

ComEd

Home Energy Assessment Evaluation Report

DRAFT
Energy Efficiency / Demand Response Plan:
Plan Year 8 (PY8)
(6/1/2015-5/31/2016)

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Commonwealth Edison Company

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TABLE OF CONTENTS

- E. Executive Summary 3**
 - E.1. Program Savings 3
 - E.2. Program Savings by Joint Utility Program and Measure..... 3
 - E.2.1 ComEd and Peoples Gas & North Shore Gas Territories 4
 - E.2.2 ComEd and Nicor Gas Territory..... 4
 - E.3. Program Volumetric Detail..... 4
 - E.4. Results Summary 5
 - E.5. Findings and Recommendations 6
- 1. Introduction..... 9**
 - 1.1 Program Description..... 9
 - 1.2 Evaluation Objectives..... 9
 - 1.2.1 Impact Questions..... 9
 - 1.2.2 Process Questions..... 9
- 2. Evaluation Approach 10**
 - 2.1 Overview of Data Collection Activities 10
 - 2.2 Verified Savings Parameters 10
 - 2.2.1 CFL and LED Replacement..... 10
 - 2.2.2 Low Flow Faucet Aerators 11
 - 2.2.3 Low Flow Showerheads..... 11
 - 2.2.4 Smart Strips..... 11
 - 2.2.5 Programmable Thermostats 11
 - 2.2.6 Water Heater Pipe Insulation..... 12
 - 2.2.7 Deemed Values 12
 - 2.2.8 Smart Thermostats 14
 - 2.2.9 Verified Net Program Savings Analysis Approach..... 14
 - 2.3 Process Evaluation..... 15
- 3. Gross Impact Evaluation 16**
 - 3.1 Tracking System Review 16
 - 3.2 Program Volumetric Findings 17
 - 3.3 Gross Program Impact Parameter Estimates 21
 - 3.4 Verified Gross Program Impact Results 21
- 4. Net Impact Evaluation..... 23**
- 5. Process Evaluation 25**
 - 5.1 Co-Pay Measures Literature Review..... 25
 - 5.2 Program Changes since PY7 25
 - 5.2.1 Energy Savings Targets 25
 - 5.2.2 Measures Offered..... 25
 - 5.2.3 Energy Advisor Teams 26
 - 5.3 Marketing and Outreach..... 26
 - 5.4 Participant Feedback..... 26
 - 5.5 Program Changes in PY9..... 27
- 6. Findings and Recommendations 28**
- 7. Appendix 30**
 - 7.1 Gross Savings Analysis..... 30

7.1.1 ComEd and PG/NSG Territories Data from Franklin Energy 30
 7.1.2 ComEd and Nicor Gas Territory Data from CLEAResult 40
 7.2 Volumetric Anomalies..... 41

LIST OF TABLES AND FIGURES

Figures

Figure 3-1. Number of Measures Installed by Type20
 Figure 3-2. Verified Gross MWh Energy Savings by Measure Type20
 Figure 3-3. Verified Gross Peak Demand Savings by Measure Type21

Tables

Table E-1. PY8 Total Program Electric Savings..... 3
 Table E-2. PY8 Program Results by Measure – ComEd and Peoples Gas & North Shore Gas Territories4
 Table E-3. PY8 Program Results by Measure – ComEd and Nicor Gas Territory4
 Table E-4. PY8 Volumetric Findings Detail5
 Table E-5. PY8 Results Summary6

Table 2-1. Primary Data Collection Activities 10
 Table 2-2. Additional Resources10
 Table 2-3. TRM Deemed Savings Input Parameters Used in Ex Post Analysis..... 13
 Table 2-4. Deemed Savings Input Parameters and Sources14
 Table 2-5. Smart Thermostat Deemed Savings by Baseline Type.....14
 Table 2-6. Net to Gross Ratios by Measure Type15
 Table 3-1. Home Types and Treatments.....17
 Table 3-2. PY8 Volumetric Findings Detail.....18
 Table 3-3. PY8 Volumetric Measures Installed by Program and Measure Type19
 Table 3-4. Measure Savings Algorithm Sources21
 Table 3-5. PY8 Verified Gross Impact Savings Estimates by Measure Type.....22
 Table 4-1. PY8 Verified Gross and Net Impact Savings Estimates by Measure Type24
 Table 5-1. Measures Offered in the HEA Program26
 Table 7-1. Franklin Energy’s Project, Measure Counts, and Savings by Measure..... 31
 Table 7-2. Franklin Energy’s Average Savings per Measure by Measure34
 Table 7-3. Franklin Energy’s Project, Measure, and Savings Counts by Aggregated Measure38
 Table 7-4. CLEAResult’s Project, Measure Counts, and Savings by Measure40
 Table 7-5. CLEAResult’s Average Savings per Measure by Measure41
 Table 7-6. Projects Which Did Not Receive an Assessment.....42
 Table 7-7. Smart Thermostat Quantity Anomalies45
 Table 7-8. Single-Family Homes Claiming Multiple Programmable Thermostats51

E. EXECUTIVE SUMMARY

This report presents a summary of the findings and results from the impact and process evaluations of the PY8¹ Home Energy Assessment (HEA) program. The HEA program is an assessment and direct install program jointly implemented by Commonwealth Edison Company (ComEd) and Peoples Gas and North Shore Gas (PG/NSG) with Franklin Energy Services implementing the program in the PG/NSG territory. The program is also jointly implemented by ComEd and Nicor Gas with CLEAResult implementing the program in the Nicor Gas territory. This report focuses solely on the electric savings from the program. Savings from natural gas measures are included in separate evaluation reports. The primary objective of this residential direct install program was to secure energy savings through direct installation of low-cost efficiency measures, such as: water efficient showerheads and faucet aerators, pipe insulation, programmable thermostats, and compact florescent lamps (CFLs) at eligible single family residences. New to the program in PY8 was the introduction of direct install outdoor LEDs, co-pay indoor LEDs, co-pay smart thermostats and power strips. Measures with verified electric savings were CFLs, LEDs, programmable thermostats, smart thermostats, smart strips and hot water heating savings (when the hot water was electrically heated). The secondary objective of this program was to function as the “gateway” for homeowners to participate in other residential programs. HEA performs a brief assessment of the major retrofit opportunities (e.g., furnace, boiler, air conditioning, insulation, and air sealing) and brings heightened awareness to the homeowners about available additional efficiency programs offered by ComEd, Peoples Gas, North Shore Gas, and Nicor Gas.

E.1. Program Savings

Table E-1 summarizes the electricity savings from the HEA program.

The combined electricity savings from both joint programs is shown in Table E-1 and includes verified net energy savings of 7,316 MWh, verified net demand reduction of 6.745 MW, and verified net peak demand reduction of 0.7464 MW. These savings values include the program savings from both implementers: Franklin Energy and CLEAResult in the Peoples Gas/North Shore Gas and Nicor Gas territories, respectively.

Table E-1. PY8 Total Program Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)*	Peak Demand Savings (MW)†
Ex Ante Gross Savings	9,120	Not Tracked	0.8882
Verified Gross Savings	8,875	8.408	0.9140
Verified Net Savings	7,316	6.745	0.7464

Source: ComEd tracking data and Navigant team analysis.

†The ComEd/PG/NSG program claimed ex ante peak demand savings for CFLs, LEDs, hot water measures, and smart strips. They did not claim peak demand savings for programmable thermostats. In addition, the ComEd/PG/NSG program did not claim ex ante overall demand savings for any measures. The ComEd/Nicor Gas program claimed ex ante peak demand savings for all measures, including programmable thermostats being applied to a few homes with air conditioning, however did not claim ex ante overall demand savings for any measures.

E.2. Program Savings by Joint Utility Program and Measure

Table E-2 shows the ex ante and Navigant’s verified ex post savings for the portion of the HEA program implemented in ComEd’s and PG/NSG’s territories. Table E-3 shows the ex ante and Navigant’s verified ex post savings for the portion of the HEA program implemented in ComEd’s and Nicor Gas’ territory.

¹ The PY8 program year began June 1, 2015 and ended May 31, 2016.

E.2.1 ComEd and Peoples Gas & North Shore Gas Territories

Table E-2. PY8 Program Results by Measure – ComEd and Peoples Gas & North Shore Gas Territories

Research Category	Ex Ante Gross Savings (MWh)	Ex-Ante Gross Demand Reduction (MW)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate	NTGR†	Verified Net Savings (MWh)	Verified Net Peak Demand Reduction (MW)
CFL Measures	3,309.2	0.3339	3,311.4	0.3428	100%	0.80	2,649.2	0.2743
LED Measures	1,852.5	0.1846	1,637.6	0.1954	88%	0.80	1,310.1	0.1563
Hot Water Measures	70.0	0.0118	72.7	0.0125	104%	0.80	58.1	0.0100
Programmable Thermostat Measures	309.4	0.0000	287.2	0.0000	93%	0.90	258.4	0.0000
Smart Thermostat Measures	136.8	0.0000	134.8	0.0000	99%	1.00	134.8	0.0000
Smart Strip	750.8	0.0825	750.8	0.0838	100%	0.95	713.2	0.0796
Total	6,428.7	0.6128	6,194.5	0.6346	96%		5,123.9	0.5202

Source: ComEd tracking data and Navigant team analysis.

† Source: ComEd_NTG_History_and_PY8_Recommendation_2016-02-26_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

E.2.2 ComEd and Nicor Gas Territory

Table E-3. PY8 Program Results by Measure – ComEd and Nicor Gas Territory

Research Category	Ex Ante Gross Savings (MWh)	Ex-Ante Gross Demand Reduction (MW)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate	NTGR†	Verified Net Savings (MWh)	Verified Net Peak Demand Reduction (MW)
CFL Measures	1,106.6	0.1146	1,106.6	0.1174	100%	0.80	885.3	0.0939
LED Measures	1,120.1	0.1216	1,118.0	0.1225	100%	0.80	894.4	0.0980
Hot Water Measures	127.5	0.0221	128.2	0.0222	100%	0.80	102.6	0.0177
Programmable Thermostat Measures	108.8	0.0000	106.1	0.0000	98%	0.90	95.5	0.0000
Smart Thermostat Measures	73.3	<0.0001	67.0	0.0001	91%	1.00	67.0	0.0001
Smart Strip	154.8	0.0169	154.8	0.0173	100%	0.95	147.1	0.0164
Total	2,691.1	0.2754	2,680.7	0.2794	100%		2,191.8	0.2262

Source: ComEd tracking data and Navigant team analysis.

† Source: ComEd_NTG_History_and_PY8_Recommendation_2016-02-26_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

E.3. Program Volumetric Detail

In PY8, the program performed 17,127 assessments, included 17,138 unique projects, and distributed 239,961 measures as shown in the following table. There were 86 project IDs that were not associated with an assessment. These 86 projects are identified in Table 7-664 in Appendix Section 7.2. There are two associated reasons for the discrepancy: the software package used by implementers to track measures and savings does not allow retroactive editing or additions to existing Project IDs. Therefore, if an implementer would like to add measures to complete a project’s data entry at a later time and date, they must create an additional Project ID associated with the site. Additionally, if an implementer is called back to a site to install additional direct install measures at a later date, a new Project ID must be added, but a new assessment is not done. Both of these situations result in multiple Project IDs, but only one assessment associated with a single site. This issue is discussed in Finding 10 and Recommendations 6.

Table E-4. PY8 Volumetric Findings Detail

Participation	Franklin Energy in PG/NSG Territory	CLEAR Result in Nicor Gas Territory	Program Overall
Unique Projects [§]	12,242	4,896	17,138
Assessments (Jumpstart Site Visit) [§]	12,233	4,894	17,127
Total Measures	175,104	64,857	239,961
Number of Units/Project	14.2	13.2	13.9
Direct Install Measures (non-CFLs or LEDs)	14,165	4,267	18,432
CFL Installations	131,073	46,695	177,768
LED Installations	29,866	13,895	43,761
Showerheads	164	298	462
Kitchen Faucet Aerators	52	121	173
Bathroom Faucet Aerators	148	280	428
Pipe Insulation	300	401	701
Programmable Thermostats	3,332	684	4,016
Reprogramming Thermostats	1,980	515	2,495
Smart Thermostats	900	465	1,365
Smart Strips	7,289	1,503	8,792

Source: ComEd tracking data and Navigant team analysis.

[§]The quantity of "Unique Projects" represents the amount of unique project numbers (or IDs), per the program tracking databases. There were 86 Project IDs that were not associated with an assessment. These projects are detailed in the Appendix 7.2. There are two associated reasons for the discrepancy: the software package used by the implementers to track measures and savings does not allow retroactive editing or additions to existing Project IDs. Therefore, if an implementer would like to add measures to complete a project's data entry, the implementer must create an additional Project ID associated with the home. Additionally, if an implementer is called back to a home to install additional measures, a new Project ID must be added to the tracking system, but a new assessment is not done. Both of these situations result in multiple Project IDs, but only one assessment per home. This issue is discussed in Finding 10 and Recommendation 6.

E.4. Results Summary

The following table summarizes the key metrics from PY8.

Table E-5. PY8 Results Summary

Participation	Units	PY8
Net Savings	MWh	7,316
Net Peak Demand Reduction	MW	0.7464
Gross Savings	MWh	8,875
Gross Peak Demand Reduction	MW	0.9140
Program Energy Realization Rate	%	97%
Program NTG Ratio	#	†
Unique Projects	#	17,138
Measures Installed	#	239,961

Source: ComEd tracking data and Navigant team analysis.

