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March 13, 2018

Via Federal Express

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, Second Floor
Harrisburg, Pennsylvania 17120

Re: Revised Phase III Energy Efficiency and Conservation Program Annual Report for June 1, 2016 through May 31, 2017, PUC Docket No. M-2015-2515691

Dear Secretary Chiavetta:

In accordance with Section IV.E.2 of the Commission's Opinion and Order Letter dated March 17, 2016 (Docket No. M-2015-2515691), enclosed is a revised PECO's Phase III Annual Energy Efficiency & Conservation Report for the period June 1, 2016 through May 31, 2017.

The report was originally filed on November 15, 2017. This report is being refiled due to some adjustments agreed to between the SWE and Navigant.

PECO is providing a copy of the report to the Act 129 Statewide Evaluator (NMR Group) and is also posting the report on the PECO website.

Please acknowledge receipt of the foregoing on the enclosed copy of this letter.

If you have any further questions regarding this matter, please call me at 215-841-5777.

Sincerely,

cc: C. Walker-Davis, Director, Office of Special Assistants
P. T. Diskin, Director, Bureau of Technical Utility Services
K. Monaghan, Director, Bureau of Audits
R. Kanaskie, Director, Bureau of Investigation & Enforcement
Office of Consumer Advocate
Office of Small Business Advocate
McNees, Wallace & Nurick

Enclosures

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

NAVIGANT

Final Annual Report to the Pennsylvania Public Utility Commission

Phase III of Act 129

Program Year 8

(June 1, 2016 - May 31, 2017)

For Pennsylvania Act 129 of 2008

Energy Efficiency and Conservation Plan

Prepared for:



An Exelon Company

Prepared by:

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November 15, 2017
Revised February 28, 2018

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

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ACRONYMS

BDR	Behavioral Demand Response
C&I	Commercial and Industrial
CAP	Customer Assistance Program
CDO	Commercial Date of Operation
CFL	Compact Fluorescent Lamp
CfP	Call for Projects
CHP	Combined Heat and Power
CSP	Conservation Service Provider or Curtailment Service Provider
CV	Coefficient of Variation
DLC	Direct Load Control
DR	Demand Response
DRA	Demand Response Aggregator
EDC	Electric Distribution Company
EDT	Eastern Daylight Time
EE&C	Energy Efficiency and Conservation
EEMF	Energy Efficiency Marketing Firm
EM&V	Evaluation, Measurement, and Verification
EUL	Effective Useful Life
FPL	Federal Poverty Level
G/E/NP	Government/Education/Non-Profit
GIS	Geographic Information Systems
HER	Home Energy Report
HIM	High Impact Measure
HVAC	Heating, Ventilating, and Air Conditioning
ICSP	Implementation Conservation Service Provider
ISR	In-Service Rate
kW	Kilowatt
kWh	Kilowatt-hour
LDV	Lagged Dependent Variable
LED	Light-Emitting Diode
LEEP	Low-Income Energy Efficiency Program (Phase II)
LIURP	Low-Income Usage Reduction Program
M&V	Measurement and Verification
MW	Megawatt
MWh	Megawatt-hour
NPV	Net Present Value
NTG	Net-to-Gross
P3TD	Phase III to Date

PA PUC	Pennsylvania Public Utility Commission
PSA	Phase III to Date Preliminary Savings Achieved; equal to VTD + PYRTD
PSA+CO	PSA savings plus Carryover from Phase II
PSD	Performance Systems Development
PUF	Part-Use Factor
PY	Program Year: e.g. PY8, from June 1, 2016, to May 31, 2017
PYRTD	Program Year Reported to Date
PYVTD	Program Year Verified to Date
RCT	Randomized Controlled Trial
RPPM	Regression with Pre-Program Matching
RR	Realization Rate
RTD	Phase III to Date Reported Gross Savings
RTO	Regional Transmission Organization
RUL	Remaining Useful Lifetime
SIDS	Smart Ideas Data System
SWE	Statewide Evaluator
TRC	Total Resource Cost
TRM	Technical Reference Manual
VFD	Variable Frequency Drive
VTD	Phase III to Date Verified Gross Savings

TYPES OF SAVINGS

Gross Savings: The change in energy consumption and/or peak demand that results directly from program-related actions taken by participants in an Energy Efficiency and Conservation (EE&C) program, regardless of why they participated.

Net Savings: The total change in energy consumption and/or peak demand that is attributable to an EE&C program. Depending on the program delivery model and evaluation methodology, the net savings estimates may differ from the gross savings estimate due to adjustments for the effects of free riders, changes in codes and standards, market effects, participant and nonparticipant spillover, and other causes of changes in energy consumption or demand not directly attributable to the EE&C program.

Reported Gross: Also referred to as ex ante (Latin for "beforehand") savings. The energy and peak demand savings values calculated by the Electric Distribution Company (EDC) or its program Implementation Conservation Service Providers (ICSPs) and stored in the program tracking system.

