its energy and demand savings goals?

#### 1.2.2 Process Questions

The evaluation team conducted a limited process evaluation for this program that mostly involved utility and implementer interviews, as well as several process questions asked as part of participant telephone surveys. Also, during the evaluation certain process-related issues became apparent and will be outlined below.

## 2. Evaluation Approach

The evaluation reflects the first program year of the One Change CFL Program (One Change) in the ComEd service territory. One Change will not continue operating as a ComEd program in PY7. For this impact evaluation the gross savings were evaluated by (1) reviewing the implementer submitted measure assumptions to assure that CFL savings are calculated in accordance with the Illinois TRM v2.0 (TRM) and (2) verifying light bulbs delivered based on review of the program Tracking System (iChange) and participant interviews. Navigant calculated net savings using the evaluator determined NTGR value of 0.60 based on a free-ridership rate of 40%. Navigant researched the NTGR value and that research is set forth in the appendix to this report. The evaluation team conducted a limited process review which included interviews with Program Implementer and ComEd staff. The evaluation also implemented a participant telephone survey to verify receipt and installation of the bulbs, which also asked several process questions.

### 2.1 Overview of Data Collection Activities

The core data collection activities included review of the program Tracking System, interviews with program staff, and a participant telephone survey. The full set of data collection activities and resources used in the course of the evaluation are outlined in Table 2-1 and Table 2-2.

The participant survey asked respondents to identify whether they remembered receiving the bulbs and if “yes”, how many bulbs did they install. Of the 22 participants who answered that they received the CFLs, 11 confirmed that they installed the bulbs and 10 reported being satisfied with the CFL light bulbs. Since only 22 respondents recalled getting the CFLs, we cannot make definitive statements on other questions from the participant survey. Navigant initially focused on the entire participant population (19,391 participants) and by the second evening of survey calls refined the telephone survey on the 2,398 participants that answered the four questions at the doorstep by field representatives.

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

What	Who	Target Completes	Completes Achieved	When
Program Tracking Database review	Participants	Census	Census	October - November 2014
In Depth Interviews	Program Manager/	1	1	November 2014
In Depth Interviews	Implementer Staff	1	1	November 2014
Telephone Survey	Participants	68	124	Fall 2014

**Table 2-2. Additional Resources**

Reference Source	Author	Application	Gross Impacts	Process
Illinois Technical Reference Manual Version 2.0, dated June 7, 2013	Illinois Energy Efficiency Stakeholder Advisory Group (SAG)	CFL Measure Impact Analysis	X	
Program Summary Report for EMV – Third Party Residential Energy Efficiency Program 2013/14 for ComEd Prepared by One Change and Sageview	One Change and Sageview	Impact and Process Analysis	X	X

## 2.2 Verified Savings Parameters

Verified gross and net Savings (energy and coincident peak demand) resulting from the PY6 Program were calculated using the following algorithm as defined by the Illinois TRM version 2.0<sup>3</sup>

$$\text{Verified Gross Annual kWh Savings} = \text{Program Bulbs} * ((\text{WattsBase} - \text{WattsEE}) / 1,000) * \text{ISR} * \text{Hours} * \text{WHFe}$$

Where:

- WattsBase = Based on lumens of CFL bulb and program year installed:
- WattsEE = Actual wattage of CFL purchased / installed
- ISR = In Service Rate, the percentage of units rebated that are actually in service.
- Hours = Average hours of use per year
- WHFe = Waste heat factor for energy to account for cooling energy savings from efficient lighting

$$\text{Verified Gross Annual kW Peak Coincident Demand Savings} = \text{Program Bulbs} * ((\text{WattsBase} - \text{WattsEE}) / 1,000) * \text{ISR} * \text{WHFd} * \text{CF}$$

With variables as described above and where:

- WHFd = Waste heat factor for demand to account for cooling energy savings from efficient lighting
- CF = Summer Peak Coincidence Factor for measure.

$$\text{Verified Gross Annual kW Savings} = \text{Program Bulbs} * ((\text{WattsBase} - \text{WattsEE}) / 1,000) * \text{ISR}$$

With variables as described above.

