



# **Elementary Energy Education EPY6/GPY3 Evaluation Report**

**Draft**

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

**Presented to  
Commonwealth Edison Company  
Nicor Gas**

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## Executive Summary

This report presents a summary of Navigant Consulting Inc.’s (Navigant’s) findings and results from the Impact and Process Evaluation of the joint Commonwealth Edison Company (ComEd) Plan Year 6 and Nicor Gas Plan Year 3 (EPY6/GPY3)<sup>1</sup> Elementary Energy Education (EEE) program. The EEE program’s primary focus is to produce electricity and natural gas savings in the residential sector by motivating 5<sup>th</sup> grade students and their families to reduce energy consumption from water heating and lighting in their home. Additionally, the EEE program aims to increase participation in other ComEd and Nicor Gas programs via cross-marketing and increased customer awareness of energy efficiency issues. The program underwent several changes in EPY6/GPY3. The participation target, as defined in the Scope of Work, was 21,000 joint kits and was then increased to 26,000 joint kits. This increase in participation along with a significant waitlist of teachers wanting to participate in the program led to allowing certain 6<sup>th</sup> grade classrooms to participate in the program. Finally, the program included a second bathroom aerator in the take-home kit.

### E.1. Program Savings

Table E-1 summarizes the electricity savings from the EEE program. This program is offered to schools in a service territory served by Nicor Gas and an electricity delivery provider other than ComEd and to schools in a service territory served by both Nicor Gas and ComEd. Nicor Gas is the lead utility for this program and most of the energy savings are gas savings as opposed to electric savings. This report will only focus on electric savings achieved from kits delivered to schools in the service territory served by both utilities. Verified gross savings were calculated using the Illinois TRM Version 2.0<sup>2</sup> algorithms and parameters.

**Table E-1. EPY6/GPY3 Total Program Electric Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW)
Ex Ante Gross Savings <sup>3</sup>	4,172,174	NA <sup>4</sup>
Verified Gross Savings	4,162,033	483
Verified Net Savings	3,163,145	367

Source: Navigant analysis of ComEd tracking data.

### E.2. Program Savings by Measure Type

Table E-2 summarizes the electricity program savings by measure type.

<sup>1</sup> The EPY6/GPY3 program year began June 1, 2013 and ended May 31, 2014.

<sup>2</sup> State of Illinois Energy Efficiency Technical Reference Manual, effective June 1, 2013, which is to be found at <http://www.ilsag.info/technical-reference-manual.html>.

<sup>3</sup> From the NEF 2013 Think! Energy with Nicor Gas and ComEd Savings Report, named Nicor ComEd Report 2013.pdf

<sup>4</sup> Ex Ante gross kW were not included in the program tracking system.

**Table E-2. EPY6/GPY3 Electric Program Results by Measure**

Research Category	Ex Ante Gross Savings (kWh)	Ex-Ante Gross Demand Reduction (kW) <sup>5</sup>	Verified Gross Savings (kWh)	Verified Gross Demand Reduction (kW)	Verified Gross Realization Rate	NTGR*	Verified Net Savings (kWh)	Verified Net Demand Reduction (kW)
Showerheads	1,100,436	NA	1,085,887	70	99%	0.76	825,267	53
Kitchen Aerators	381,255	NA	374,621	76	98%	0.76	284,712	58
Bathroom Aerators	97,931	NA	106,294	96	109%	0.76	80,783	73
CFLs	2,592,552	NA	2,595,232	241	100%	0.76	1,972,376	183
Total	4,172,174	NA	4,162,033	483	99.8%	0.76	3,163,145	367

Source: Navigant analysis of ComEd tracking data.

\* A deemed value from the IL SAG consensus process "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>

### E.3. Impact Estimate Parameters for Future Use

In the course of our EPY6/GPY3 research, the evaluation team used a variety of parameters in its impact calculations. The evaluation team sourced the Illinois TRM Version 2.0 for all deemed parameters for gross savings algorithms and sourced the Home Energy Worksheets (HEW) for the following TRM-allowed custom parameters: installation rates, household size, number of showerheads per household, and CFL baseline wattage. The net-to-gross value for electric savings was deemed in this program year, based on the Illinois Stakeholder Advisory Group’s consensus process and from previous evaluation research. The gross realization rate was based on the evaluation research.