Unverified Reported Gross: The Phase III Evaluation Framework allows EDCs and the evaluation contractors the flexibility to not evaluate each program every year. If an EE&C program is being evaluated over a multiyear cycle, the reported savings for a program year where evaluated results are not available are characterized as unverified reported gross until the impact evaluation is completed and verified savings can be calculated and reported.

Verified Gross: Also referred to as ex post (Latin for “from something done afterward”) gross savings. The energy and peak demand savings estimates reported by the independent evaluation contractor after the gross impact evaluation and associated measurement and verification (M&V) efforts have been completed.

Verified Net: Also referred to as ex post net savings. The energy and peak demand savings estimates reported by the independent evaluation contractor after applying the results of the net impact evaluation. Typically calculated by multiplying the verified gross savings by a net-to-gross (NTG) ratio.

Annual Savings: Energy and demand savings expressed on an annual basis, or the amount of energy and/or peak demand an EE&C measure or program can be expected to save over the course of a typical year. Annualized savings are noted as MWh/year or MW/year. The Pennsylvania Technical Reference Manual (TRM) provides algorithms and assumptions to calculate annual savings, and Act 129 compliance targets for consumption reduction are based on the sum of the annual savings estimates of installed measures or behavior change.

Lifetime Savings: Energy and demand savings expressed in terms of the total expected savings over the useful life of the measure. Typically calculated by multiplying the annual savings of a measure by its effective useful life. The Total Resource Cost (TRC) Test uses savings from the full lifetime of a measure to calculate the cost-effectiveness of EE&C programs.

Program Year Reported to Date (PYRTD): The reported gross energy and peak demand savings achieved by an EE&C program or portfolio within the current program year. PYTD values for energy efficiency will always be reported gross savings in a semiannual or preliminary annual report.

Program Year Verified to Date (PYVTD): The verified gross energy and peak demand savings achieved by an EE&C program or portfolio within the current program year as determined by the impact evaluation findings of the independent evaluation contractor.

Phase III to Date (P3TD): The energy and peak demand savings achieved by an EE&C program or portfolio within Phase III of Act 129. Reported in several permutations described below.

1. **Phase III to Date Reported (RTD):** The sum of the reported gross savings recorded to date in Phase III of Act 129 for an EE&C program or portfolio.
2. **Phase III to Date Verified (VTD):** The sum of the verified gross savings recorded to date in Phase III of Act 129 for an EE&C program or portfolio, as determined by the impact evaluation finding of the independent evaluation contractor.
3. **Phase III to Date Preliminary Savings Achieved (PSA):** The sum of the verified gross savings (VTD) from previous program years in Phase III where the impact evaluation is complete plus the reported gross savings from the current program year (PYTD). For PY8, the PSA savings will always equal the PYTD savings because PY8 is the first program year of the phase (no savings will be verified until the PY8 final annual report).
4. **Phase III to Date Preliminary Savings Achieved + Carryover (PSA+CO):** The sum of the verified gross savings from previous program years in Phase III plus the reported gross savings from the current program year plus any verified gross carryover savings from Phase II of Act 129. This is the best estimate of an EDC’s progress toward the Phase III compliance targets.

- 5. Phase III to Date Verified + Carryover (VTD + CO):** The sum of the verified gross savings recorded to date in Phase III plus any verified gross carryover savings from Phase II of Act 129.

1. INTRODUCTION

Pennsylvania Act 129 of 2008, signed on October 15, 2008, mandated energy savings and demand reduction goals for the largest electric distribution companies (EDCs) in Pennsylvania for Phase I (2008 through 2013), Phase II of Act 129 began in 2013 and concluded in 2016. In late 2015, each EDC filed a new energy efficiency and conservation (EE&C) plan with the Pennsylvania Public Utilities Commission (PA PUC) detailing the proposed design of its portfolio for Phase III. These plans were updated based on stakeholder input and subsequently approved by the PUC in 2016.

Implementation of Phase III of the Act 129 programs began on June 1, 2016. This report documents the progress and effectiveness of the Phase III EE&C accomplishments for PECO in Program Year 8 (PY8), as well as the cumulative accomplishments of the Phase III programs since inception. This report additionally documents the energy savings carried over from Phase II. The Phase II carryover savings count toward EDC savings compliance targets for Phase III.

This report details the participation, spending, reported gross, verified gross, and verified net impacts of the energy efficiency (EE) programs in PY8. Compliance with Act 129 savings goals are ultimately based on verified gross savings. This report also includes estimates of cost-effectiveness accorded to the Total Resource Cost (TRC) test.¹ PECO has retained Navigant Consulting, Inc. (Navigant) as an independent evaluation contractor for Phase III of Act 129. Navigant is responsible for the measurement and verification (M&V) of the savings and calculation of gross verified and net verified savings.