† Most measures have a deemed value which varies by measure type: 0.80 for CFL, LED, and hot water measures; 0.90 for programmable thermostat measures, and 0.95 for smart strip measures. Source: ComEd_NTG_History_and_PY8_Recommendation_2016-02-26_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>. For smart thermostats measures, the NTGR is 1.00 since savings is based on savings outlined in Navigant’s Smart Thermostat Memo². The savings in that memo are based on regression analysis of energy consumption data. As a result, the savings from that approach are properly interpreted as net savings, not adjusted gross.

E.5. Findings and Recommendations

The following provides insight into key program findings and recommendations.³ The program performed well in PY8, exceeding energy savings and participation targets for the year with high marks for customer satisfaction.

Program Participation

Finding 1. The program reached over 17,000 homes in the ComEd service area, exceeding the original participation target of 15,000 homes.

Program Savings

Finding 2. Overall, the HEA program achieved verified gross savings of 8,875 MWh with a corresponding verified gross realization rate of 97 percent for energy savings. For the ComEd/PG/NSG program, the verified gross savings were 6,194 MWh. For the ComEd/Nicor Gas program, the verified gross savings were 2,681 MWh.

Finding 3. Overall, the program achieved 117 percent of its planning target of 6,260 net MWh with verified net savings of 7,316 MWh.

Finding 4. Overall, the verified net peak demand reduction was 0.746 MW and the verified total net demand reduction was 6.75 MW.

² Illinois Smart Thermostat Electric Impact Findings Memo, March 1, 2016. Navigant.

³ 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.

Process Evaluation

Finding 5. The program is performing well. Participation and energy savings targets were exceeded this year. Comments about the program from participants are generally uniformly positive with a satisfaction rating of 4.9 out of 5.⁴

Impact Analysis

Finding 6. The implementers included identifiers for home type in the measure description in the tracking database. The implementers applied single-family input parameters to all home types. Navigant used the available data to apply multi-family input parameters when appropriate. A summary of ex ante and ex post assumptions for single and multi-family homes are presented in Table 3-13-1 in Section 3.

Recommendation 1. Multi-family homes should use input parameters per the Illinois TRM specific to multi-family homes, resulting in slightly different savings values when appropriate. For future program years, seek agreement early in the program year between Navigant and the implementation contractor(s) regarding definition of single-family and multifamily configuration savings calculations' inputs.

Finding 7. Some multifamily style condominium homes were assigned the inappropriate "Single Family" building types (see 201 Decatur Ave). As discussed in Finding 6 and Recommendation 1 above, multi-family and single family building types receive different savings values due to shared walls, ceilings, floors, HVAC systems, and/or other differences.

Recommendation 2. Identify clear criteria distinguishing single family and multi-family type homes, and reiterate the importance of accurately identifying home type with implementation contractors.

Finding 8. Some homes received more than one programmable thermostat or smart "advanced" thermostat. The implementers credited savings for each installed (or reprogrammed) thermostat, but the TRM states "Energy savings are applicable at the household level; all thermostats controlling household heat should be programmable and installation of multiple programmable thermostats per home does not accrue additional savings."⁵ Navigant limited savings to those of a single measure per home. As stated in Table 3-13-1, this allowed duplexes to have two measures; triplexes, three, etc.

Recommendation 3. Per the TRM, for programmable and smart thermostats measures, cap household savings at one unit per household.

Recommendation 4. Include baseline thermostat types in the tracking data.

Finding 9. The Illinois TRM specifies separate hours-of-use (HOU) values for CFL and LED bulbs installed in similar locations. The implementer applied the same HOU to both CFL and LED measures. Navigant updated the HOU assumptions based on CFL and LED measure types.

Recommendation 5. Use the appropriate HOU values for CFL and LED measures, per the Illinois TRM.

Finding 10. Some homes are associated with more than one Project ID. There were 86 Project IDs that were not associated with an assessment. These projects are detailed in the Appendix 7.2. There are two associated reasons for the discrepancy: the software package used by implementers to track measures and savings does not allow retroactive editing or additions to existing Project IDs. Therefore, if an implementer would like to add measures to complete a project's data entry, they must create an additional Project ID associated with the home. Additionally, if an implementer is called back to a home to install additional measures, a new Project ID must be added, but a new assessment is not done. Both of these situations result in multiple Project IDs, but only one assessment associated with a home.

⁴ PY8 HEA Franklin Customer Survey Responses from Franklin Energy

⁵ Illinois TRM v4.0, Section 5.3.11, page 610.

Recommendation 6. A minor adaptation in the software package to allow adding measures to existing Project IDs and limiting Project IDs to one per address could potentially eliminate this issue, and would result in more transparency in the data. This may require an additional “unit number” field in the data entry system for sites with multiple residences located at one address.

1. INTRODUCTION

1.1 Program Description

The PY8⁶ Home Energy Assessment (HEA) program is an assessment and direct install program jointly implemented by Commonwealth Edison Company (ComEd) and Peoples Gas and North Shore Gas (PG/NSG) with Franklin Energy Services implementing the program in the PG/NSG territory. The program is also jointly implemented by ComEd and Nicor Gas with CLEAResult implementing the program in the Nicor Gas territory. This report focuses solely on the electric savings from the program. Savings from natural gas measures are included in separate evaluation reports. The primary objective of this residential direct install program was to secure energy savings through direct installation of low-cost efficiency measures, such as water efficient showerheads and faucet aerators, pipe insulation, programmable thermostats, and compact florescent lamps (CFLs) at eligible single family residences. New to the program in PY8 was the introduction of direct install outdoor LEDs, co-pay indoor LEDs, co-pay smart thermostats and power strips. Measures with verified electric savings were CFLs, LEDs, programmable thermostats, smart thermostats, smart strips and hot water heating savings (when the hot water was electrically heated). The secondary objective of this program was to function as the “gateway” for homeowners to participate in other residential programs. HEA performs a brief assessment of the major retrofit opportunities (e.g., furnace, boiler, air conditioning, insulation, and air sealing) and brings heightened awareness to the homeowners about available additional efficiency programs offered by ComEd, Peoples Gas, North Shore Gas, and Nicor Gas.

1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for PY8.

1.2.1 Impact Questions

1. What are the program’s verified gross savings?
2. What are the program’s verified net savings?
3. What is the level of free ridership associated with this program?⁷
4. What is the level of spillover associated with this program?
5. What updates are recommended for the Illinois Technical Reference Manual (TRM)?

1.2.2 Process Questions

1. Through a literature search, determine how co-pays affect the LED and smart thermostat net-to-gross ratios.

⁶ The PY8 program year began June 1, 2015 and ended May 31, 2016.

⁷ Navigant proposes to conduct primary NTG research with PY9 participants to be used for future NTG recommendations.

2. EVALUATION APPROACH

Navigant reviewed the ex ante gross savings estimates by totaling all Home Energy Assessment measures from the program tracking database. Navigant compared ex ante to ex post savings to find the measure- and program-level realization rates. The net-to-gross ratio (NTGR) for this program year was approved through the Illinois Stakeholder Advisory Group (IL SAG) stakeholder consensus process. 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 review of program tracking data and verification of direct install savings according to the Illinois TRM v4.0. Participant surveys were used to conduct net-to-gross (NTG) research to inform NTG recommendations for the future. The full set of data collection activities are 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	July – September 2016	Source of information for verified gross analysis
In Depth Interviews	Program Manager/Implementer Staff	4	4	Summer 2016	Included program management and implementation contractor staff
Participant Survey	Participants	80	TBD	October – November 2016	NTG research conducted to be considered for future use.

Table 2-2. Additional Resources

Reference Source	Author	Application	Gross Impacts
Illinois Technical Reference Manual Version 4.0	Illinois Stakeholder Advisory Group	HEA measure impact analysis	X

2.2 Verified Savings Parameters

Verified gross and net savings (energy and coincident peak demand) resulting from the PY8 program were calculated using the following algorithms as defined by the Illinois TRM version 4.0⁸ and version 5.0⁹, when appropriate.

2.2.1 CFL and LED Replacement

$$\text{Verified Gross Annual kWh Savings} = \text{Program Bulb Quantity} * \Delta\text{Watts}/1000 * \text{ISR} * \text{HOU} * \text{WHF}_{\text{energy}}$$

Where:

- ΔWatts = Difference between Baseline Wattage and Efficient (LED) Wattage, Evaluated
- HOU = Annual Hours of Use, Deemed
- $\text{WHF}_{\text{energy}}$ = Energy Waste Heat Factor, Deemed

$$\text{Verified Gross Annual kW Savings} = \text{Program Bulb Quantity} * \Delta\text{Watts}/1000$$

⁸ Source: <http://www.ilsag.info/technical-reference-manual.html>

⁹ Source: <http://www.ilsag.info/technical-reference-manual.html>

$$\text{Verified Gross Annual Peak kW Savings} = \text{Gross Annual kW Savings} * \text{Peak Load Coincidence Factor} * \text{WHF}_{\text{demand}}$$

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.
- $\text{WHF}_{\text{demand}}$ = Demand Waste Heat Factor

2.2.2 Low Flow Faucet Aerators

$$\text{Verified Gross Annual kWh Savings} = ((\text{GPM}_{\text{base}} * \text{L}_{\text{base}} - \text{GPM}_{\text{low}} * \text{L}_{\text{low}}) * \text{Household} * 365.25 * \text{DF} / \text{FPH}) * \text{EPG}_{\text{electric}} * \text{ISR}$$

Where:

- GPM_{base} = Average baseline flowrate, Gallons per minute, Deemed
- L_{base} = Average baseline daily faucet use per capita, Deemed
- GPM_{low} = Average low flowrate, Gallons per minute, Deemed
- L_{low} = Average baseline daily faucet use per capita, Deemed
- Household = Average number of people per household, Deemed
- 365.25 = Number of days per year
- DF = Drain Factor, Deemed
- FPH = Faucets per household, Deemed
- $\text{EPG}_{\text{electric}}$ = Energy per gallon of water used supplied by electric water heater, Deemed
- ISR = In Service Rate, Deemed

$$\begin{aligned} \text{Verified Gross Annual Peak kW Savings} &= \text{Gross Annual Energy Savings} / \text{HOU} \\ \text{Verified Gross Annual Peak kW Savings} &= \text{Gross Annual Energy Savings} / \text{HOU} * \text{CF} \end{aligned}$$

2.2.3 Low Flow Showerheads

$$\text{Verified Gross Annual kWh Savings} = ((\text{GPM}_{\text{base}} * \text{L}_{\text{base}} - \text{GPM}_{\text{low}} * \text{L}_{\text{low}}) * \text{Household} * \text{SPCD} * 365.25 * \text{SPH}) * \text{EPG}_{\text{electric}} * \text{ISR}$$

Where:

- SPCD = Showers per capita per day, Deemed
- SPH = Showers per household, Deemed

$$\begin{aligned} \text{Verified Gross Annual Peak kW Savings} &= \text{Gross Annual Energy Savings} / \text{HOU} \\ \text{Verified Gross Annual Peak kW Savings} &= \text{Gross Annual Energy Savings} / \text{HOU} * \text{CF} \end{aligned}$$

2.2.4 Smart Strips

$$\begin{aligned} \text{Verified Gross Annual Peak kW Savings} &= \text{Gross Annual Energy Savings} / \text{HOU} \\ \text{Verified Gross Annual Peak kW Savings} &= \text{Gross Annual Energy Savings} / \text{HOU} * \text{CF} \end{aligned}$$

2.2.5 Programmable Thermostats

$$\text{Verified Gross Annual kWh Savings} = \text{Electric Heating Consumption} * \text{Heating Reduction} * \text{HF} * \text{ISR} + (\Delta\text{Therms} * \text{F}_e * 29.3)$$

Where:

- Heating Reduction = Assumed percentage reduction in total household heating energy consumption due to programmable thermostat, Deemed
- HF = Household Factor, Deemed
- ISR = In Service Rate, Deemed
- F_e = Furnace fan energy consumption as a percentage of annual fuel consumption, Deemed
- 29.3 = kWh per therm conversion
- Δ Therms is calculated as follows

$$\Delta\text{Therms} = \% \text{Fossil Heat} * \text{Gas Heating Consumption} * \text{Heating Reduction} * \text{HF} * \text{ISR}$$

2.2.6 Water Heater Pipe Insulation

$$\text{Verified Gross Annual kWh Savings} = ((1/R_{\text{exist}} = 1/R_{\text{new}}) * \text{Length of Insulation} * \text{Circumference of Pipe} * \Delta T * 8,766) / (\text{Water Heater Efficiency} * 3,413)$$

Where:

- R_{exist} = Existing pipe thermal resistance, Deemed
- R_{new} = Total pipe thermal resistance after adding insulation, claimed based on pipe insulation used
- ΔT = Temperature difference between the water in the pipe and the surrounding air, Deemed
- 3,413 = Conversion from BTU to kWh

2.2.7 Deemed Values

Navigant calculated verified gross direct install savings for the PY8 HEA program using algorithms, assumptions, and input parameters defined in the Illinois TRM v4.0. Table 2-32-3 shows the deemed input values used in these algorithms and calculations.