The following table presents the parameters that were used in the verified gross and net savings calculations and indicates which were examined through evaluation activities and which were deemed.

<sup>3</sup> Illinois TRM version 2.0 can be found at : <http://www.icc.illinois.gov/docket/files.aspx?no=13-0437&docid=200492>

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

Gross Savings Input Parameters	Data Source	Value	Deemed or Evaluated?
WattsBase	Illinois TRM v2.0 - Section 5.5.1	60	Deemed
WattsEE	Implementer	14	Actual
ISR	Illinois TRM v2.0 - Section 5.5.1	0.695	Deemed
Hours	Illinois TRM v2.0 - Section 5.5.1	1000	Deemed
WHFe	Illinois TRM v2.0 - Section 5.5.1	1.06	Deemed
WHFd	Illinois TRM v2.0 - Section 5.5.1	1.11	Deemed
CF	Illinois TRM v2.0 - Section 5.5.1	0.095	Deemed
NTG	Implementer	0.6	Evaluated

**2.2.1 Verified Gross Program Savings Analysis Approach**

Navigant calculated verified gross program impacts for CFLs using the deemed savings values from the Illinois TRM v2.0 (TRM).

**2.2.2 Verified Net Program Savings Analysis Approach**

Verified net energy and demand (*coincident peak and overall*) savings were calculated by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). In PY6, the NTGR estimates were calculated using the following formula:

$$Free\ Ridership = \left( Past\ Behavior\ Score * \frac{2}{3}, No\ Program\ Score * \frac{1}{3} \right)$$

$$NTG = 1 + Spillover - Free\ Ridership$$

**2.3 Process Evaluation**

The process evaluation for EPY6 was based on the in-depth interviews as mentioned above.

**2.3.1 Program Staff Interviews**

In-depth interviews were conducted with the ComEd program managers as well as with the implementation staff in November of 2014. These interviews discussed the household targeting, the program processes, and success of implementation.

### 3. Gross Impact Evaluation

In PY6, the One Change program achieved verified gross electric savings of 3,908,292 kWh with a realization rate of 70%. The program achieved verified peak coincident demand savings of 389 kW.

#### 3.1 Program Volumetric Findings

The evaluation team reviewed the Tracking System to verify number of bulbs distributed. The total bulbs were then multiplied by the CFL per unit savings, as deemed in the IL TRM v2.0, to determine the total verified gross savings. The evaluation team also conducted a telephone survey to verify delivery of the CFL light bulbs, the results of the survey are outlined in Table 3-1 and the overall disposition of the survey is outlined in Table 3-1. Results of Verification Survey Table 3-2 .

**Table 3-1. Results of Verification Survey**

Survey	Participants
Participation to reach Survey Statistical Goal of 90/10	68
Total Survey Participants	124
Participants who confirmed receipt of the CFLs (1 <sup>st</sup> Question)	22
Participants with no knowledge of receipt of the CFLs (1 <sup>st</sup> Question)	102
Participants confirmed installation of the CFLs	11
Participants satisfied with the CFLs	10

*Source: ComEd tracking data and Navigant team analysis.*

**Table 3-2. Survey Dispositions**

Survey Disposition	Number of Records
Loaded but not dialed	37
No answer	342
Answering machine	245
Busy signal	9
Disconnected phone	121
Business phone	4
Computer tone	2
Not Available	14
Respondent scheduled callback	3
Non-specific callback	1
Complete	22
Language problems	14
Initial/soft refusal	80
Hard refusal - DO NOT CALL	17
Customer said wrong number	10
Did NOT receive free bulbs/CFLs	84
Mid-interview terminate	1
<i>Total</i>	<i>1000</i>

Source: Participant Survey

Key findings include:

1. The reported total number of entries in the Tracking System was the same as the One Change Annual Report provided to ComEd.
2. The evaluation team found that 115,329 bulbs had the associated longitude and latitude entries in the Tracking System database that allowed the evaluation team to verify delivery of the bulbs (see section 5.2 for additional information on the Tracking System review).