**Table E-3. Impact Estimate Parameters for Future Use**

Parameter	Value	Data Source
NTGR	0.76	Deemed*

\*A deemed value from the IL SAG consensus process "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>.

<sup>5</sup> Gross kW ex ante savings were not provided in the tracking system.

#### E.4. Program Volumetric Detail

The EEE program had 26,497 electric participants in EPY6/GPY3 as shown in the following table.

**Table E-4. EPY6/GPY3 Volumetric Findings Detail**

Volumetric Parameter	ComEd Total Participants or Measures Installed
Number of Total Kits Distributed	26,497
Number of Measures/Kit	7
Number of Total Measures Distributed	185,479

Source: Navigant analysis of ComEd tracking data.

#### E.5. Results Summary

The following table summarizes the key metrics from EPY6/GPY3.

**Table E-5. EPY6/GPY3 Results Summary**

Participation	Units	EPY6/GPY3
Verified Net Savings	kWh	3,163,145
Verified Net Demand Reduction	kW	367
Verified Gross Savings	kWh	4,162,033
Verified Gross Demand Reduction	kW	483
Program Realization Rate	%	99.8
Program NTG Ratio*	#	0.76
CFLs Distributed	#	79,491
Showerheads Distributed	#	26,497
Faucet Aerators Distributed	#	52,994
Kitchen Aerators Distributed	#	26,497
Total Kits Distributed	#	26,497

Source: Navigant analysis of ComEd tracking data.

\*A deemed value from the IL SAG consensus process "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>.

#### E.6. Key Findings and Recommendations

The following section provides insight into key program findings and recommendations.<sup>6</sup> Overall, the program performed well in EPY6/GPY3, exceeding energy savings and participation targets for the year.

<sup>6</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.

School teachers are pleased with the program: of the 295 schools enrolled in the program in EPY6/GPY3, 134 of them have previously participated.

#### **Program Participation**

**Finding 1.** The program distributed 26,497 kits to schools in ComEd service area, exceeding the original participation target of 20,000 joint kits, as well as the final participation target of 26,000 joint kits.

**Finding 2.** The return rate of the Home Energy Worksheets (HEW) was 67.1% or 17,783 worksheets returned out of 26,497.

#### **Verified Gross Program Savings and Realization Rate**

**Finding 3.** The EEE program achieved verified gross electric savings of 4,162,033 kWh and a gross savings realization rate of 99.8 percent. The program achieved verified gross demand savings of 483 kW.

#### **Tracking System Review**

**Finding 4.** The implementation contractor (NEF) provided algorithms and values for per unit savings for low-flow showerheads, CFLs, and kitchen and bathroom aerators in the final report, but the equations were not contained in the tracking system.

**Finding 5.** Navigant compared the tracking system values to what was reported in the final report and only found a small variation (2 kWh), which appeared to be due to rounding.

**Finding 6.** NEF did not calculate savings for single-family homes separately from multi-family homes; there is a distinction between water usage, waste heat factors, and savings for single-family homes and multi-family homes. This accounted for the small differences in the ex-ante savings and the verified gross savings.

**Recommendation 1.** The program should calculate savings for CFLs, aerators, and showerheads for single family homes separately from multi-family homes.

#### **Verified Net Savings.**

**Finding 7.** The program achieved verified net savings of 3,163,145 kWh, exceeding the net planning target of 1,900,000 kWh. The program achieved verified net demand savings of 367 kW.

#### **Process Evaluation**

**Finding 8.** The program is performing well, exceeding participation and savings goals. Comments about the program from parents and teachers are generally uniformly positive. Of the 700 teachers who responded to the educator evaluation questions asked by NEF, 80 percent of them said their impression of the program overall is excellent.