Table 2-3. TRM Deemed Savings Input Parameters Used in Ex Post Analysis

Verified Gross and Net Input Parameters	Value	Data Source
CFL In-Service Rate (ISR)	0.969	IL TRM v4.0, Section 5.5.1
CFL HOU (Interior / Exterior)	793 / 2,475	IL TRM v4.0, Section 5.5.1
CFL WHF _{energy} (Interior / Exterior)	1.06 / 1.00	IL TRM v4.0, Section 5.5.1
CFL WHF _{demand} (Interior / Exterior)	1.11 / 1.00	IL TRM v4.0, Section 5.5.1
CFL CF	0.074	IL TRM v4.0, Section 5.5.1
LED ISR	0.969	IL TRM v4.0, Section 5.5.8
LED HOU (Interior / Exterior)	759 / 2,475	IL TRM v4.0, Section 5.5.8
LED WHF _{energy} (Interior / Exterior)	1.06 / 1.00	IL TRM v4.0, Section 5.5.8
LED WHF _{demand} (Interior / Exterior)	1.11 / 1.00	IL TRM v4.0, Section 5.5.8
LED CF	0.071	IL TRM v4.0, Section 5.5.8
Faucet Aerator GPM _{base}	1.39	IL TRM v4.0, Section 5.4.4
Faucet Aerator L _{base} (Kitchen / Bathroom)	4.5 / 1.6	IL TRM v4.0, Section 5.4.4
Faucet Aerator GPM _{low}	0.94	IL TRM v4.0, Section 5.4.4
Faucet Aerator L _{low} (Kitchen / Bathroom)	4.5 / 1.6	IL TRM v4.0, Section 5.4.4
Faucet Aerator Household (Single Family / Multi Family)	2.56 / 2.1	IL TRM v4.0, Section 5.4.4
Faucet Aerator DF (Kitchen / Bathroom)	0.75 / 0.90	IL TRM v4.0, Section 5.4.4
Faucet Aerator FPH (Kitchen / SF Bath / MF Bath)	1 / 2.83 / 1.5	IL TRM v4.0, Section 5.4.4
Faucet Aerator EPG _{electric} (Kitchen / Bath)	0.0969 / 0.0795	IL TRM v4.0, Section 5.4.4
Faucet Aerator ISR (SF / MF Kitchen / MF Bath)	0.95 / 0.91 / 0.95	IL TRM v4.0, Section 5.4.4
Faucet Aerator HOU (SF K / SF B / MF K / MF B)	94 / 14 / 77 / 22	IL TRM v4.0, Section 5.4.4
Faucet Aerator CF	0.022	IL TRM v4.0, Section 5.4.4
Shower GPM _{base}	2.67	IL TRM v4.0, Section 5.4.5
Shower L _{base}	7.8	IL TRM v4.0, Section 5.4.5
Shower GPM _{low}	1.5	IL TRM v4.0, Section 5.4.5
Shower L _{low}	7.8	IL TRM v4.0, Section 5.4.5
Shower Household (Single Family / Multi Family)	2.56 / 2.1	IL TRM v4.0, Section 5.4.5
Shower SPCD	0.6	IL TRM v4.0, Section 5.4.5
SPH (Single Family / Multi Family)	1.79 / 1.3	IL TRM v4.0, Section 5.4.5
Shower EPG _{electric}	0.117	IL TRM v4.0, Section 5.4.5
Shower ISR (SF / MF)	0.98 / 0.95	IL TRM v4.0, Section 5.4.5
Shower HOU (SF / MF)	302 / 248	IL TRM v4.0, Section 5.4.5
Shower CF	0.0278	IL TRM v4.0, Section 5.4.5
Smart Strip Energy Savings (5-plug / 7-plug)	56.5 / 103	IL TRM v4.0, Section 5.2.1
Smart Strip CF	0.80	IL TRM v4.0, Section 5.2.1
Smart Strip HOU	7,129	IL TRM v4.0, Section 5.2.1
Programmable Thermostat Electric Heating Consumption (Electric Resistance / Heat Pump / Gas)	20,764 / 12,214 / 0	IL TRM v4.0, Section 5.3.11
Programmable Thermostat Gas Heating Consumption [Therms] (Electric Resistance / Heat Pump / Gas)	0 / 0 / 1,005	IL TRM v4.0, Section 5.3.11
Programmable Thermostat Heating Reduction	0.062	IL TRM v4.0, Section 5.3.11
Programmable Thermostat HF (Single Family / Multi Family)	1 / 0.65	IL TRM v4.0, Section 5.3.11
Programmable Thermostat ISR	1	IL TRM v4.0, Section 5.3.11
Programmable Thermostat F _e	0.0314	IL TRM v4.0, Section 5.3.11
DHW R _{exist}	1	IL TRM v4.0, Section 5.4.1
DHW R _{new}	4.2	IL TRM v4.0, Section 5.4.1
DHW ΔT	60	IL TRM v4.0, Section 5.4.1
DHW Circumference of Pipe	0.196	IL TRM v4.0, Section 5.4.1

2.2.8 Smart Thermostats

The savings for smart, or “advanced,” thermostats were calculated using deemed savings values based on application type and heating fuel that were discussed and agreed upon prior to this program year. The calculations done by Navigant used the algorithms presented below from the Illinois TRM v5.0, Section 5.3.16, as version 4.0 did not address advanced thermostats. Navigant also used population data specific to the HEA participants to more accurately represent the target population.

$$\text{Verified Gross Annual kWh Savings} = \text{Electric Heating Consumption} * \text{Heating Reduction} * \text{HF} * \text{ISR} + (\Delta\text{Therms} * F_e * 29.3)$$

Where:

- Heating Reduction = Assumed percentage reduction in total household heating energy consumption due to programmable thermostat, Deemed
- HF = Household Factor, Deemed
- ISR = In Service Rate, Deemed
- F_e = Furnace fan energy consumption as a percentage of annual fuel consumption, Deemed
- 29.3 = kWh per therm conversion

The deemed input parameters for smart thermostats are summarized in the table below.

Table 2-4. Deemed Savings Input Parameters and Sources

Verified Gross and Net Input Parameters	Value	Data Source
Smart Thermostat Electric Heating Consumption (Electric Resistance / Heat Pump / Gas)	20,764 / 12,214 / 0	IL TRM v5.0, Section 5.3.16
Smart Thermostat Heating Reduction (Manual Baseline / Programmable BL / Unknown BL)	0.088 / 0.056 / 0.067	IL TRM v5.0, Section 5.3.16
Smart Thermostat HF (Single Family / Multi Family)	1 / 0.65	IL TRM v5.0, Section 5.3.16
Smart Thermostat ISR	1	IL TRM v5.0, Section 5.3.16
Smart Thermostat F_e	0.0314	IL TRM v5.0, Section 5.3.16

The agreed upon deemed savings values for gas heated homes are presented in the table below. No smart thermostats were installed in electrically heated homes.

Table 2-5. Smart Thermostat Deemed Savings by Baseline Type

Baseline Thermostat	Single Family Gross Annual Energy Saved (kWh)	Multi Family Gross Annual Energy Saved (kWh)
Manual Baseline	174.1	136.1
Programmable Baseline	144.5	116.9
Unknown Baseline	154.7	123.5

Source: Illinois Smart Thermostat Electric Impact Findings Memo, March 1, 2016. Navigant.

2.2.9 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 PY8, the NTGR estimates used to calculate the net verified savings were based on past evaluation research and defined through a negotiation process through SAG as documented in a spreadsheet.¹⁰

¹⁰ Source: ComEd_NTG_History_and_PY8_Recommendation_2016-02-26_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

Table 2-6. Net to Gross Ratios by Measure Type

Measure Type	NTG Value
CFLs	0.80
LEDs	0.80
Hot Water Measures	0.80
Programmable Thermostat Measures	0.90
Smart Thermostats	1.00
Smart Strips	0.95

Source: ComEd NTG History and PY8 Recommendations

2.3 Process Evaluation

A limited process evaluation was conducted for PY8. It was based on interviews with program manager staff and the implementation contractors to understand the program's performance and changes. Navigant was also tasked with conducting a literature search to try to determine how co-pays affect the LED and smart thermostat NTG ratios. The evaluation team was not able to find any other programs offering residential assessment programs with co-pay measures. Only residential assessment programs with free direct install measures or full weatherization programs were found. Primary research through a participant survey is being conducted with PY9 participants to determine NTG ratios for these co-pay measures for future use.

3. GROSS IMPACT EVALUATION

This section includes Navigant's gross impact evaluation results. Navigant performed a tracking system review on the program tracking system and calculated verified gross program savings. The program reported ex ante gross savings of 9,120 MWh and ex ante peak demand reduction of 0.888 MW. Navigant reports verified gross savings of 8,875 MWh, verified gross peak demand reduction of 0.914 MW, and verified gross total demand reduction of 8.408 MW, with corresponding verified gross realization rates of 97 percent for energy and 103 percent for peak demand savings, respectively.

3.1 Tracking System Review

For the PY8 evaluation, Navigant reviewed the ComEd program tracking system to verify the completeness and accuracy of the tracking system data and to identify any issues that would affect the impact evaluation of the HEA program. Navigant found the tracking data documents sufficient to complete the gross impact evaluation of the HEA program.

The key findings from the tracking system review include:

1. From Franklin Energy's database for the ComEd/PG/NSG program, Navigant identified six single family projects in the tracking database with ex ante savings claimed for multiple smart thermostat installations in one household, and one duplex (two households) claiming three smart thermostat installations. Navigant also identified 40 single-family households claiming more than one programmable thermostat measure.
2. From CLEARResult's database for the ComEd/Nicor Gas program, Navigant identified 45 single family projects with ex ante savings claimed for more than one smart thermostat installations in one household. These project IDs are documented in Table 7-775 in Appendix Section 7.2. There were only ten non-single family units classified as "multi-family units of 2-4 units" and they each only claimed one unit. Navigant also identified 64 single-family households in CLEARResult's data set claiming more than one programmable thermostat measure. These projects are identified in Table 7-886 in Appendix Section 7.2.
3. Navigant capped ex ante deemed savings at one smart or programmable thermostat per household, per the Illinois TRM v4.0 and v5.0. This did allow two for duplexes, three for triplexes, etc. If the household had claimed savings for more than one smart or programmable thermostat installed or more than one thermostat reprogrammed, Navigant applied savings for the single programmable thermostat.
4. Both the Franklin Energy database for the ComEd/PG/NSG territory and the CLEARResult database for the ComEd/Nicor Gas territory used single family savings values for low flow faucet aerators, low flow showerheads, programmable thermostats, and smart thermostats. Navigant discerned between single and multi-family homes, and used the appropriate savings values for each. This resulted in slightly higher total savings values for bathroom faucet aerators and showerheads, but slightly lower total savings values for kitchen faucet aerators. This also resulted in slightly lower per measure savings for smart and programmable thermostats installed in multi-family homes, but the effect of this slight reduction had a much smaller influence on the verified thermostat savings totals than the claiming of additional thermostats per household described in 1-3 above.

5. Both implementers used the wrong hours of use (HOU) for interior LED bulbs. For direct install CFLs installed in residential interiors, the TRM deems an annual HOU of 793¹¹. The implementers of both programs used this value for LEDs as well. However, the TRM deemed HOU for LEDs in identical applications is only 759¹².
6. The ComEd/Nicor Gas database did not identify baseline thermostats for smart thermostats installation, but did use two different savings values. Navigant assumed these represented different baseline thermostats, and used the corresponding deemed savings values for the appropriate baseline. Navigant assumed a programmable thermostat baseline when the tracking data claimed 152.6 kWh of savings and assumed a manual baseline when 180.1 kWh of savings were claimed. The ComEd/PG/NSG database used three baseline types: manual, unknown, and a third unlabeled type. Navigant assumed this third unlabeled thermostat type was for programmable thermostats as deemed savings per measure were virtually identical (database: 158.4 v Navigant: 158.396).
7. The implementers included identifiers for home type in the measure description in the tracking database. The implementers applied single family input parameters to all home types. Navigant applied multi-family parameters to home types defined as multi-family, as shown in Table 3-13-1.

Table 3-1. Home Types and Treatments

Identified Home Types	Implementers' Treatment	Navigant's Treatment
Duplex	Single Family	Multi Family†
Triplex	Single Family	Multi Family†
Multi-Family of 2-4 Units	Single Family	Multi Family†
Quadplex	Single Family	Multi Family†
Five or More Units	Single Family	Multi -Family
Single Detached	Single Family	Single Family
Single Family Attached	Single Family	Single Family
Single Family Detached	Single Family	Single Family

Source: ComEd tracking data and Navigant analysis.

†For Multi-family homes with a defined number of units, measures capped at one unit per household were capped at the number of units. (i.e., Duplexes were capped at two measures, Triplexes at 3 measures, MF of 2-4 Units and Quadplexes at 4 measures)

3.2 Program Volumetric Findings

In PY8, 17,127 customers participated in the HEA program. These are customers whose homes received a home assessment for this program. The program had 17,138 unique projects, based on unique project numbers in the tracking database. Eighty-six projects were not associated with an assessment in the database. These projects are identified in Table 7-664 in Appendix Section 7.2. The HEA program achieved 177,768 CFL installations at 13,326 unique projects in PY8, 43,761 LED installations at 6,195 unique projects, and a total of 701 feet of pipe insulation and 18,432 other direct install measures (not including CFLs or LEDs) with attributable savings. Table 3-23-2 shows the full volumetric detail for PY8.

¹¹ Illinois TRM v4.0, Section 5.5.1

¹² Illinois TRM v4.0, Section 5.5.8

Table 3-2. PY8 Volumetric Findings Detail

Participation	ComEd/PG/NSG	ComEd/Nicor Gas	Total Program
Assessments	12,233	4,894	17,127
Projects §	12,242	4,896	17,138
Installed Measures†	175,104	64,857	239,961
Number of Units/Project	14.2	13.2	13.9

Source: ComEd tracking data and Navigant team analysis.

§ The quantity of projects represents the number of unique project numbers, per the program tracking databases. There were 86 project IDs that were not associated with an assessment. These projects are detailed in the Appendix 7.2.