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

Participation	Quantity
Total Bulbs Delivered, Claimed	158,904
Total Bulbs Delivered, Evaluated	115,329
Number of CFL 6-Packs Delivered, Evaluated	19,052
Number of CFL 3-Packs Delivered, Evaluated	339
Total Households	26,730

Source: ComEd tracking data and Navigant team analysis.

### 3.2 Gross Program Impact Parameter Estimates

As described in Section 2, energy and demand savings are estimated using deemed per-bulb savings values as specified in the TRM:

The unit savings and other gross savings parameters are shown in Table 3-4 below.

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

Gross Savings Input Parameters	Value	Deemed ‡ or Evaluated?
Quantity	115,329	Evaluated
Gross Savings per CFL(kWh)	33.9	Deemed
Gross Peak Demand Savings per CFL (kW)	0.003	Deemed
Gross Demand Savings per CFL (kW)	0.03	Evaluated
Verified Realization Rate on Ex-Ante Gross Savings (Lighting)	70%	Evaluated

‡ State of Illinois Technical Reference Manual version 2.0 from <http://www.ilsag.info/technical-reference-manual.html>.

### 3.3 Verified Gross Program Impact Results

The resulting total program verified gross savings is 3,908,292 kWh, gross peak demand savings of 389 kW, and total demand savings of 3,687 kW as shown in the following table (Table 3-5).

**Table 3-5. PY6 Verified Gross Impact Savings Estimates by Measure Type**

	Gross Energy Savings (kWh)	Gross Peak Demand Savings (kW)	Gross Demand Savings (kW)
Ex-Ante Gross Savings	5,546,070	NA	NA
Verified Gross Realization Rate	70%	NA	NA
Verified Gross Savings	3,908,292	389	3,687

Source: Evaluation Team analysis.

## 4. Net Impact Evaluation

The SAG consensus process determined that the NTG value should be calculated by the evaluation team and applied retrospectively to calculate verified net savings.<sup>4</sup> The evaluation team calculated a net to gross ratio based on collected survey questions outlined below. Additional information on how the net-to-gross ratio was calculated is available in the Appendix. Table 4-1 shows the NTG value and the PY6 verified net savings.

**Table 4-1. PY6 Verified Net Impact Savings Estimates**

	Energy Savings (kWh)	Coincident Peak Demand Savings (kW)	Demand Savings (kW)
Ex-Ante PY6 Gross Savings	5,546,070	NA	NA
Realization Rate	70%	NA	NA
Verified Gross Savings	3,908,292	389	3,687
Free Ridership	0.40	0.40	0.40
Spillover	0	0	0
NTG	0.60	0.60	0.60
Verified Net Savings	2,335,716	232	2,204

Source: Evaluation Team analysis.

One Change collected survey information from 2,398 customers during the light bulb distribution. The survey included the following questions around customer knowledge, CFL usage, and influence:

- Before I talked with you today, how familiar were you with CFLs? (0-10 scale)  
**Average response: 6.72**
- How many CFLs do you currently have installed in your home?  
**Average response: 4.78<sup>5</sup>**
- On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with the following statement "If I had not received the free CFLs from ComEd, I would have paid \$3 per bulb, so \$18 for the 6-pack of bulbs, to purchase the CFLs on my own."  
**Average response: 5.64**

<sup>4</sup> Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

<sup>5</sup> It is notable that nearly half of all respondents indicated that they had 4 or fewer bulbs which is far short of household saturation. Almost one-third reported 2 or fewer CFLs.