## 1. Introduction

### 1.1 Program Description

This report presents a summary of Navigant Consulting Inc.'s (Navigant's) findings and results from the Impact and Process Evaluation of the joint Commonwealth Edison Company (ComEd) Plan Year 6 and Nicor Gas Plan Year 3 (EPY6/GPY3)<sup>7</sup> Elementary Energy Education (EEE) program. The EEE program is implemented by National Energy Foundation (NEF) and is branded "THINK! ENERGY." In EPY6/GPY3, the program targeted fifth grade students in public and private schools that are customers of Nicor Gas or jointly Nicor Gas and ComEd. Schools received an invitation to participate and register to schedule the interactive presentations; alternatively, schools could register on the program website to join a waiting list if the program was fully-enrolled when they registered. Schools that had participated in the EPY5/GPY2 program were also invited to participate. New to EPY6/GPY3 was the participation of some sixth grade students due to smaller schools participating or schools with split classrooms. After the presentation, students took home a kit that includes water conservation measures; instruments to measure water and ambient temperature, as well as water flow rates, CFLs, and a home energy worksheet (HEW, or Scantron form) where participants used the form to report details of their family's participation. Students and teachers are incentivized to return the home energy worksheets with a \$100 mini-grant for each class that completes and returns 80 percent of their cards. Students are also incentivized to receive a program wristband if they complete and return a card. Teachers that returned 80 percent of the HEWs were entered into a raffle to win an iPad. NEF based the program's savings on the installation rate of implemented measures reported in the HEW against the number of kits that were reported taken home.

The EEE program's primary focus is to produce electricity and natural gas savings in the residential sector by motivating students and their families to take steps through reducing energy consumption for water heating and lighting in their home; a secondary goal of the program is to reduce residential use of water. Additionally, the EEE Program aims to increase participation in other ComEd and Nicor Gas programs via cross-marketing and increased customer awareness of energy efficiency issues.

### 1.2 Evaluation Objectives

The Evaluation Team identified the following key researchable questions for EPY6/GPY3:

#### 1.2.1 Impact Questions

1. What is the program's net and gross savings?
2. Did the program meet its energy and demand savings goals? If not, why not?

#### 1.2.2 Process Questions

1. Has the program changed since EPY5/GPY2? If so, why and how?

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<sup>7</sup> The EPY6/GPY3 program year began June 1, 2013 and ended May 31, 2014.

## 2. Evaluation Approach

This evaluation of the EEE Program reflects the fourth year of program operation for ComEd. For this impact evaluation, gross savings were evaluated by (1) reviewing the implementer submitted work papers to assure that savings are calculated correctly and in adherence with Illinois TRM v2.0 and (2) cross-checking totals with the tracking system. The evaluation team calculated verified net savings using a NTGR from previous evaluation research and approved through the Illinois Stakeholder Advisory Group (IL SAG) consensus process.<sup>8</sup> Navigant conducted a limited process review that included in-depth interviews with program staff.

### 2.1 Overview of Data Collection Activities

The core data collection activities included in depth interviews with program staff and review of the program tracking database. The full set of data collection activities is shown in the following tables.

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

What	Who	Target Completes	Completes Achieved	When	Comments
Program Tracking Database	Participants	All	All	September – October 2014	Source of information for verified gross analysis.
In Depth Interviews	Program Manager/Implementer Staff	3	3	March & August 2014	Included staff from Nicor Gas, ComEd, and NEF.

Source: Navigant

**Table 2-2. Additional Resources**

Reference Source	Author	Application	Impacts	Process
Illinois Technical Reference Manual Version 2.0	Illinois Energy Efficiency Stakeholder Advisory Group (SAG)	EEE Measure Impact Analysis	X	
Home Energy Worksheets	From National Energy Foundation	Impact Analysis	X	
NEF 2013 Think! Energy with Nicor Gas and ComEd Program Report	From National Energy Foundation	Impact Analysis Process Analysis	X	X

Source: Navigant

### 2.2 Verified Savings Parameters

In the course of estimating verified gross and net savings, the evaluation team used a variety of parameters in its calculations. Verified Gross and Net Savings (energy and coincident peak demand) resulting from the EPY6/GPY3 Program were calculated using the following algorithm.

$$\text{Total Registered Quantity} * \text{Unit Savings}$$

Unit Savings are calculated using the algorithms from the Illinois TRM v2.0 and Total Registered Quantity is the number of each type of measure distributed. The Illinois TRM deems most input

<sup>8</sup> Illinois Stakeholder Advisory Group, [ilsag.org/net](http://ilsag.org/net)

parameters for showerheads, faucet aerators, and CFLs (for detailed description of engineering algorithms and inputs used, see Section 3.3).