There are two associated reasons for the discrepancy: the software package used by implementers to track measures and savings does not allow retroactive editing or additions to existing Project IDs. Therefore, if an implementer would like to add measures to complete a project's data entry at a later time and date, they must create an additional Project ID associated with the site. Additionally, if an implementer is called back to a site to perform additional Direct Install Measures at a later date, a new Project ID must be added, but a new assessment is not done. Both of these situations result in multiple Project IDs, but only one assessment associated with a single site. This issue is discussed in Finding 10 and Recommendation 6.

Key findings include:

1. Customers touched by the program have increased 40 percent from PY7 (17,127 vs. 12,229).
2. Measures installed have increased 41 percent from PY7 (239,961 vs. 170,122).
3. Despite contributing 6.5 percent to overall energy savings, thermostat measures contribute almost zero to peak demand reduction.

Table 3-3 shows the program volumetric detail by measure type.

Table 3-3. PY8 Volumetric Measures Installed by Program and Measure Type

Participation	ComEd/PG/NSG Projects or Measures Installed	ComEd/Nicor Gas Projects or Measures Installed
Unique Projects§	12,317	4,896
Assessments (Jumpstart Site Visit)	12,233	4,894
Total Measures	175,104	64,857
Number of Units/Project	14.2	13.2
Direct Install Measures (non-CFLs or LEDs)	14,165	4,267
CFL Installations	131,073	46,695
LED Installations	29,866	13,895
Showerheads	164	298
Kitchen Faucet Aerators	52	121
Bathroom Faucet Aerators	148	280
Pipe Insulation	300	401
Programmable Thermostats	3,332	684
Reprogramming Thermostats	1,980	515
Smart Thermostats	900	465
Smart Strips	7,289	1,503

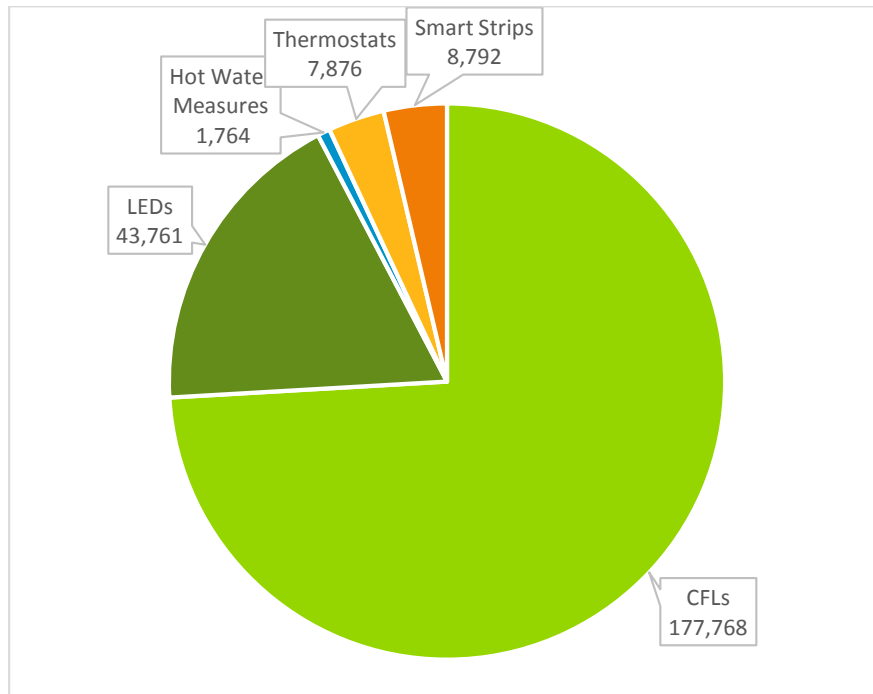
Source: ComEd tracking data and Navigant team analysis

§The quantity of projects represents the number of unique project numbers, per the program tracking databases. There were 86 project IDs that did not receive an assessment. These projects are detailed in the Appendix 7.2.

†Totals do not include the measure titled "Assessment" as nothing was "installed" in the Assessment measure.

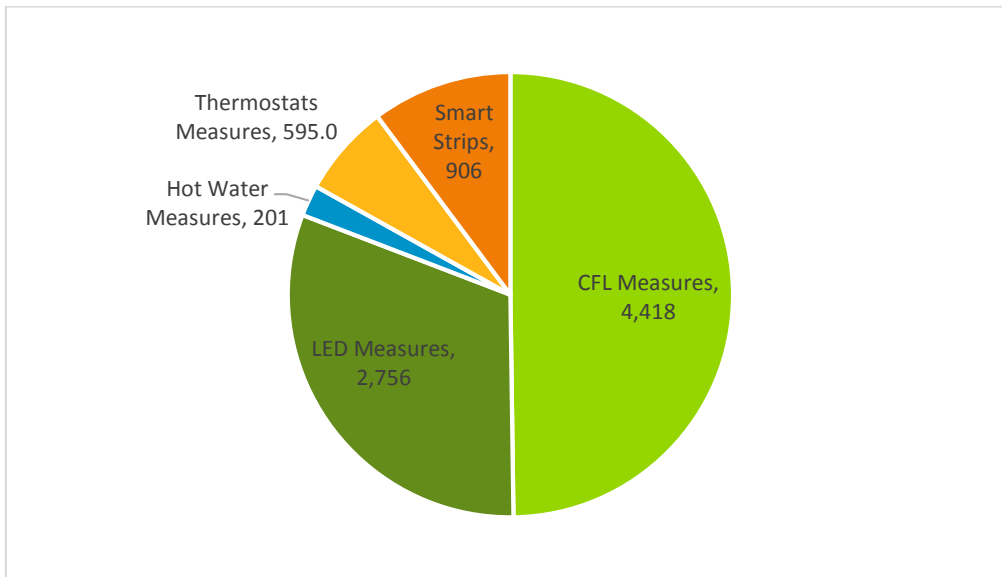
In depth tables documenting volumetric and savings analysis are presented in Appendix Section 7.1. Figure 3-1 through Figure 3-3 show installations of measures by type and verified gross energy and demand savings for the HEA program.

Figure 3-1. Number of Measures Installed by Type



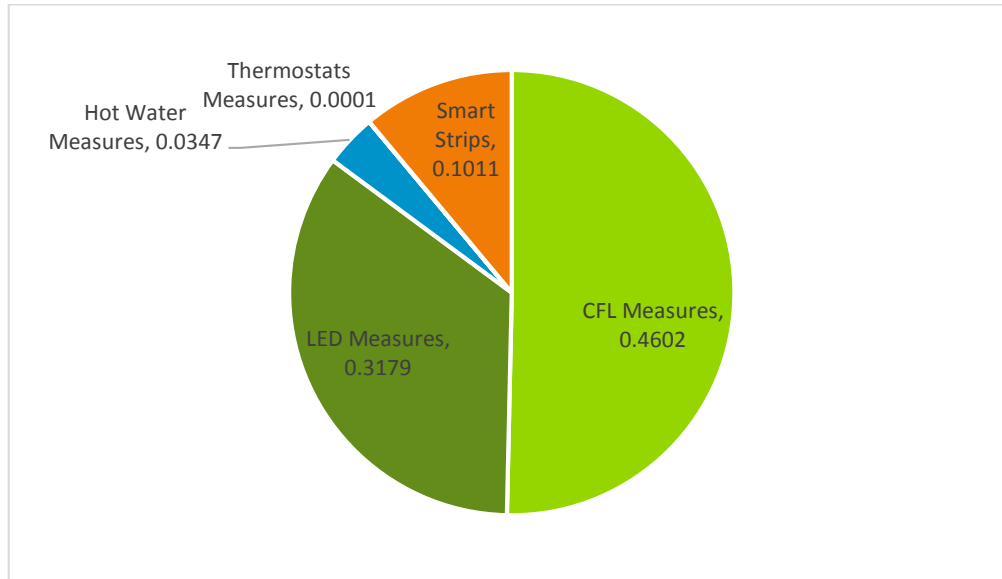
Source: Evaluation Analysis

Figure 3-2. Verified Gross MWh Energy Savings by Measure Type



Source: Evaluation Analysis

Figure 3-3. Verified Gross Peak Demand Savings by Measure Type



Source: Evaluation Analysis

3.3 Gross Program Impact Parameter Estimates

As described in Section 3.1, energy and demand savings are estimated using the formulae in the following sections of the Illinois TRM, version 4.

Table 3-4. Measure Savings Algorithm Sources

Implementation	Section in this Report	TRM v4.0 Section
CFL Installations	2.2.1	5.5.1
LED Installations	2.2.1	5.5.8
Showerheads	2.2.3	5.4.5
Kitchen Faucet Aerators	2.2.2	5.4.4
Bathroom Faucet Aerators	2.2.2	5.4.4
Domestic Hot Water Pipe Insulation	2.2.6	5.4.1
Programmable Thermostats	2.2.5	5.3.11
Reprogramming Thermostats	2.2.5	5.3.11
Smart Thermostats	2.2.8	5.3.16†
Smart Strips	2.2.4	5.2.1

Source: IL TRM v4.0 and this report.

† "Smart" or "Advanced" Thermostats are not in IL TRM v4.0. Instead, algorithms from TRM v5.0 were used.

3.4 Verified Gross Program Impact Results

The resulting total program verified gross savings is 8,875 MWh and 0.9140 peak MW as shown in Table 3-5.

Table 3-5. PY8 Verified Gross Impact Savings Estimates by Measure Type

	Gross Energy Savings (MWh)	Gross Peak Demand Savings (MW)
CFL Lighting Measures		
Ex-Ante Gross Savings	4,416	0.4486
Verified Gross Savings	4,418	0.4602
Verified Gross Realization Rate	100%	103%
LED Lighting Measures		
Ex-Ante Gross Savings	2,973	0.3062
Verified Gross Savings	2,756	0.3179
Verified Gross Realization Rate	93%	104%
Hot Water Measures		
Ex-Ante Gross Savings	198	0.0340
Verified Gross Savings	201	0.0347
Verified Gross Realization Rate	102%	102%
Programmable Thermostat Measures		
Ex-Ante Gross Savings	418	0
Verified Gross Savings	393	0
Verified Gross Realization Rate	94%	-
Smart Thermostat Measures		
Ex-Ante Gross Savings	210	<0.0001
Verified Gross Savings	202	0.0001
Verified Gross Realization Rate	96%	204%
Smart Strip Measures		
Ex-Ante Gross Savings	906	0.9940
Verified Gross Savings	906	0.1011
Verified Gross Realization Rate	100%	102%
Total		
Ex-Ante Gross Savings	9,120	0.8882
Verified Gross Savings	8,875	0.9140
Verified Gross Realization Rate	97%	103%

Source: Evaluation Team analysis.

4. NET IMPACT EVALUATION

SAG determined¹³ that the NTG values for this program should be deemed prospectively and used to calculate verified net savings. The following table shows the deemed NTG values and the PY8 verified net savings.

¹³ Source: ComEd_NTG_History_and_PY8_Recommendation_2016-02-26_Final_EMV_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

Table 4-1. PY8 Verified Gross and Net Impact Savings Estimates by Measure Type

	Energy Savings (MWh)	Peak Demand Savings (MW)
CFL Lighting Measures		
Ex-Ante Gross Savings	4,416	0.4486
Verified Gross Savings	4,418	0.4602
Verified Gross Realization Rate	100%	103%
NTGR	0.80	
Verified Net Savings	3,534	0.3681
LED Lighting Measures		
Ex-Ante Gross Savings	2,973	0.3062
Verified Gross Savings	2,756	0.3179
Verified Gross Realization Rate	93%	104%
NTGR	0.80	
Verified Net Savings	2,205	0.2544
Hot Water Measures		
Ex-Ante Gross Savings	198	0.0340
Verified Gross Savings	201	0.0347
Verified Gross Realization Rate	102%	102%
NTGR	0.80	
Verified Net Savings	161	0.0277
Programmable Thermostat Measures		
Ex-Ante Gross Savings	418	0
Verified Gross Savings	393	0
Verified Gross Realization Rate	94%	-
NTGR	0.90	
Verified Net Savings	354	0
Smart Thermostat Measures		
Ex-Ante Gross Savings	210	<0.0001
Verified Gross Savings	202	0.0001
Verified Gross Realization Rate	96%	204%
NTGR	1.00	
Verified Net Savings	202	0.0001
Smart Strip Measures		
Ex-Ante Gross Savings	906	0.0994
Verified Gross Savings	906	0.1011
Verified Gross Realization Rate	100%	102%
NTGR	0.95	
Verified Net Savings	860	0.0961
Total		
Ex-Ante Gross Savings	9,120	0.8882
Verified Gross Savings	8,875	0.9140
Verified Gross Realization Rate	97%	103%
NTGR	-	
Verified Net Savings	7,316	0.7464

Source: Evaluation Team analysis.

5. PROCESS EVALUATION

A limited process evaluation was conducted for the HEA program in PY8. Navigant conducted telephone interviews with program managers and implementation staff to learn about changes made to the program in PY8 as well as changes planned for PY9.

5.1 Co-Pay Measures Literature Review

Navigant was tasked with conducting a literature search to try to determine how co-pays affect the LED's and smart thermostat's NTG ratios. The evaluation team was not able to find any other programs offering residential assessment programs with co-pay measures. Only residential assessment programs with free direct install measures or full weatherization programs were found. Primary research through a participant survey is being conducted with PY9 participants to determine NTG ratios for these co-pay measures for future use.

5.2 Program Changes since PY7

There were several changes made to the HEA program in PY8 including an increase in savings targets, the measures offered, and the number of energy advisors sent to participant's homes to complete the assessment. These changes are discussed in the sections below.