## 5. Process Evaluation

The section below includes information obtained from the in-depth program manager interviews as well as additional process findings related to the verification of results.

### 5.1 Program Verification

The evaluation team encountered difficulty in verifying the delivery of all the CFL light bulbs included in the Tracking System. Over one quarter (27.5%) of the records in the iChange Tracking System did not have latitude and longitude data entered – thus, there was no confirmation in iChange that the field staff had actually been to the participant’s home. Also, One Change staff delivered all of the CFLs during the day and when residents did not answer the door, One Change representatives left the CFLs on the door step.

To support the installation verification, the evaluation team implemented a telephone survey with program participants. Of 124 participants surveyed, 102 did not recall getting the program bulbs.

### 5.2 Tracking System

One Change’s Tracking System contains the following information:

- Customer ID: unique customer identifier as supplied by ComEd
- Customer Address
- Date Canvassed: date the bulbs were delivered
- Quantity: quantity of bulbs delivered (3 or 6)
- Response latitude and longitude: geo-tracking data which was entered at the door of participant by the field staff, using the GPS technology in the iPad
- Door latitude and longitude: the location of the applicable home based on mapping prior to the field staff arriving at the participant home
- Delta latitude and longitude: the difference between delivery location and door latitude and longitude (this verifies that the CFLs were delivered to the location)

The response latitude and longitude was to be used as verification that the bulbs were delivered to each participant. In the course of the evaluation team’s review of the Tracking System data, we noted that many of the response latitude and longitude entries were missing. Of the 26,730 entries in the Tracking System, 7,339 (or 27.5%) did not include the response latitude and longitude. Thus, 72.5% of the homes can be verified to have received the CFLs. This could be due to (1) the application malfunctioning, (2) a lack of cellular reception when distributing the bulbs, (3) the field staff noted, for a number of homes, it was too cold to enter the geo-tracking information at each individual address (light bulbs were distributed during November 2013 – January 2014), or (4) non-delivery.

Navigant recommends in future years that ComEd ensure that this or similar tracking systems are functioning and recording all necessary fields for verification during the course of the program year. If a wireless tracking system is not working or reliable, there should be a back-up form of verification provided to the field staff (e.g., paper spreadsheet to record entries in duplicate as deliveries are

executed). Navigant also recommends distributing the CFLs during more clement weather, which may lead to improved data as well as additional customer engagement. Finally, we recommend not leaving CFLs at doorsteps when residents do not answer the door since there is some likelihood that the CFLs will be taken and used by another not associated with the intended delivery residence.

### 5.2.1 Program Delivery

During the in-depth implementer program manager interview, the implementer noted their field staff would leave the CFL bulb pack at the door for those residents who did not answer the door. The bulbs were distributed during the daytime and, thus, the majority of the CFL bulb packs were left at the door without verbal identification of ComEd or the One Change program. The majority (102 out of 124) of those participants contacted via the telephone survey did not recall receiving the light bulbs. This could be due to (1) we did not speak with the person who received the bulbs, (2) some bulbs were left at the door, rather than being handed to a resident (those bulbs left at the door may not have made the same impression on the customer, (3) amount of time that had lapsed from receiving bulbs to the follow-up survey (approximately 10 months), (4) or [non-delivery of CFLs by the implementer may have led to participants' low recall receipt of the CFLs.](#)

The implementing contractor should be required to implement quality control on 5% of the participants soon after delivery (e.g., 1 month) to verify receipt of the CFLs or any other energy product delivered via a third party. Also, Navigant recommends in future years that ComEd conduct follow-up verification over the course of the program year (quality control on the implementer's results); either through telephone survey or by ensuring all applicable data is being collected properly in the implementer's Tracking System so there is verification as the year progresses.