Table 2-3 lists the source of the measures that Navigant used. The Illinois TRM v2.0 allows for custom values to be used for household size, showerheads-per-household, faucets-per-household, and CFL baseline wattage, and Navigant based these values on HEW data. Navigant also calculated savings for single family homes separately from multi-family homes given the substantially different values for household size and showers per household.

**Table 2-3. Verified Gross Savings Parameters, Source of Deemed Inputs**

Measure	Deemed Input Parameter Source
Showerheads	Illinois TRM v2.0 - Section 5.4.5
Kitchen Aerators	Illinois TRM v2.0 - Section 5.4.4
Bathroom Aerators	
CFLs	Illinois TRM v2.0 - Section 5.5.1

*Source: Navigant*

### 2.2.1 Verified Gross Program Savings Analysis Approach

Navigant calculated verified gross program impacts for four measures with deemed savings values: low-flow showerheads, kitchen and bathroom faucet aerators, and CFLs. These measures account for all quantifiable EPY6/GPY3 electric savings.

### 2.2.2 Verified Net Program Savings Analysis Approach

Verified net energy and demand savings were calculated by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). In EPY6/GPY3, the NTGR estimates used to calculate the Net Verified Savings were based on past evaluation research and approved through the IL SAG consensus process.<sup>9</sup>

## 2.3 Process Evaluation

The process evaluation for EPY6/GPY3 was based on the in-depth interviews as mentioned above.

### 2.3.1 Program Staff Interviews

Navigant conducted interviews with the ComEd and Nicor Gas program managers as well as with the NEF implementation staff in the spring and summer of 2014. These interviews discussed the program’s energy savings and participation, as well as changes implemented in EPY6/GPY3 or planned for EPY7/GPY4.

<sup>9</sup> A deemed value from the IL SAG consensus process “ComEd PY5-PY6 Proposal Comparisons with SAG.xls,” available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>.

### 3. Gross Impact Evaluation

In EPY6/GPY3, the EEE program achieved verified gross electric savings of 4,162,033 kWh and a gross savings realization rate of 99.8 percent. The program achieved verified gross demand savings of 483 kW.

#### 3.1 Tracking System Review

NEF's tracking system for EPY6/GPY3 consisted of the following spreadsheets, (1) spreadsheet which contained the answers to the HEW and (2) spreadsheet which contained number of kits and measures distributed, including unit savings. The evaluation team also utilized the engineering work papers contained in the NEF 2013 Think! Energy with Nicor Gas and ComEd Program Report in order to confirm gross verified savings. The algorithms and inputs used to determine ex-ante savings were included in these work papers; however, it was unclear how some of inputs were calculated (mainly due to typos in the work papers). Navigant was able to arrive at all the necessary inputs used in the calculations in the work papers.

Key findings include:

1. The implementation contractor (NEF) provided algorithms and values for per unit savings for low-flow showerheads, CFLs, and kitchen and bathroom aerators in the work papers, but the equations were not contained in the program's tracking system.
2. Navigant compared the tracking system values to what was reported in the final report and only found a small variation (2 kWh), which appeared to be due to rounding.
3. NEF did not calculate savings for single-family homes separately from multi-family homes. There is a distinction between water usage and savings for single-family homes and multi-family homes, including differences in the waste heat factor. These differences accounted for the differences in ex-ante gross savings and verified gross savings.

#### 3.2 Program Volumetric Findings

The EEE program enrolled 26,497 participants in EPY6/GPY3, meeting the overall increased target of 26,000 participants set for this program year. Table 3-1 shows the number of measures distributed.