5.2.1 Energy Savings Targets

The HEA program's energy savings targets were increased in PY8 compared to PY7. In PY7 the savings target for the program was 2,139 net MWh while the target for PY8 was 6,260 net MWh. The program exceeded its PY8 energy savings target due to higher than expected savings achieved per home.

5.2.2 Measures Offered

A major change for the HEA program in PY8 was the addition of new measures. These measures included LEDs (outdoor and indoor), smart thermostats and power strips. This is detailed in Table 5-15-1 below.

ComEd offered free direct install outdoor LEDs as well as indoor LEDs with a co-pay. In the beginning of the program year, the customer uptake for the co-pay LEDs was lower than expected. ComEd decreased the co-pay range amount from \$3.00 to \$10.00 to \$3.00 to \$5.00 in March to better align with the price in the market place. After this decrease in co-pay amounts, ComEd saw an increase in co-pay LED installations.

A smart thermostat with a co-pay of \$150 as well as a tier one advanced power strip were also new to the program in PY8. Because ComEd had never offered co-pay measures before, they were not sure how the smart thermostat was going to perform. The measure performed well with a 10 percent average installation rate among customers (much higher than what ComEd expected). The advanced power strip also performed well with a higher number of measures installed per home than expected.

Table 5-1. Measures Offered in the HEA Program

Measure	PY7	PY8
CFLs	Yes	Yes
Bathroom Aerators	Yes	Yes
Kitchen Aerators	Yes	Yes
Showerheads	Yes	Yes
Programmable Thermostats	Yes	Yes
Pipe Wrap	Yes	Yes
Co-Pay Smart Thermostats	No	ecobee3: Copay -\$150
Outdoor LEDs	No	Yes
Co-pay Indoor LEDs	No	Copay - \$3 to \$5
Advanced Power Strip	No	Tier 1

5.2.3 Energy Advisor Teams

Another change in PY8 was the size of energy advisor teams sent into participants' homes. In PY7, the program utilized two-person teams where they would do six to seven appointments in one day. In PY8, this was changed to a single person team where they would do four to five appointments in one day. In the beginning of the program year, there were 14 energy advisors. Towards the end of the program year, due to high interest in the program, the number increased to approximately 19 energy advisors. Customer experience was the main driver for this change. Based on previous years' experience, the implementation staff learned that customers felt more comfortable having only one person in their home and were also willing to engage in more meaningful conversations about energy usage.

5.3 Marketing and Outreach

ComEd's usual marketing efforts for the program included bill inserts, direct mailers, and email blasts. In the spring of 2016, ComEd implemented a marketing campaign that included radio, digital, and transit ads in order to help meet participation targets. This marketing campaign was territory wide, but the main focus was centered around Chicago because of the higher number of possible participants. The transit marketing included ads on CTA red and blue line trains. Due to the lack of participation seen from this effort, ComEd does not plan to do this again in PY9.

In PY8, Franklin Energy hosted 330 outreach events which was a major driver of program participation. These events generated 5,600 leads (someone who signs up on paper or requests a call back), and Franklin Energy's goal was to try to increase conversion rates from these leads. In Q1 and Q2 of PY8, they introduced a sign up tool which included bringing either iPads or laptops to these events to get customers to sign up for an assessment on the spot. There was a ramp up period in Q1 and Q2 but in Q3 and Q4, they noticed the conversion rate increase to almost 50 percent compared to the 20 to 25 percent they saw in previous program years. Their goal for PY9 is to get 50 percent of the program year's participants to sign up onsite at outreach events.

5.4 Participant Feedback

The HEA program used a leave-behind pre-paid survey requesting customers fill it out and return it, or to enter their feedback online via a website. Overall the participant satisfaction for the program in PY8 was very high, scoring 4.9 out of 5.¹⁴

¹⁴ PY8 HEA Franklin Customer Survey Responses from Franklin Energy.

5.5 Program Changes in PY9

ComEd has several changes planned for the program in PY9 including savings targets and the measures being offered. As stated in section 5.2.1 above, the savings target for PY8 was 6,260 net MWh. The savings target for PY9 has been increased to 8,700 net MWh due to the expected amount of savings each home should achieve.

There are several changes planned for the measures offered in PY9. Specialty LED bulbs will no longer be co-pay products; they will be free. ComEd will move away from offering CFLs even more in preparation for their next triennial plan as well as changes in ENERGY STAR ratings. Finally, they will offer a tier two advanced power strip in addition to the tier one advanced power strip offered in PY8. These changes are meant to provide customers more options, and as they may lose savings with certain measures, they want to continue to fill the gap with new and more efficient products.

6. FINDINGS AND RECOMMENDATIONS

The following provides insight into key program findings and recommendations.¹⁵ The program performed well in PY8, exceeding energy savings and participation targets for the year with high marks for customer satisfaction.

Program Participation

Finding 1. The program reached over 17,000 homes in the ComEd service area, exceeding the original participation target of 15,000 homes.

Program Savings

Finding 2. Overall, the HEA program achieved verified gross savings of 8,875 MWh with a corresponding verified gross realization rate of 97 percent for energy savings. For the ComEd/PG/NSG program, the verified gross savings were 6,194 MWh. For the ComEd/Nicor Gas program, the verified gross savings were 2,681 MWh.

Finding 3. Overall, the program achieved 117 percent of its planning target of 6,260 net MWh with verified net savings of 7,316 MWh.

Finding 4. Overall, the verified net peak demand reduction was 0.746 MW and the verified total net demand reduction was 6.75 MW.

Process Evaluation

Finding 5. The program is performing well. Participation and energy savings targets were exceeded this year. Comments about the program from participants are generally uniformly positive with a satisfaction rating of 4.9 out of 5.¹⁶

Impact Analysis

Finding 6. The implementers included identifiers for home type in the measure description in the tracking database. The implementers applied single-family input parameters to all home types. Navigant used the available data to apply multi-family input parameters when appropriate. A summary of ex ante and ex post assumptions for single and multi-family homes are presented in Table 3-13-1 in Section 3.

Recommendation 1. Multi-family homes should use input parameters per the Illinois TRM specific to multi-family homes, resulting in slightly different savings values when appropriate. For future program years, seek agreement early in the program year between Navigant and the implementation contractor(s) regarding definition of single-family and multi-family configuration savings calculations' inputs.

Finding 7. Some multi-family style condominium homes were assigned the inappropriate "Single Family" building types (see 201 Decatur Ave). As discussed in Finding 6 and Recommendation 1 above, multifamily and single family building types receive different savings values due to shared walls, ceilings, floors, HVAC systems, and/or other differences.

Recommendation 2. Identify clear criteria distinguishing single family and multi-family type homes, and reiterate the importance of accurately identifying home type with implementation contractors.

Finding 8. Some homes received more than one programmable thermostat or smart "advanced" thermostat. The implementers credited savings for each installed (or reprogrammed) thermostat, but the TRM clearly states "Energy savings are applicable at the household level;

¹⁵ 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.

¹⁶ PY8 HEA Franklin Customer Survey Responses from Franklin Energy

all thermostats controlling household heat should be programmable and installation of multiple programmable thermostats per home does not accrue additional savings.”¹⁷

Navigant limited savings to those of a single measure per home. As stated in Table 3-1, this allowed duplexes to have two measures; triplexes, three, etc.

Recommendation 3. Per the TRM, for programmable and smart thermostats measures, cap household savings at one unit per household.

Recommendation 4. Include baseline thermostat types in the tracking data.

Finding 9. The Illinois TRM specifies separate hours-of-use (HOU) values for CFL and LED bulbs installed in similar locations. The implementer applied the same HOU to both CFL and LED measures. Navigant updated the HOU assumptions based on CFL and LED measure types.

Recommendation 5. Use the appropriate HOU values for CFL and LED measures, per the Illinois TRM.

Finding 10. Some homes are associated with more than one Project ID. There were 86 project IDs that were not associated with an assessment. These projects are detailed in the Appendix 7.2. There are two associated reasons for the discrepancy: the software package used by implementers to track measures and savings does not allow retroactive editing or additions to existing Project IDs. Therefore, if an implementer would like to add measures to complete a project's data entry at a later time and date, they must create an additional Project ID associated with the site. Additionally, if an implementer is called back to a site to perform additional Direct Install Measures at a later date, a new Project ID must be added, but a new assessment is not done. Both of these situations result in multiple Project IDs, but only one assessment associated with a single site.

Recommendation 6. A minor adaptation in the software package to allow adding measures to existing Project IDs and limiting Project IDs to one per address could potentially eliminate this issue, and would result in more transparency in the data. This may require an additional “unit number” field in the data entry system for sites with multiple residences located at one address.

¹⁷ Illinois TRM v4.0, Section 5.3.11, page 610.

7. APPENDIX

7.1 Gross Savings Analysis

7.1.1 ComEd and PG/NSG Territories Data from Franklin Energy

Table 7-1. Franklin Energy’s Project, Measure Counts, and Savings by Measure

Measure	Gross Total kWh - Ex Ante	Gross Total Peak kW - Ex Ante	Gross Total kWh - Ex Post	Gross Total Peak kW - Ex Post	Gross Total kW - Ex Post
01. Unit Visit Fee - NSG/ComEd SF PY5/8	0	0.00	0	0.00	0
01. Unit Visit Fee - PG/ComEd SF PY5/8	0	0.00	0	0.00	0
08. Gas Tstat - Furnace - Program NSG/ComEd SF PY5/8	18,622	0.00	18,004	0.00	0
08. Gas Tstat - Furnace - Program PG/ComEd SF PY5/8	163,763	0.00	151,013	0.00	0
09. Gas Tstat - Furnace - Re-Program NSG/ComEd SF PY5/8	15,127	0.00	14,929	0.00	0
09. Gas Tstat - Furnace - Re-Program PG/ComEd SF PY5/8	92,711	0.00	87,451	0.00	0
10. Gas Tstat - Furnace - No Savings Program NSG/ComEd SF PY5/8	0	0.00	0	0.00	0
10. Gas Tstat - Furnace - No Savings Program PG/ComEd SF PY5/8	0	0.00	0	0.00	0
11. Gas Tstat - Furnace - No Savings Re-Program NSG/ComEd SF PY5/8	0	0.00	0	0.00	0
11. Gas Tstat - Furnace - No Savings Re-Program PG/ComEd SF PY5/8	0	0.00	0	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) - Manual BL NSG/ComEd SF PY5/8	4,641	0.00	4,640	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) - Manual BL PG/ComEd SF PY5/8	25,143	0.00	25,140	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings NSG/ComEd SF PY5/8	0	0.00	0	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings PG/ComEd SF PY5/8	158	0.00	0	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL NSG/ComEd SF PY5/8	3,150	0.00	2,360	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL PG/ComEd SF PY5/8	14,350	0.00	13,317	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) NSG/ComEd SF PY5/8	25,502	0.00	25,502	0.00	0
16. Gas Tstat - Furnace - Smart Stat (\$150) PG/ComEd SF PY5/8	63,835	0.00	63,833	0.00	0
17. Gas Tstat - Furnace - Power Extender Kit (PEK) NSG/ComEd SF PY5/8	0	0.00	0	0.00	0
17. Gas Tstat - Furnace - Power Extender Kit (PEK) PG/ComEd SF PY5/8	0	0.00	0	0.00	0
18. CFL - 9W NSG/ComEd SF PY5/8	14,466	1.35	14,466	1.41	19
18. CFL - 9W PG/ComEd SF PY5/8	73,403	6.78	73,405	7.17	97
19. CFL - 13W NSG/ComEd SF PY5/8	161,577	15.57	161,813	15.81	214
19. CFL - 13W PG/ComEd SF PY5/8	1,340,609	129.25	1,342,569	131.19	1,773
19. CFL - 14W NSG/ComEd SF PY5/8	48,421	4.62	48,423	4.73	64
19. CFL - 14W PG/ComEd SF PY5/8	301,344	28.66	301,358	29.45	398
20. CFL - 19W NSG/ComEd SF PY5/8	28,853	2.67	28,857	2.82	38
20. CFL - 19W PG/ComEd SF PY5/8	239,380	21.98	239,412	23.39	316
21. CFL - 23W NSG/ComEd SF PY5/8	43,023	3.97	43,025	4.20	57
21. CFL - 23W PG/ComEd SF PY5/8	294,775	27.01	294,787	28.81	389
22. CFL - 9W Globe NSG/ComEd SF PY5/8	97,558	11.91	97,542	11.99	160
22. CFL - 9W Globe PG/ComEd SF PY5/8	268,925	32.65	268,881	33.05	441
23. CFL - 14W Globe NSG/ComEd SF PY5/8	56,395	6.78	56,398	6.93	92
23. CFL - 14W Globe PG/ComEd SF PY5/8	340,483	40.74	340,503	41.85	558
24. LED - 40W (\$3) NSG/ComEd SF PY5/8	3,082	0.30	2,950	0.29	4