## 5.3 Participant Feedback

Navigant fielded a simple telephone survey (*attached in the Appendix*) with the participants and completed the screening part of the survey with 124 participants. The participant survey asked respondents to identify whether they remembered receiving the bulbs and if "yes", how many bulbs did they install. Of the 22 participants who answered that they received the CFLs, 11 confirmed that they installed the bulbs and 10 reported being satisfied with the CFL light bulbs. The participants who did not report being satisfied noted the CFLs "could be a little bit brighter." Since only 22 respondents recalled getting the CFLs, we cannot make definitive statements on other questions from the participant survey. Navigant initially focused on the entire participant population and by the second evening of survey calls refined the telephone survey on the 2,398 participants that answered the four questions at the doorstep by field representatives.

The field staff asked three evaluation-provided questions when they spoke with customers at the door. We found answers from 2,398 participants in the data.

- Before I talked with you today, how familiar were you with CFLs? (0-10 scale)  
**Average response: 6.72**
- How many CFLs do you currently have installed in your home?  
**Average response: 4.78**

- On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with the following statement "If I had not received the free CFLs from ComEd, I would have paid \$3 per bulb, so \$18 for the 6-pack of bulbs, to purchase the CFLs on my own."  
**Average response: 5.64**

Using the field questions as a barometer of participants from the field, it is clear that residents had knowledge of CFLs, had nearly five CFLs installed in each home and were somewhat willing to pay \$3 per bulb regardless of the program. A recommendation for the future is to continue to focus such programs on those ComEd customers that have limited exposure to energy efficiency products. However placing these results in historical context we see that the average number of bulbs reported in the One Change PY6 population was roughly half that reported in the 2013 ComEd Residential Baseline Report(*ComEd Residential Saturation/End-Use Market Penetration and Behavioral Study*, April 2013). Given the effects of six years of ComEd programming and EISA this is a credible result for 2014.<sup>6</sup>

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<sup>6</sup> See e.g. Summit Blue et al, Commonwealth Edison Company Energy Efficiency/Demand Response Plan Year 1 (6/1/2008-5/31/2009) Evaluation Report: Residential Energy Star® Lighting December 10, 2009. Table 56, page 65 references the 2008 General Population Survey describing average bulb saturation in program participants of 9.7 and nonparticipants of 8.7. Available at: [http://ilsagfiles.org/SAG\\_files/Evaluation\\_Documents/ComEd/ComEd%20EPY1%20Evaluation%20Reports/ComEd\\_Res\\_Lighting\\_PY1\\_Evaluation\\_Report\\_Final.pdf](http://ilsagfiles.org/SAG_files/Evaluation_Documents/ComEd/ComEd%20EPY1%20Evaluation%20Reports/ComEd_Res_Lighting_PY1_Evaluation_Report_Final.pdf). Note too that nearly one-third reported 2 or fewer bulbs before receiving the bulb.

## 6. Findings and Recommendations

The following provides insight into key program findings and recommendations.<sup>7</sup> Overall, the program achieved net savings of 2,735,850, falling short of the program net goal of 3,874,902 kWh. A portion of the participants we spoke to via the telephone survey were satisfied with the CFL bulbs.

### Gross Impact Analysis

**Finding 1.** One Change achieved gross verified energy savings of 3,908,292 kWh, gross peak demand savings of 389 kW, and gross demand savings of 3,687 kW.

### Realization Rate

**Finding 2.** There was a difference between ex-ante and verified energy savings of 30%. This is due to (1) the ex-ante savings were calculated at the generator since the implementer used savings values based upon ComEd at the generator savings (savings at the generator are slightly higher, as compared to at the meter savings, since line losses have to be subtracted from the meter savings), and (2) the Tracking System and telephone survey did not provide adequate information to verify all bulbs delivered (the evaluation team verified 115,329 bulbs of the 158,904 claimed bulbs).