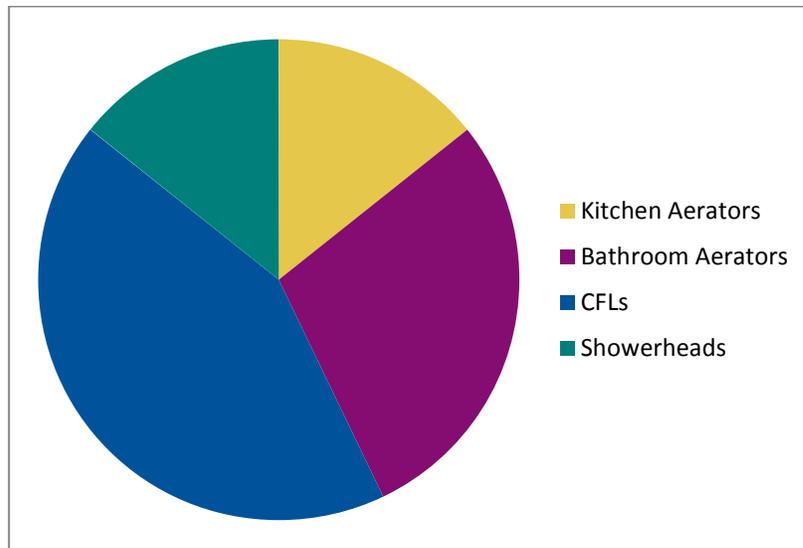
**Table 3-1. Program Volumetric Findings by Measure**

Volumetric Parameter	ComEd Total Participants or Measures Installed
Number of Total Kits Distributed	26,497
CFLs Distributed	79,491
Showerheads Distributed	26,497
Faucet Aerators Distributed	52,994
Kitchen Aerators Distributed	26,497
Number of Total Measures Distributed	185,479

Source: Navigant analysis of ComEd program tracking data.

Figure 3-1 below shows the distribution of the number of measures installed by type, respectively.

**Figure 3-1. Number of Measures Installed by Type**



Source: Navigant analysis of ComEd program tracking data.

### 3.3 Gross Program Impact Parameter Estimates

As described in Section 2, energy and demand savings were estimated using Illinois TRM v2.0. The Illinois TRM deems most input parameters for showerheads, faucet aerators and CFLs.

Navigant used the HEW data to calculate or adjust several input parameters, including showers per household, baseline wattage, and parameters dependent on bulb location (indoor or outdoor). The TRM provides location-dependent values for many parameters; because the evaluation team knew the distribution of interior and exterior lamps from the HEW data, we used the actual split of interior and exterior locations to determine operating hours and waste heat factors rather than using the “Unknown”

operating hours, which assume a certain percentage of exterior lamps. More detail is available in Table 3-2, Table 3-3, and Table 3-4.

The calculations for kWh and kW savings for showerheads are shown below and the data sources for the engineering inputs are outlined in Table 3-2:

$$\text{Verified Gross Annual kWh Savings} = \%ElectricDHW * ((GPM\_base * L\_base - GPM\_low * L\_low) * Household * SPCD * 365.25 / SPH) * EPG\_electric * ISR$$

Where:

<i>%ElectricDHW</i>	= proportion of water heating supplied by electric resistance heating
<i>GPM_base</i>	= Flow rate of the baseline showerhead
<i>GPM_low</i>	= As-used flow rate of the low-flow showerhead
<i>L_base</i>	= Shower length in minutes with baseline showerhead
<i>Household</i>	= Average number of people per household
<i>SPCD</i>	= Showers Per Capita Per Day
<i>365.25</i>	= Days per year, on average.
<i>SPH</i>	= Showerheads Per Household so that per-showerhead savings fractions can be determined
<i>EPG_electric</i>	= Energy per gallon of hot water supplied by electric
<i>ISR</i>	= In service rate of showerhead

$$\text{Verified Gross Annual kW Savings} = \text{Verified Gross Annual kWh Savings/Hours} * CF,$$

<i>Hours</i>	= Annual electric DHW recovery hours for showerhead use
<i>CF</i>	= Coincidence Factor for electric load reduction

**Table 3-2. Input Parameters and Data Sources, Showerheads**

Gross Savings Input Parameters	Data Source	Value, Single Family	Value, Multifamily	Unit	Deemed or Evaluated?
%ElectricDHW	TRM v2.0	0.15	0.26	%	Evaluated
GPM_base	TRM v2.0	2.35	2.35	GPM	Deemed
GPM_low	TRM v2.0	1.5	1.5	GPM	Deemed
L_base	TRM v2.0	8.2	8.2	min	Deemed
L_low	TRM v2.0	8.2	8.2	min	Deemed
Household	HEW	4.82	4.88	# people	Evaluated
SPCD	TRM v2.0	0.75	0.75	Showers/Day	Deemed
SPH	HEW	1.83	1.58	Showers/Household	Evaluated
EPG_electric	TRM v2.0	0.0054	0.0063	Therm/gal	Deemed
ISR	HEW	0.35	0.37	%	Evaluated
Hours	TRM v2.0	380	311	Hours	Deemed
CF	TRM v2.0	0.278	0.278	-	Deemed