Measure	Gross Total kWh - Ex Ante	Gross Total Peak kW - Ex Ante	Gross Total kWh - Ex Post	Gross Total Peak kW - Ex Post	Gross Total kW - Ex Post
24. LED - 40W (\$3) PG/ComEd SF PY5/8	12,419	1.19	11,886	1.16	16
24. LED - 40W/6W (\$3) NSG/ComEd SF PY5/8	1,761	0.17	1,686	0.17	2
24. LED - 40W/6W (\$3) PG/ComEd SF PY5/8	3,840	0.35	3,676	0.36	5
25. LED - 60W (\$3) NSG/ComEd SF PY5/8	37,354	3.56	33,654	3.30	46
25. LED - 60W (\$3) PG/ComEd SF PY5/8	119,482	11.33	107,646	10.54	149
26. LED - 75W (\$10) NSG/ComEd SF PY5/8	534	0.05	480	0.05	1
26. LED - 75W (\$10) PG/ComEd SF PY5/8	2,605	0.25	2,341	0.23	3
26. LED - 75W (\$5) NSG/ComEd SF PY5/8	401	0.04	360	0.04	0
26. LED - 75W (\$5) PG/ComEd SF PY5/8	1,770	0.17	1,591	0.16	2
27. LED - 100W (\$10) NSG/ComEd SF PY5/8	1,389	0.13	1,329	0.13	2
27. LED - 100W (\$10) PG/ComEd SF PY5/8	3,718	0.35	3,559	0.35	5
27. LED - 100W (\$5) NSG/ComEd SF PY5/8	448	0.04	429	0.04	1
27. LED - 100W (\$5) PG/ComEd SF PY5/8	3,987	0.38	3,816	0.37	5
28. LED - 40W (\$3) Candelabra NSG/ComEd SF PY5/8	28,021	2.98	17,872	2.98	25
28. LED - 40W (\$3) Candelabra PG/ComEd SF PY5/8	94,073	9.96	60,002	10.02	83
28. LED - 40W (\$5) Candelabra NSG/ComEd SF PY5/8	28,235	3.00	18,009	3.01	25
28. LED - 40W (\$5) Candelabra PG/ComEd SF PY5/8	124,361	13.15	79,320	13.24	109
29. LED - 65W (\$3) Flood NSG/ComEd SF PY5/8	61,299	6.77	52,140	6.67	73
29. LED - 65W (\$3) Flood PG/ComEd SF PY5/8	159,749	17.62	135,880	17.37	191
29. LED - 65W (\$7) Flood NSG/ComEd SF PY5/8	86,705	9.59	73,750	9.43	104
29. LED - 65W (\$7) Flood PG/ComEd SF PY5/8	175,846	19.39	149,601	19.12	210
29.5. LED Outdoor - 60W (No CoPay) NSG/ComEd SF PY5/8	51,997	1.42	50,493	5.57	20
29.5. LED Outdoor - 60W (No CoPay) PG/ComEd SF PY5/8	122,576	3.16	119,031	13.13	48
30. LED Outdoor - 75W (No CoPay) NSG/ComEd SF PY5/8	11,308	1.21	11,032	1.22	4
30. LED Outdoor - 75W (No CoPay) PG/ComEd SF PY5/8	50,935	5.33	49,692	5.48	20
31. LED Outdoor - 100W (No CoPay) NSG/ComEd SF PY5/8	12,400	1.35	12,399	1.37	5
31. LED Outdoor - 100W (No CoPay) PG/ComEd SF PY5/8	42,343	4.58	42,342	4.67	17
32. LED Outdoor - PAR38 120W Flood (No CoPay) NSG/ComEd SF PY5/8	120,874	13.28	116,268	12.82	47
32. LED Outdoor - PAR38 120W Flood (No CoPay) PG/ComEd SF PY5/8	323,337	35.38	311,018	34.31	126
33. LED Outdoor - 65W Flood (No CoPay) NSG/ComEd SF PY5/8	29,527	3.25	29,010	3.20	12
33. LED Outdoor - 65W Flood (No CoPay) PG/ComEd SF PY5/8	48,924	5.37	48,081	5.30	19
34. LED Outdoor - 40W Candelabra (No CoPay) NSG/ComEd SF PY5/8	39,620	4.36	39,620	4.37	16
34. LED Outdoor - 40W Candelabra (No CoPay) PG/ComEd SF PY5/8	32,317	3.51	32,317	3.56	13
35. Smart Strip - 7-prong NSG/ComEd SF PY5/8	104,854	11.53	104,854	11.71	15
35. Smart Strip - 7-prong PG/ComEd SF PY5/8	645,913	70.98	645,913	72.12	90
36. Electric Aerator - Bathroom NSG/ComEd SF PY5/8	535	1.02	623	0.97	1
36. Electric Aerator - Bathroom PG/ComEd SF PY5/8	1,863	3.57	2,426	3.38	3

Measure	Gross Total kWh - Ex Ante	Gross Total Peak kW - Ex Ante	Gross Total kWh - Ex Post	Gross Total Peak kW - Ex Post	Gross Total kW - Ex Post
37. Electric Aerator - Kitchen NSG/ComEd SF PY5/8	1,307	0.30	1,195	0.29	0
37. Electric Aerator - Kitchen PG/ComEd SF PY5/8	5,489	1.26	4,929	1.23	1
38. Electric Showerhead - NSG/ComEd SF PY5/8	6,888	0.63	7,105	0.70	1
38. Electric Showerhead - PG/ComEd SF PY5/8	27,880	2.55	29,244	3.00	3
39. Electric Showerhead - Handheld NSG/ComEd SF PY5/8	4,264	0.39	4,388	0.43	0
39. Electric Showerhead - Handheld PG/ComEd SF PY5/8	14,760	1.35	15,721	1.67	2
40. Electric Pipe Insulation - DHW Outlet NSG/ComEd SF PY5/8	1,199	0.12	1,198	0.13	0
40. Electric Pipe Insulation - DHW Outlet PG/ComEd SF PY5/8	5,852	0.58	5,849	0.67	1
41. Electric Tstat - Heat Pump - Program NSG/ComEd SF PY5/8	757	0.00	757	0.00	0
41. Electric Tstat - Heat Pump - Program PG/ComEd SF PY5/8	6,058	0.00	4,468	0.00	0
42. Electric Tstat - Heat Pump - Re-Program NSG/ComEd SF PY5/8	757	0.00	757	0.00	0
43. Electric Tstat - Resistance - Program NSG/ComEd SF PY5/8	2,575	0.00	2,124	0.00	0
43. Electric Tstat - Resistance - Program PG/ComEd SF PY5/8	3,862	0.00	3,411	0.00	0
44. Electric Tstat - Resistance - Re-Program PG/ComEd SF PY5/8	5,149	0.00	4,248	0.00	0
ZZ LED - 65W (\$7) Flood (11W Actual) NSG/ComEd SF PY5/8	3,773	0.42	3,475	0.33	5
ZZ LED - 65W (\$7) Flood (11W Actual) PG/ComEd SF PY5/8	7,451	0.82	6,862	0.64	9
ZZ LED Outdoor - 65W Flood (No CoPay) (11W Actual) NSG/ComEd SF PY5/8	1,166	0.13	1,166	0.13	0
ZZ LED Outdoor - 65W Flood (No CoPay) (11W Actual) PG/ComEd SF PY5/8	2,849	0.31	2,849	0.31	1
Total	6,428,653	612.82	6,194,468	634.56	6,158

Table 7-2. Franklin Energy's Average Savings per Measure by Measure

Measure	Total Projects	Total Measures	Average kWh per Measure - Ex Ante	Average peak kW per Measure - Ex Ante	Average kWh per Measure - Ex Post	Average peak kW per Measure - Ex Post
01. Unit Visit Fee - NSG/ComEd SF PY5/8	1,505	1,504	0.00	0.0000	0.00	0.0000
01. Unit Visit Fee - PG/ComEd SF PY5/8	10,739	10,729	0.00	0.0000	0.00	0.0000
08. Gas Tstat - Furnace - Program NSG/ComEd SF PY5/8	325	325	57.30	0.0000	55.40	0.0000
08. Gas Tstat - Furnace - Program PG/ComEd SF PY5/8	2,859	2,858	57.30	0.0000	52.84	0.0000
09. Gas Tstat - Furnace - Re-Program NSG/ComEd SF PY5/8	264	264	57.30	0.0000	56.55	0.0000
09. Gas Tstat - Furnace - Re-Program PG/ComEd SF PY5/8	1,618	1,618	57.30	0.0000	54.05	0.0000
10. Gas Tstat - Furnace - No Savings Program NSG/ComEd SF PY5/8	23	25	0.00	0.0000	0.00	0.0000
10. Gas Tstat - Furnace - No Savings Program PG/ComEd SF PY5/8	107	110	0.00	0.0000	0.00	0.0000
11. Gas Tstat - Furnace - No Savings Re-Program NSG/ComEd SF PY5/8	20	26	0.00	0.0000	0.00	0.0000
11. Gas Tstat - Furnace - No Savings Re-Program PG/ComEd SF PY5/8	66	67	0.00	0.0000	0.00	0.0000
16. Gas Tstat - Furnace - Smart Stat (\$150) - Manual BL NSG/ComEd SF PY5/8	25	25	185.63	0.0000	185.61	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) - Manual BL PG/ComEd SF PY5/8	135	135	186.25	0.0000	186.22	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings NSG/ComEd SF PY5/8	21	25	0.00	0.0000	0.00	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings PG/ComEd SF PY5/8	48	51	158.40	0.0000	0.00	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL NSG/ComEd SF PY5/8	14	18	175.00	0.0000	168.56	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL PG/ComEd SF PY5/8	78	82	175.00	0.0000	168.56	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) NSG/ComEd SF PY5/8	161	161	158.40	0.0000	158.40	#DIV/0!
16. Gas Tstat - Furnace - Smart Stat (\$150) PG/ComEd SF PY5/8	409	403	158.40	0.0000	158.40	#DIV/0!
17. Gas Tstat - Furnace - Power Extender Kit (PEK) NSG/ComEd SF PY5/8	131	144	0.00	0.0000	0.00	0.0000
17. Gas Tstat - Furnace - Power Extender Kit (PEK) PG/ComEd SF PY5/8	418	439	0.00	0.0000	0.00	0.0000
18. CFL - 9W NSG/ComEd SF PY5/8	170	888	16.29	0.0014	16.29	0.0016
18. CFL - 9W PG/ComEd SF PY5/8	980	4,506	16.27	0.0014	16.29	0.0016
19. CFL - 13W NSG/ComEd SF PY5/8	764	6,622	24.37	0.0023	24.44	0.0024
19. CFL - 13W PG/ComEd SF PY5/8	6,250	54,943	24.39	0.0023	24.44	0.0024
19. CFL - 14W NSG/ComEd SF PY5/8	207	2,050	23.51	0.0022	23.62	0.0023
19. CFL - 14W PG/ComEd SF PY5/8	1,427	12,758	23.59	0.0022	23.62	0.0023

Measure	Total Projects	Total Measures	Average kWh per Measure - Ex Ante	Average peak kW per Measure - Ex Ante	Average kWh per Measure - Ex Post	Average peak kW per Measure - Ex Post
20. CFL - 19W NSG/ComEd SF PY5/8	295	1,042	27.69	0.0024	27.69	0.0027
20. CFL - 19W PG/ComEd SF PY5/8	2,681	8,645	27.68	0.0024	27.69	0.0027
21. CFL - 23W NSG/ComEd SF PY5/8	332	1,078	39.91	0.0035	39.91	0.0039
21. CFL - 23W PG/ComEd SF PY5/8	2,465	7,386	39.89	0.0034	39.91	0.0039
22. CFL - 9W Globe NSG/ComEd SF PY5/8	466	4,794	20.35	0.0025	20.35	0.0025
22. CFL - 9W Globe PG/ComEd SF PY5/8	2,307	13,215	20.33	0.0024	20.35	0.0025
23. CFL - 14W Globe NSG/ComEd SF PY5/8	272	1,868	30.19	0.0035	30.19	0.0037
23. CFL - 14W Globe PG/ComEd SF PY5/8	2,052	11,278	30.18	0.0036	30.19	0.0037
24. LED - 40W (\$3) NSG/ComEd SF PY5/8	33	172	17.92	0.0016	17.15	0.0017
24. LED - 40W (\$3) PG/ComEd SF PY5/8	122	693	17.92	0.0016	17.15	0.0017
24. LED - 40W/6W (\$3) NSG/ComEd SF PY5/8	9	94	18.73	0.0017	17.93	0.0018
24. LED - 40W/6W (\$3) PG/ComEd SF PY5/8	40	205	18.73	0.0016	17.93	0.0018
25. LED - 60W (\$3) NSG/ComEd SF PY5/8	170	1,349	27.69	0.0026	24.95	0.0024
25. LED - 60W (\$3) PG/ComEd SF PY5/8	691	4,315	27.69	0.0025	24.95	0.0024
26. LED - 75W (\$10) NSG/ComEd SF PY5/8	6	16	33.40	0.0030	30.02	0.0029
26. LED - 75W (\$10) PG/ComEd SF PY5/8	24	78	33.40	0.0031	30.02	0.0029
26. LED - 75W (\$5) NSG/ComEd SF PY5/8	4	12	33.40	0.0030	30.02	0.0029
26. LED - 75W (\$5) PG/ComEd SF PY5/8	17	53	33.40	0.0031	30.02	0.0029
27. LED - 100W (\$10) NSG/ComEd SF PY5/8	16	31	44.80	0.0041	42.88	0.0042
27. LED - 100W (\$10) PG/ComEd SF PY5/8	34	83	44.80	0.0041	42.88	0.0042
27. LED - 100W (\$5) NSG/ComEd SF PY5/8	6	10	44.80	0.0041	42.88	0.0042
27. LED - 100W (\$5) PG/ComEd SF PY5/8	31	89	44.80	0.0041	42.88	0.0042
28. LED - 40W (\$3) Candelabra NSG/ComEd SF PY5/8	77	655	42.78	0.0045	27.29	0.0046
28. LED - 40W (\$3) Candelabra PG/ComEd SF PY5/8	346	2,199	42.78	0.0045	27.29	0.0046
28. LED - 40W (\$5) Candelabra NSG/ComEd SF PY5/8	83	660	42.78	0.0045	27.29	0.0046
28. LED - 40W (\$5) Candelabra PG/ComEd SF PY5/8	489	2,907	42.78	0.0045	27.29	0.0046
29. LED - 65W (\$3) Flood NSG/ComEd SF PY5/8	93	1,216	50.41	0.0055	42.88	0.0055