### Program Tracking Data

**Finding 3.** Of the 26,730 entries in the Tracking System (iChange), 7,339 (or 27.5%) entries did not have the latitude or longitude data (geo-tracking), which was part of the installation verification. The iChange tracking system failed in the field during delivery of the bulbs and much of the data was entered without any official geo-tracking stamp that could be verified by evaluation. Thus, the evaluation team could only verify 115,329 bulbs of the 158,904 claimed by the implementer.

**Recommendation 1.** Navigant recommends in future years that ComEd verify that this or similar tracking systems are functioning and recording all necessary fields for verification during the course of the program year. If a tracking system is wireless, there should be a back-up form of verification provided to the field staff (e.g., parallel (simple) spreadsheet or paper form). Navigant also recommends distributing the CFLs during more clement weather, which may lead to improved data as well as additional customer engagement.

### Program Delivery

**Finding 4.** Of the 124 customers contacted for the participant survey, 82% did not remember receiving the light bulb pack. This could be due to (1) we did not speak with the person who received the bulbs, (2) some bulbs were left at the door rather than being handed to a resident, (those bulbs left at the door may not have made the same impression on the customer), (3) amount of time that had lapsed from receiving bulbs to the follow-up survey (approximately 10 months), or (4) non-delivery of CFLs by the implementer may have led to participants' low recall receipt of the CFLs.

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<sup>7</sup> Numbered findings and recommendations in this section are the same as those found in the Findings and Recommendations section of the evaluation report for ease of reference between each section.

**Recommendation 2.** Navigant recommends that for similar programs, ComEd conduct follow-up verification during each month of such a program to ensure that all applicable data for verification is being collected and that bulbs are reaching customers.

**Recommendation 3.** Future similar programs should focus more closely on those ComEd customers that have limited exposure to energy efficiency products since that was the central goal of the One Change program.

**Recommendation 4.** The implementing contractor should be required to implement quality control on 5% of the participants soon after delivery (e.g., 1 month) to verify receipt of the CFLs or any other energy product delivered via a third party..

## 7. Appendix

### 7.1 Net to Gross Findings

Free Ridership was calculated using the survey responses collected by the One Change field representatives. The past behavior free ridership ratio is calculated using the number of CFLs participants currently have installed over a Bass Diffusion curve, with zero CFLs corresponding to a free ridership of 0%, an inflection point of 7 CFLs corresponding to free ridership of 50% and 9+ CFLs corresponding to a free ridership of 70%. This resulted in a total free ridership score of 32% (see Table 7-1).

**Table 7-1. Past Behavior Free Ridership Score**

Number of Bulbs Installed	Number of Participants	FR Percentage
0	354	0%
1-2	241	3%
2-4	360	15%
4-6	412	35%
6-8	192	55%
9+	506	70%

*Source: Participant survey*

In addition to number of CFLs already installed, to calculate free ridership the evaluation team also used a “no program” metric where the participants reported whether they would have purchased the CFLs had the program not been available. This resulted in a total free ridership score of 56% (see Table 7-2).

**Table 7-2. No Program Free Ridership Score**

No Program Score	Number of Participants	FR Percentage
0	242	0%
1	91	10%
2	140	20%
3	107	30%
4	104	40%
5	185	50%
6	61	60%
7	101	70%
8	156	80%
9	131	90%
10	436	100%
Don't know	272	50%

*Source: Participant survey*



The no program score was weighted at half of the past behavior score because past behavior is likely a better indicator of future behavior when compared to the no program score. *This resulted in a total FR of 40%.*

*The evaluation team did not find credible primary or secondary research for a spillover estimate, though given the program model and logic, spillover is likely very small or zero. Thus, the overall NTG for this program is 60%.*



## 7.2 Participant Survey

### ONE CHANGE RESIDENTIAL CFL PROGRAM – PARTICIPANT SURVEY

September 2014

#### Introduction

Hello, this is \_\_\_\_\_ from Opinion Dynamics calling on behalf of One Change CFL program. This is not a sales call. May I please speak with <PROGRAM CONTACT>?