Source: Navigant

The calculations for kWh and kW savings for aerators are shown below and the data sources for the engineering inputs are outlined in Table 3-3:

$$\text{Verified Gross Annual kWh Savings} = \%ElectricDHW * ((GPM\_base * L\_base - GPM\_low * L\_low) * Household * 365.25 * DF / FPH) * EPG\_electric * ISR$$

Where:

- %ElectricDHW* = proportion of water heating supplied by electric resistance heating
- GPM\_base* = Flow rate of the baseline aerator
- GPM\_low* = As-used flow rate of the low-flow aerator
- L\_low* = Average retrofit length faucet use per capita for all faucets in minutes
- L\_base* = Average baseline length faucet use per capita for all faucets in minutes
- Household* = Average number of people per household
- 365.25* = Days per year, on average.
- DF* = Drain Factor
- FPH* = Faucets Per Household
- EPG\_electric* = Energy per gallon of hot water supplied by electric
- ISR* = In service rate of aerator

$$\text{Verified Gross Annual kW Savings} = \text{Verified Gross Annual kWh Savings} / \text{Hours} * CF$$

Where:

- $\Delta kWh$  = calculated value above
- Hours = Annual electric DHW recovery hours for faucet use per faucet
- CF = Coincidence Factor for electric load reduction

**Table 3-3. Input Parameters and Data Sources, Aerators**

Gross Savings Input Parameters	Data Source	Value, Single Family, Kitchen	Value, Multifamily, Kitchen	Value, Single Family, Bathroom	Value, Multifamily, Bathroom	Unit	Deemed or Evaluated?
%ElectricDHW	HEW	0.15	0.26	0.15	0.26	%	Evaluated
GPM_base	TRM v2.0	1.2	1.2	1.2	1.2	GPM	Deemed
GPM_low	TRM v2.0	0.94	0.94	0.94	0.94	GPM	Deemed
L_base	TRM v2.0	6.9	6.9	2.95	2.95	Min/person/day	Deemed
L_low	TRM v2.0	6.9	6.9	2.95	2.95	Min/person/day	Deemed
Household	HEW	4.82	4.88	4.82	4.88	# people	Evaluated
DF	TRM v2.0	0.75	0.75	0.90	0.90	%	Deemed
FPH	TRM v2.0	1	1	2.83	1.5	#	Deemed
EPG_electric	TRM v2.0	0.0894	0.0894	0.0894	0.0894	%	Deemed
ISR	HEW	0.38	0.43	0.37, 0.22	0.41, 0.22	%	Evaluated
Hours	TRM v2.0	115	94	21	32	Hours	Deemed
CF	TRM v2.0	0.022	0.022	0.022	0.022	%	Deemed

Source: Navigant

The calculations for kWh and kW savings for CFLs are shown below and the data sources for the engineering inputs are outlined in Table 3-4:

$$\text{Verified Gross Annual kWh Savings} = ((\text{WattsBase} - \text{WattsEE}) / 1000) * \text{ISR} * \text{Hours} * \text{WHFe}$$

Where:

- WattsBase = Baseline wattage, 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

$$\text{Verified Gross Annual kW Savings} = ((\text{WattsBase} - \text{WattsEE}) / 1000) * \text{ISR} * \text{WHFd} * \text{CF}$$

Where:

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

**Table 3-4. Input Parameters and Data Sources, CFLs**

Gross Savings Input Parameters	Value, SF	Value, MF	Value, Outdoor	Data Source	Deemed † or Evaluated?
WattsBase	Actual	Actual	Actual	HEW	Evaluated (Actual)
WattsEE	14	14	14	TRM v2.0	Deemed (Actual)
WHFe	1.06	1.04	1.00	TRM v2.0	Deemed
WHFd	1.11	1.07	1	TRM v2.0	Deemed
CF	0.095	0.095	0	TRM v2.0	Deemed
ISR	0.695	0.695	0.695	TRM v2.0	Deemed
Hours	938	938	1825	TRM v2.0	Deemed

Source: Navigant

### 3.4 Verified Gross Program Impact Results

The EEE program achieved verified gross electric savings of 4,162,033 kWh and a gross savings realization rate of 99.8 percent. The program achieved verified gross demand savings of 483 kW. The table below presents program savings at the measure group level.