Measure	Total Projects	Total Measures	Average kWh per Measure - Ex Ante	Average peak kW per Measure - Ex Ante	Average kWh per Measure - Ex Post	Average peak kW per Measure - Ex Post
29. LED - 65W (\$3) Flood PG/ComEd SF PY5/8	299	3,169	50.41	0.0055	42.88	0.0055
29. LED - 65W (\$7) Flood NSG/ComEd SF PY5/8	117	1,720	50.41	0.0055	42.88	0.0055
29. LED - 65W (\$7) Flood PG/ComEd SF PY5/8	352	3,489	50.40	0.0055	42.88	0.0055
29.5. LED Outdoor - 60W (No CoPay) NSG/ComEd SF PY5/8	235	638	81.50	0.0021	79.14	0.0087
29.5. LED Outdoor - 60W (No CoPay) PG/ComEd SF PY5/8	923	1,504	81.41	0.0020	79.14	0.0087
30. LED Outdoor - 75W (No CoPay) NSG/ComEd SF PY5/8	51	115	98.33	0.0104	95.93	0.0106
30. LED Outdoor - 75W (No CoPay) PG/ComEd SF PY5/8	365	518	98.33	0.0101	95.93	0.0106
31. LED Outdoor - 100W (No CoPay) NSG/ComEd SF PY5/8	45	94	131.91	0.0142	131.91	0.0145
31. LED Outdoor - 100W (No CoPay) PG/ComEd SF PY5/8	205	321	131.91	0.0141	131.91	0.0145
32. LED Outdoor - PAR38 120W Flood (No CoPay) NSG/ComEd SF PY5/8	136	480	251.82	0.0276	242.23	0.0267
32. LED Outdoor - PAR38 120W Flood (No CoPay) PG/ComEd SF PY5/8	544	1,284	251.82	0.0274	242.23	0.0267
33. LED Outdoor - 65W Flood (No CoPay) NSG/ComEd SF PY5/8	45	216	136.70	0.0150	134.30	0.0148
33. LED Outdoor - 65W Flood (No CoPay) PG/ComEd SF PY5/8	147	358	136.65	0.0150	134.30	0.0148
34. LED Outdoor - 40W Candelabra (No CoPay) NSG/ComEd SF PY5/8	57	472	83.94	0.0092	83.94	0.0093
34. LED Outdoor - 40W Candelabra (No CoPay) PG/ComEd SF PY5/8	116	385	83.94	0.0091	83.94	0.0093
35. Smart Strip - 7-prong NSG/ComEd SF PY5/8	556	1,018	102.81	0.0112	103.00	0.0115
35. Smart Strip - 7-prong PG/ComEd SF PY5/8	3,469	6,271	102.88	0.0112	103.00	0.0115
36. Electric Aerator - Bathroom NSG/ComEd SF PY5/8	17	33	16.20	0.0310	18.27	0.0294
36. Electric Aerator - Bathroom PG/ComEd SF PY5/8	69	115	16.20	0.0310	21.56	0.0294
37. Electric Aerator - Kitchen NSG/ComEd SF PY5/8	9	10	130.70	0.0301	121.37	0.0294
37. Electric Aerator - Kitchen PG/ComEd SF PY5/8	41	42	130.70	0.0300	117.04	0.0294
38. Electric Showerhead - NSG/ComEd SF PY5/8	15	21	328.00	0.0300	338.33	0.0335
38. Electric Showerhead - PG/ComEd SF PY5/8	64	85	328.00	0.0300	345.44	0.0358
39. Electric Showerhead - Handheld NSG/ComEd SF PY5/8	10	13	328.00	0.0300	337.30	0.0331
39. Electric Showerhead - Handheld PG/ComEd SF PY5/8	36	45	328.00	0.0300	348.67	0.0368
40. Electric Pipe Insulation - DHW Outlet NSG/ComEd SF PY5/8	10	51	23.50	0.0023	23.49	0.0026
40. Electric Pipe Insulation - DHW Outlet PG/ComEd SF PY5/8	48	249	23.50	0.0023	23.49	0.0027

Measure	Total Projects	Total Measures	Average kWh per Measure - Ex Ante	Average peak kW per Measure - Ex Ante	Average kWh per Measure - Ex Post	Average peak kW per Measure - Ex Post
41. Electric Tstat - Heat Pump - Program NSG/ComEd SF PY5/8	1	1	757.30	0.0000	757.26	0.0000
41. Electric Tstat - Heat Pump - Program PG/ComEd SF PY5/8	7	8	757.30	0.0000	558.48	0.0000
42. Electric Tstat - Heat Pump - Re-Program NSG/ComEd SF PY5/8	1	1	757.30	0.0000	757.26	0.0000
43. Electric Tstat - Resistance - Program NSG/ComEd SF PY5/8	2	2	757.30	0.0000	1,062.07	0.0000
43. Electric Tstat - Resistance - Program PG/ComEd SF PY5/8	3	3	757.30	0.0000	1,137.16	0.0000
44. Electric Tstat - Resistance - Re-Program PG/ComEd SF PY5/8	4	4	757.30	0.0000	1,062.07	0.0000
ZZ LED - 65W (\$7) Flood (11W Actual) NSG/ComEd SF PY5/8	5	79	47.76	0.0052	43.98	0.0041
ZZ LED - 65W (\$7) Flood (11W Actual) PG/ComEd SF PY5/8	21	156	47.76	0.0052	43.98	0.0041
ZZ LED Outdoor - 65W Flood (No CoPay) (11W Actual) NSG/ComEd SF PY5/8	4	9	129.51	0.0140	129.51	0.0143
ZZ LED Outdoor - 65W Flood (No CoPay) (11W Actual) PG/ComEd SF PY5/8	8	22	129.51	0.0141	129.51	0.0143

Table 7-3. Franklin Energy’s Project, Measure, and Savings Counts by Aggregated Measure

Measure	Total Projects	Total Measures	Gross Total kWh - Ex Ante	Gross Total Peak kW - Ex Ante	Gross Total kWh - Ex Post	Gross Total Peak kW - Ex Post	Gross Total kW - Ex Post
Jumpstart Site Visit	12,244	12,233	0	0.00	0	0.00	0
Gas Tstat - Furnace – Program	3,184	3,183	182,386	0.00	169,067	0.00	0
Gas Tstat - Furnace - ReProgram	1,882	1,882	107,839	0.00	102,411	0.00	0
Gas Tstat - Furnace - Smart Tstat	822	824	136,622	0.00	134,792	0.00	0
Gas Tstat - Furnace - Program - No Savings	130	135	0	0.00	0	0.00	0
Gas Tstat - Furnace - ReProgram - No Savings	86	93	0	0.00	0	0.00	0
Gas Tstat - Furnace - Smart Tstat - No Savings	69	76	158	0.00	0	0.00	0
Power Extender	549	583	0	0.00	0	0.00	0
9W CFL	1,150	5,394	87,868	8.13	87,871	8.59	116
13W CFL	7,014	61,565	1,502,186	144.82	1,504,381	147.01	1,987
14W CFL	1,634	14,808	349,765	33.28	349,782	34.18	462
19W CFL	2,976	9,687	268,233	24.65	268,269	26.21	354
23W CFL	2,797	8,464	337,798	30.98	337,812	33.01	446
9W CFL Globe	2,773	18,009	366,483	44.56	366,422	45.04	600
14W CFL Globe	2,324	13,146	396,878	47.52	396,901	48.78	650
LED - 40W Equiv	155	865	15,501	1.49	14,836	1.45	20
LED - 40W/6W	49	299	5,600	0.52	5,361	0.53	7
LED - 60W Equiv	861	5,664	156,836	14.89	141,300	13.84	195
LED - 75W Equiv	51	159	5,311	0.50	4,772	0.47	7
LED - 100W Equiv	87	213	9,542	0.90	9,133	0.89	13
LED - 40W Equiv Candelabra	995	6,421	274,690	29.09	175,203	17.16	242
LED - 65W Equiv Flood	861	9,594	483,599	53.37	411,372	40.30	568
LED - 65W Equiv /11W Flood	26	235	11,224	1.23	10,336	0.97	14
LED Outdoor - 60W Equiv	1,158	2,142	174,573	4.57	169,524	18.70	68
LED Outdoor - 75W Equiv	416	633	62,243	6.54	60,724	6.70	25

Measure	Total Projects	Total Measures	Gross Total kWh - Ex Ante	Gross Total Peak kW - Ex Ante	Gross Total kWh - Ex Post	Gross Total Peak kW - Ex Post	Gross Total kW - Ex Post
LED Outdoor - 100W Equiv	250	415	54,743	5.92	54,741	6.04	22
LED Outdoor - PAR38 120W Equiv	680	1,764	444,210	48.66	427,286	47.13	173
LED Outdoor - 65W Equiv Flood	192	574	78,451	8.62	75,714	8.35	31
LED Outdoor - 65W Equiv/11W Flood	12	31	4,015	0.44	4,015	0.44	2
LED Outdoor - 40W Equiv Candelabra	173	857	71,937	7.86	71,936	7.93	29
Smart Strip	4,025	7,289	750,767	82.52	750,767	83.82	105
Aerator - Bathroom – Electric	86	148	2,398	4.59	3,049	4.35	4
Aerator - Kitchen – Electric	50	52	6,796	1.56	6,124	1.53	2
Showerhead – Electric	79	106	34,768	3.18	36,349	3.71	4
Showerhead - Handheld - Electric	46	58	19,024	1.74	20,109	2.10	2
Pipe Insulation - DHW Outlet - Electric	58	300	7,050	0.70	6,937	0.79	1
Electric Tstat - Heat Pump - Program	8	9	6,815	0.00	5,227	0.00	0
Electric Tstat - Heat Pump - ReProgram	1	1	757	0.00	758	0.00	0
Electric Tstat - Resistance - Program	5	5	6,437	0.00	5,538	0.00	0
Electric Tstat - Resistance - ReProgram	4	4	5,149	0.00	4,250	0.00	0
Total	49,962	187,920	6,428,653	612.82	6,193,068	610.02	6,147

* Franklin's measure data set includes duplicate measure lines to distinguish between the PG and NSG territories. This table aggregates all duplicate measures to consolidate the list into unique measures.

7.1.2 ComEd and Nicor Gas Territory Data from CLEAResult

Table 7-4. CLEAResult’s Project, Measure Counts, and Savings by Measure

Measure	Total Projects	Total Measures	Total kWh Ex Ante	Total kWh Ex Post	Total kW Ex Ante (Peak)	Total kW Ex Post (Peak)	Total kW Ex Post (Total)
9W CFL	990	4,827	78,633	78,634	7.3080	7.6840	103.84
13W CFL	3,028	23,213	567,225	567,225	54.4290	55.4282	749.03
18W CFL	484	1,200	34,210	34,210	3.0640	3.3429	45.17
23W CFL	585	1,509	60,226	60,227	5.4350	5.8852	79.53
9W Globe	1,441	11,695	237,953	237,954	28.9620	29.2462	389.95
14W Globe	649	4,251	128,345	128,345	15.4200	15.7745	210.33
Interior LED - LED A-Line 7W	49	242	4,332	4,151	0.4120	0.4066	5.73
Interior LED - LED A-Line 9W	238	1,448	40,110	38,381	3.8130	3.7597	52.95
Interior LED - LED A-Line 13W	37	162	5,281	5,052	0.5020	0.4949	6.97
Interior LED - LED 17W	30	90	4,032	3,859	0.3810	0.3780	5.32
Interior LED - LED Candelabra 5W	209	1,382	59,150	59,122	6.2640	6.2952	52.03
Interior LED - BR30	271	2,429	120,236	120,295	13.3010	13.3139	146.31
Exterior LED - LED A-Line 13W	1,565	4,814	461,663	461,812	50.3240	50.9392	186.59
Exterior LED - LED A-Line 17W	222	559	73,732	73,735	8.0480	8.1332	29.79
Exterior - LED Candelabra 5W	264	2,016	169,142	169,222	18.6010	18.6657	68.37
Exterior LED - 19W PAR38	276	753	182,377	182,396	19.9760	20.1188	73.70
Aerator - Bath – Electric	172	280	4,536	4,835	8.6800	8.2320	8.23
Aerator - Kitchen – Electric	114	121	15,815	15,199	3.6370	3.5574	3.56
Showerhead - Handheld – Electric	96	114	37,392	37,733	3.4210	3.5425	3.54
Showerhead - Standard – Electric	136	184	60,352	61,034	5.5210	5.7606	5.76
Pipe Insulation – Electric	63	401	9,424	9,419	0.9350	1.0745	1.07
Programmable Thermostat – Heat Pump	1	2	757	757	0.0000	0.0000	0.00
Programmable Thermostat – Joint	640	666	36,672	36,268	0.0000	0.0000	0.00
Programmable Thermostat - Electric Resistance Heat	15	16	19,311	17,057	0.0000	0.0000	0.00
Thermostat Education – Joint	452	491	25,040	25,195	0.0000	0.0000	0.00
Thermostat Education - Electric Resistance Heat	24	24	27,035	26,841	0.0000	0.0000	0.00
Programmable Thermostat - Smart	424	465	73,338	66,971	0.0550	0.1121	0.33
Smart Power Strip	1,050	1,503	154,809	154,809	16.8810	17.2845	21.61
Power Extender Kit	215	233	0	0	0.0000	0.0000	0.00
Assessment – ComEd	206	206	0	0	0.0000	0.0000	0.00
Assessment – Joint	4,688	4,688	0	0	0.0000	0.0000	0.00
Total	18,634	69,984	2,691,127	2,680,738	275.4	279.4	2,249.7