Our records show that your home received <QTY> free light bulbs from the One Change energy efficiency light bulb program about 11 months ago <DATE> – the CFLs were hand-delivered to your home [confirm that they received]. This is a follow-up call to support evaluation efforts for this program. This survey should take about 2-5 minutes, is now a good time? [If no, schedule call back]

Q1. Did you receive CFL light bulbs delivered to your door sometime toward the end of last year (2013)?

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

Q2. Have you installed any of the <QTY> light bulbs?

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

[ASK IF Q2=1]

Q2a. How many did you install?

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
8. Don't know
9. Refused

[ASK IF Q2A=1-6]

Q2b. [IF Q2A2-6: Are they ALL] [IF Q2A=1: Is it] still installed?

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

[ASK IF Q2B=2]

Q2bb. Why did you remove these CFLs?

- Open end
98. Don't know
  99. Refused

[ASK IF Q2A=2-6 AND Q2B=2]

Q2c. How many of the CFLs are still currently installed?

0. None
1. 1
2. 2



- 3. 3
- 4. 4
- 5. 5
- 6. 6
- 8. Don't know
- 9. Refused

[CALCULATE QTY\_ORIGINALLY\_INSTALLED FROM Q2a]  
[CALCULATE QTY\_CURRENTLY\_INSTALLED FROM Q2A AND Q2B=Yes OR Q2C IF Q2B=No]

[ASK IF QTY\_ORIGINALLY\_INSTALLED>0, ELSE TO Q5]  
Thinking about the <QTY\_ORIGINALLY\_INSTALLED> CFLs you installed.  
Q3a. What type of light bulb did the first CFL replace?  
01. Incandescent  
02. Halogen  
03. CFL  
04. No light bulb (burned out)  
00. Other, please specify  
98. Don't know  
99. Refused

[ASK IF QTY\_ORIGINALLY\_INSTALLED >1]  
Q3a. What type of light bulb did the second CFL replace?  
01. Incandescent  
02. Halogen  
03. CFL  
04. No light bulb (burned out)  
00. Other, please specify  
98. Don't know  
99. Refused

[ASK IF QTY\_ORIGINALLY\_INSTALLED >2]  
Q3a. What type of light bulb did the third CFL replace?  
01. Incandescent  
02. Halogen  
03. CFL  
04. No light bulb (burned out)  
00. Other, please specify  
98. Don't know  
99. Refused

[ASK IF QTY\_ORIGINALLY\_INSTALLED >3]  
Q3a. What type of light bulb did the fourth CFL replace?  
01. Incandescent  
02. Halogen  
03. CFL  
04. No light bulb (burned out)  
00. Other, please specify  
98. Don't know  
99. Refused

[ASK IF QTY\_ORIGINALLY\_INSTALLED >4]  
Q3a. What type of light bulb did the fifth CFL replace?

- 01. Incandescent
- 02. Halogen
- 03. CFL
- 04. No light bulb (burned out)
- 00. Other, please specify
- 98. Don't know
- 99. Refused

[ASK IF QTY\_ORIGINALLY\_INSTALLED >5]

Q3a. What type of light bulb did the sixth CFL replace?

- 01. Incandescent
- 02. Halogen
- 03. CFL
- 04. No light bulb (burned out)
- 00. Other, please specify
- 98. Don't know
- 99. Refused

[ASK IF Q2A=1-6]

Q4. Were you satisfied with the quality of the CFL bulbs you installed?

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

[ASK IF Q4=2]

Q4b. Why were you not satisfied with the quality of the CFL bulbs you installed?

- Open end
- 98. Don't know
- 99. Refused

[ASK IF QTY > QTY\_ORIGINALLY\_INSTALLED]

Q5. Do you plan to install the light bulbs which you have not yet installed?

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

Those are all the questions I have. Thank you very much for your time and help, have a good day!