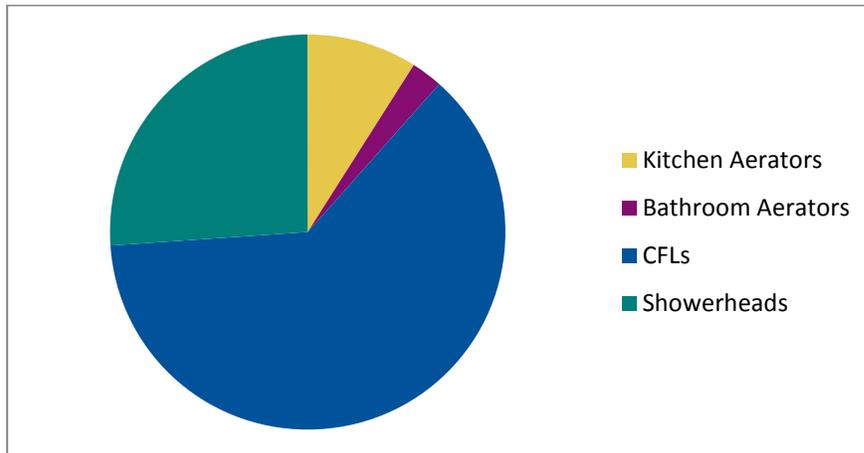
**Table 3-5. EPY6/GPY3 Verified Gross Impact Savings Estimates by Measure Type**

	Energy Savings (kWh)	Coincident Peak Demand Savings (kW)
<b>Lighting Measures</b>		
Ex-Ante Gross Savings	2,592,552	N/A
Verified Gross Realization Rate	100%	N/A
Verified Gross Savings	2,595,232	241
<b>Non-Lighting Measures</b>		
Ex-Ante Gross Savings	1,579,622	N/A
Verified Gross Realization Rate	99%	N/A
Verified Gross Savings	1,566,801	242
<b>Total</b>		
Ex-Ante Gross Savings	4,172,174	N/A
Verified Gross Realization Rate	99.8%	N/A
Verified Gross Savings	4,162,033	483

Source: Navigant analysis of ComEd program tracking data.

Figure 3-2 below shows the relative distribution of gross energy savings by measure.

**Figure 3-2. Verified Gross Savings by Measure**



Source: Navigant analysis of ComEd program tracking data.

## 4. Net Impact Evaluation

The program achieved verified net savings of 3,163,145 kWh and verified net demand savings of 367 kW. The evaluation team calculated verified net savings using a NTGR from previous evaluation research and approved through the Illinois Stakeholder Advisory Group (IL SAG) consensus process.<sup>10</sup> The table below shows the deemed NTG values and the EPY6/GPY3 verified net savings.

**Table 4-1. EPY6/GPY3 Verified Net Impact Savings Estimates by Measure Type**

	Energy Savings (kWh)	Coincident Peak Demand Savings (kW)
<b>Lighting Measures</b>		
Verified Gross Savings	2,595,232	241
NTG	0.76	0.76
Verified Net Savings	1,972,376	183
<b>Non-Lighting Measures</b>		
Verified Gross Savings	1,566,801	242
NTG	0.76	0.76
Verified Net Savings	1,190,769	184
<b>Total</b>		
Verified Gross Savings	4,162,033	483
NTG	0.76	0.76
Verified Net Savings	3,163,145	367

Source: Navigant analysis of ComEd program tracking data.

<sup>10</sup> "ComEd PY5-PY6 Proposal Comparisons with SAG.xls," available on the IL SAG website here: <http://ilsag.info/net-to-gross-framework.html>.

## 5. Process Evaluation

This section includes changes made to the EEE program in EPY6/GPY3 as well as changes planned for EPY7/GPY4.

### 5.1 Program Changes since EPY5/GPY2

The EPY6/GPY3 program has changed in several ways since EPY5/GPY2 as described below. Together these changes amount to increased savings per kit, per participant, as well as for the program.