Table 7-5. CLEAResult's Average Savings per Measure by Measure

Measure	Total Projects	Total Measures	Average kWh per Measure - Ex Ante	Average Peak kW per Measure - Ex Ante	Average kWh per Measure - Ex Post	Average Peak kW per Measure - Ex Post
9W CFL	990	4,827	16.29	0.0014	16.29	0.0016
13W CFL	3,028	23,213	24.44	0.0023	24.44	0.0024
18W CFL	484	1,200	28.51	0.0024	28.51	0.0028
23W CFL	585	1,509	39.91	0.0034	39.91	0.0039
9W Globe	1,441	11,695	20.35	0.0025	20.35	0.0025
14W Globe	649	4,251	30.19	0.0036	30.19	0.0037
Interior LED - LED A-Line 7W	49	242	17.90	0.0016	17.15	0.0017
Interior LED - LED A-Line 9W	238	1,448	27.70	0.0026	26.51	0.0026
Interior LED - LED A-Line 13W	37	162	32.60	0.0031	31.18	0.0031
Interior LED - LED 17W	30	90	44.80	0.0041	42.88	0.0042
Interior LED - LED Candelabra 5W	209	1,382	42.80	0.0045	42.78	0.0046
Interior LED - BR30	271	2,429	49.32	0.0054	49.52	0.0055
Exterior LED - LED A-Line 13W	1,565	4,814	95.84	0.0103	95.93	0.0106
Exterior LED - LED A-Line 17W	222	559	131.90	0.0143	131.91	0.0145
Exterior - LED Candelabra 5W	264	2,016	83.90	0.0092	83.94	0.0093
Exterior LED - 19W PAR38	276	753	242.20	0.0265	242.23	0.0267
Aerator - Bath - Electric	172	280	16.20	0.0310	17.33	0.0294
Aerator - Kitchen - Electric	114	121	130.70	0.0300	125.54	0.0294
Showerhead - Handheld - Electric	96	114	328.00	0.0300	331.55	0.0313
Showerhead - Standard - Electric	136	184	328.00	0.0300	331.88	0.0314
Pipe Insulation - Electric	63	401	23.50	0.0023	23.49	0.0027
Programmable Thermostat - Heat Pump	1	2	378.65	0.0000	378.63	0.0000
Programmable Thermostat - Joint	640	666	57.30	0.0000	56.67	0.0000
Programmable Thermostat - Electric Resistance Heat	15	16	1,287.40	0.0000	1,137.16	0.0000
Thermostat Education - Joint	452	491	57.30	0.0000	55.99	0.0000
Thermostat Education - Electric Resistance Heat	24	24	1,287.40	0.0000	1,118.39	0.0000
Programmable Thermostat - Smart	424	465	157.70	0.0550	158.32	0.1121
Smart Power Strip	1,050	1,503	102.80	0.0111	103.00	0.0115
Power Extender Kit	215	233	0.00	0.0000	0.00	0.0000
Assessment - ComEd	206	206	0.00	0.0000	0.00	0.0000
Assessment - Joint	4,688	4,688	0.00	0.0000	0.00	0.0000

7.2 Volumetric Anomalies

Table 7-6. Projects Which Did Not Receive an Assessment

Implementer	Project ID
CLEAResult	RBT-427836
CLEAResult	RBT-663250
Franklin	988380
Franklin	993225
Franklin	993380
Franklin	993445
Franklin	996684
Franklin	996833
Franklin	997231
Franklin	997251
Franklin	997862
Franklin	999195
Franklin	999219
Franklin	1000318
Franklin	1004590
Franklin	1015896
Franklin	1016154
Franklin	1016779
Franklin	1025849
Franklin	1029618
Franklin	1029704
Franklin	1030141
Franklin	1032333
Franklin	1034873
Franklin	1040057
Franklin	1050921
Franklin	1051189
Franklin	1051402
Franklin	1054022
Franklin	1054089
Franklin	1072845
Franklin	1074220
Franklin	1075031
Franklin	1075551
Franklin	1082281
Franklin	1088673
Franklin	1090691
Franklin	1092532
Franklin	1100733

Implementer	Project ID
Franklin	1104668
Franklin	1109191
Franklin	1114023
Franklin	1115670
Franklin	1115910
Franklin	1121839
Franklin	1123597
Franklin	1124262
Franklin	1139979
Franklin	1156810
Franklin	1156812
Franklin	1156862
Franklin	1167813
Franklin	1175730
Franklin	1177518
Franklin	1200192
Franklin	1215775
Franklin	1218523
Franklin	1220958
Franklin	1223234
Franklin	1227766
Franklin	1234426
Franklin	1235032
Franklin	1238549
Franklin	1239434
Franklin	1243640
Franklin	1243950
Franklin	1246235
Franklin	1248761
Franklin	1256922
Franklin	1264529
Franklin	1269971
Franklin	1285445
Franklin	1285487
Franklin	1287265
Franklin	1296334
Franklin	1296340
Franklin	1304018
Franklin	1304233
Franklin	1315004

Implementer	Project ID
Franklin	1320721
Franklin	1328386
Franklin	1329733
Franklin	1330324
Franklin	1330931
Franklin	1333800
Franklin	1340079

Table 7-7. Smart Thermostat Quantity Anomalies

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Gross kWh Per_Tstat	Ex Ante Total_Gross kWh	Ex Post Gross kWh Per_Tstat	Ex Post Total_Gross kWh	Ex Post Baseline	Cooling Type	Ex Post Treatment Notes
Franklin	1039211	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings NSG/ComEd SF PY5/8	2	0.0	0.0	0.0	0.0	NA	None	Credited 0
Franklin	1039733	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL PG/ComEd SF PY5/8	2	175.0	350.0	168.6	168.6	Unknown Baseline	None	Claimed 2, Credited 1
Franklin	1051498	Triplex	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL PG/ComEd SF PY5/8	2	175.0	350.0	168.6	337.1	Unknown Baseline	None	Claimed 2, Credited 2
Franklin	1068615	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL NSG/ComEd SF PY5/8	3	175.0	525.0	168.6	168.6	Unknown Baseline	None	Claimed 3, Credited 1
Franklin	1097184	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings PG/ComEd SF PY5/8	3	0.0	0.0	0.0	0.0	NA	None	Credited 0
Franklin	1123453	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL PG/ComEd SF PY5/8	2	175.0	350.0	168.6	168.6	Unknown Baseline	None	Claimed 2, Credited 1
Franklin	1128877	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings NSG/ComEd SF PY5/8	2	0.0	0.0	0.0	0.0	NA	None	Credited 0
Franklin	1151475	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL NSG/ComEd SF PY5/8	2	175.0	350.0	168.6	168.6	Unknown Baseline	None	Claimed 2, Credited 1

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Gross kWh Per_Tstat	Ex Ante Total_Gross kWh	Ex Post Gross kWh Per_Tstat	Ex Post Total_Gross kWh	Ex Post Baseline	Cooling Type	Ex Post Treatment Notes
Franklin	1177883	Duplex	16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings NSG/ComEd SF PY5/8	3	0.0	0.0	0.0	0.0	NA	None	Credited 0
Franklin	1198850	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL PG/ComEd SF PY5/8	2	175.0	350.0	168.6	168.6	Unknown Baseline	None	Claimed 2, Credited 1
Franklin	1219893	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - No Savings PG/ComEd SF PY5/8	2	0.0	0.0	0.0	0.0	NA	None	Credited 0
Franklin	1240038	Single Detached	16. Gas Tstat - Furnace - Smart Stat (\$150) - Unknown BL NSG/ComEd SF PY5/8	2	175.0	350.0	168.6	168.6	Unknown Baseline	None	Claimed 2, Credited 1
Franklin	1167704	Duplex	16. Gas Tstat - Furnace - Smart Stat (\$150) PG/ComEd SF PY5/8	0	0.0	0.0	0.0	0.0	NA	None	Claimed 0, Credited 0
CLEARResult	RBT-641408	Single Family Attached	Programmable Thermostat - Smart	0	0.0	0.0	0.0	0.0	NA		Claimed 0, Credited 0
CLEARResult	RBT-428980	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-453451	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-461492	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-474198	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Gross kWh Per_Tstat	Ex Ante Total_Gross kWh	Ex Post Gross kWh Per_Tstat	Ex Post Total_Gross kWh	Ex Post Baseline	Cooling Type	Ex Post Treatment Notes
CLEARResult	RBT-474750	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-506526	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-513067	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-515177	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-519765	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-522089	Single Family Detached	Programmable Thermostat - Smart	3	152.6	457.7	154.7	154.7	Unknown Baseline	Unknown	Claimed 3, Credited 1
CLEARResult	RBT-522840	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-524982	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-529011	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-530058	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-536310	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-537585	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Gross kWh Per_Tstat	Ex Ante Total_Gross kWh	Ex Post Gross kWh Per_Tstat	Ex Post Total_Gross kWh	Ex Post Baseline	Cooling Type	Ex Post Treatment Notes
CLEARResult	RBT-538864	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-541748	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-546959	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-547190	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-566458	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-583988	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-613808	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-616730	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-619816	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-635120	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-641355	Single Family Attached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-643669	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Gross kWh Per_Tstat	Ex Ante Total_Gross kWh	Ex Post Gross kWh Per_Tstat	Ex Post Total_Gross kWh	Ex Post Baseline	Cooling Type	Ex Post Treatment Notes
CLEARResult	RBT-650696	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-671286	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-692554	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-692797	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-707767	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-727698	Single Family Detached	Programmable Thermostat - Smart	3	152.6	457.7	154.7	154.7	Unknown Baseline	Unknown	Claimed 3, Credited 1
CLEARResult	RBT-732012	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-733524	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-734972	Single Family Detached	Programmable Thermostat - Smart	2	180.1	360.2	174.1	174.1	Manual Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-771830	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-790029	Single Family Detached	Programmable Thermostat - Smart	2	152.6	305.1	154.7	154.7	Unknown Baseline	Unknown	Claimed 2, Credited 1
CLEARResult	RBT-527142	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	180.08	180.08	174.1	174.1	Manual Baseline	Unknown	Claimed 1, Credited 1

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Gross kWh Per_Tstat	Ex Ante Total_Gross kWh	Ex Post Gross kWh Per_Tstat	Ex Post Total_Gross kWh	Ex Post Baseline	Cooling Type	Ex Post Treatment Notes
CLEARResult	RBT-529185	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	180.08	180.08	174.1	174.1	Manual Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-543495	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	152.57	152.57	154.7	154.7	Unknown Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-544021	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	152.57	152.57	154.7	154.7	Unknown Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-552272	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	152.57	152.57	154.7	154.7	Unknown Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-564860	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	180.08	180.08	174.1	174.1	Manual Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-568179	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	152.57	152.57	154.7	154.7	Unknown Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-635188	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	180.08	180.08	174.1	174.1	Manual Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-640606	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	152.57	152.57	154.7	154.7	Unknown Baseline	Unknown	Claimed 1, Credited 1
CLEARResult	RBT-694066	Multi-Family of 2-4 Units	Programmable Thermostat - Smart	1	180.08	180.08	174.1	174.1	Manual Baseline	Unknown	Claimed 1, Credited 1

Table 7-8. Single-Family Homes Claiming Multiple Programmable Thermostats

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Claimed Gross kWh per Measure	Ex Ante Claimed Gross Total kWh
CLEARResult	RBT-371677	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-374512	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-377902	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-400888	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-409239	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-416949	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-422154	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-426713	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-428419	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-450846	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-456421	Single Family Attached	Thermostat Education - Joint	3	19.1	57.3
CLEARResult	RBT-461097	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-463800	Single Family Detached	Thermostat Education - Joint	4	14.3	57.3
CLEARResult	RBT-465667	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-477457	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-485282	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-486875	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-486986	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-492291	Single Family Attached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-494055	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-495976	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-499198	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-520493	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-523795	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-524183	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Claimed Gross kWh per Measure	Ex Ante Claimed Gross Total kWh
CLEARResult	RBT-524554	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-526937	Single Family Detached	Programmable Thermostat – Heat Pump	2	378.7	757.3
CLEARResult	RBT-530656	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-532596	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-538043	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-541417	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-541989	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-542082	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-552551	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-561760	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-563726	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-567997	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-576406	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-580433	Single Family Detached	Programmable Thermostat - Electric Resistance Heat	2	643.7	1,287.4
CLEARResult	RBT-581767	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-598259	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-612329	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-612815	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-617648	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-617705	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-618340	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-619902	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-624737	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-625143	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-627188	Single Family Detached	Thermostat Education - Joint	3	19.1	57.3
CLEARResult	RBT-628719	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3

Implementer	Project ID	Building Type	Measure Name	Measure Quantity	Ex Ante Claimed Gross kWh per Measure	Ex Ante Claimed Gross Total kWh
CLEARResult	RBT-634572	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-649917	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-656198	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-665082	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-674506	Single Family Detached	Thermostat Education - Joint	3	19.1	57.3
CLEARResult	RBT-677191	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-677789	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-684518	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-685275	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-687608	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3
CLEARResult	RBT-696443	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-696537	Single Family Detached	Programmable Thermostat - Joint	2	28.7	57.3
CLEARResult	RBT-727962	Single Family Detached	Thermostat Education - Joint	2	28.7	57.3