#### 5.1.1 Participation

One of the major changes in EPY6/GPY3 was the increase in the target number of program participants. Originally, the target for EPY6/GPY3 was 21,000 joint kits but was then increased to 26,000 joint kits. The program met the target number in EPY6/GPY3. Some sixth grade classrooms were allowed to participate because of the increased target number and in cases where fifth and sixth grade students were in the same classroom to learn about energy education.

#### 5.1.2 Measures in Kits

There were no changes made to the make and model of the measures included the kits but a second bathroom aerator was added in EPY6/GPY3. Natural gas savings for the water heater setback were also counted this year (for the first time) due to the enhanced questions on the HEWs. Rather than only asking the parent if they set back the temperature on their water heater, an illustration was included that shows examples of water heater dials with notches ranging from “vacation” to “very hot”. Additional questions were included asking about old settings and new settings for the water heater dials.

### 5.2 Participant Feedback

According to participants, this program is performing well. The program’s increased participation targets were met, which suggests strong interest in the program. Of the overall 295 schools that participated in EPY6/GPY3, 134 of them have participated in the program before. Around 700 teachers responded to the educator evaluation questions asked by NEF, and about 80 percent of respondents said their impression of this program overall was excellent. Around 460 parents responded to the parent evaluation questions asked by NEF, and more than 94 percent said the kit devices were easy to install and use. About 97 percent of parents surveyed said they would continue to use the kit items after the program ended, and about 96 percent of parents surveyed said they would like to see this program continue in their schools.

### 5.3 Planned Changes for EPY7/GPY4

ComEd and Nicor Gas have changes planned for the EPY7/GPY4 program as discussed below.

#### 5.3.1 New Implementation Contractor

One of the major changes planned for EPY7/GPY4 is the use of a new implementation contractor. This was due to ComEd’s perceived shortcomings with the current program procedures.

### **5.3.2 Participation**

Another change in EPY7/GPY4 is the addition of Peoples Gas and North Shore Gas to the program. ComEd will be partnering with Nicor Gas as well as Peoples Gas and North Shore Gas. Even with the addition of these two utilities, the participation target is scaled back to about 15,000 kits distributed in total in EPY7/GPY4.

## 6. Findings and Recommendations

This section includes program findings and recommendations.<sup>11</sup> Overall, the program performed well in EPY6/GPY3, exceeding energy savings and participations. Schools are pleased with the program: Of the 295 schools enrolled in the program in EPY6/GPY3, 134 of them have participated before.

### Program Participation

**Finding 1.** The program distributed 26,497 kits to schools in ComEd service area, exceeding the original participation target of 21,000 joint kits as well as the final participation target of 26,000 joint kits.

**Finding 2.** The return rate of the Home Energy Worksheets (HEW) was 67.1% or 17,783 worksheets returned out of 26,497.

### Verified Gross Program Savings and Realization Rate

**Finding 3.** The EEE program achieved verified gross electric savings of 4,162,033 kWh and a gross savings realization rate of 99.8 percent. The program achieved verified gross demand savings of 483 kW.

### Tracking System Review

**Finding 4.** The implementation contractor (NEF) provided algorithms and values for per unit savings for low-flow showerheads, CFLs, and kitchen and bathroom aerators in the final report, but the equations were not contained in the tracking system.

**Finding 5.** Navigant compared the tracking system values to what was reported in the final report and only found a small variation (2 kWh), which appeared to be due to rounding.

**Finding 6.** NEF did not calculate savings for single-family homes separately from multi-family homes; there is a distinction between water usage, waste heat factors, and savings for single-family homes and multi-family homes. This accounted for the small differences in the ex-ante savings and the verified gross savings.

**Recommendation 1.** The program should calculate savings for CFLs, aerators, and showerheads for single family homes separately from multi-family homes.

### Verified Net Savings.

**Finding 7.** The program achieved verified net savings of 3,163,145 kWh, exceeding the net planning target of 1,900,000 kWh. The program achieved verified net demand savings of 367 kW.

### Process Evaluation

**Finding 8.** The program is performing well, exceeding participation and savings goals. Comments about the program from parents and teachers are generally uniformly positive. Of

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<sup>11</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.



the 700 teachers who responded to the educator evaluation questions asked by NEF, 80 percent said their impression of the program overall is excellent.