Navigant also performed a process evaluation to examine the design, administration, implementation, and market response to the EE&C programs. This report presents the key findings and recommendations identified by the process evaluation and documents any changes to EE&C program delivery considered based on the recommendations.

Phase III of Act 129 includes a demand response (DR) goal for PECO. DR events are limited to the months of June through September, which are the first 4 months of the Act 129 PY. Because the DR season is completed early in the PY, it is possible to complete the independent evaluation of verified gross savings for DR sooner than for the energy efficiency programs. PECO reported the verified gross demand response impacts for PY8 as well as the cumulative DR performance of the EE&C program to date for Phase III of Act 129 in the Preliminary Annual Report filed July 17, 2017. Sections 3.6, 3.7, and 3.8 of this report also include PECO's previously reported DR performance results for PY8.

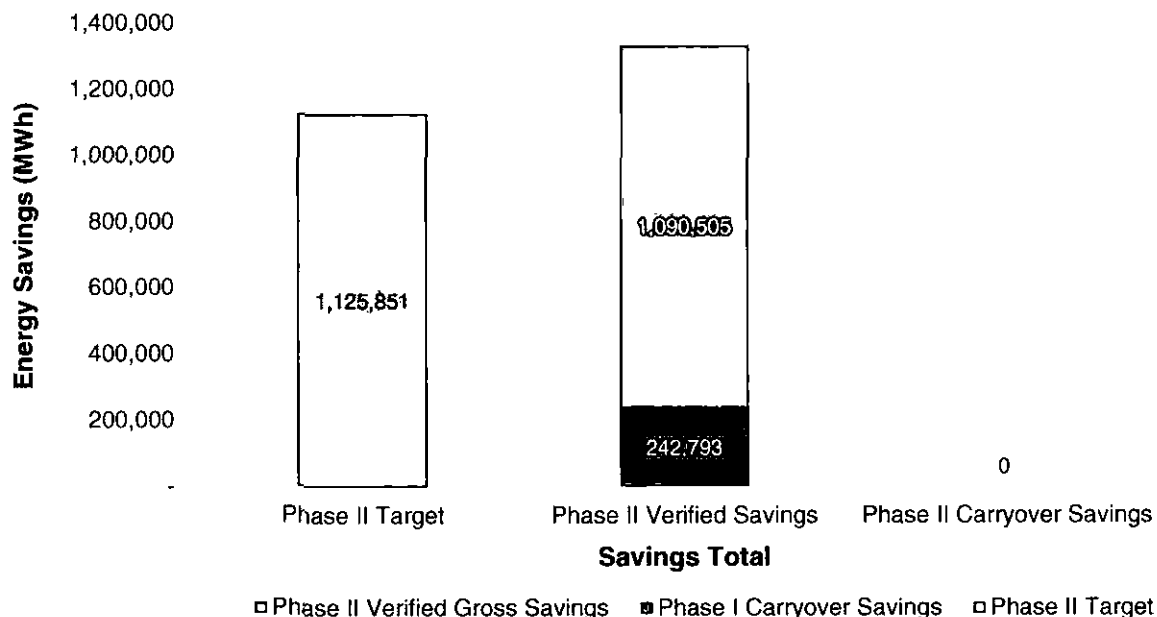
¹ The Pennsylvania TRC Test for Phase I was adopted by PUC order at Docket No. M-2009-2108601 on June 23, 2009 (*2009 PA TRC Test Order*). The TRC Test Order for Phase I later was refined in the same docket on August 2, 2011 (*2011 PA TRC Test Order*). The 2013 TRC Order for Phase II of Act 129 was issued on August 30, 2012. The 2016 TRC Test Order for Phase III of Act 129 was adopted by PUC order at Docket No. M-2015-2468992 on June 11, 2015.

2. SUMMARY OF ACHIEVEMENTS

2.1 Carryover Savings from Phase II of Act 129

PECO has reported zero portfolio-level carryover savings from Phase II to Phase III. The Commission's Phase III Implementation Order² allowed EDCs to carry over savings achieved within Phase II that were in excess of the Phase II portfolio savings target. Phase I carryover savings cannot be counted in calculation of Phase II carryover savings. Figure 2-1 compares PECO's Phase II verified gross savings total to the Phase II compliance target to illustrate the carryover calculation. Because PECO's Phase II verified gross savings did not exceed PECO's Phase II target, they were not eligible to carry over savings from Phase II toward their Phase III overall compliance target.³

Figure 2-1. Carryover Savings from Phase II of Act 129



Sources: Smart Ideas Data System (SIDS) database, Conservation Service Provider (CSP) tracking data

The Commission's Phase III Implementation Order⁴ also allowed EDCs to carry over savings in excess of the Phase II government, educational, and non-profit (G/E/NP) savings goal and excess savings from the

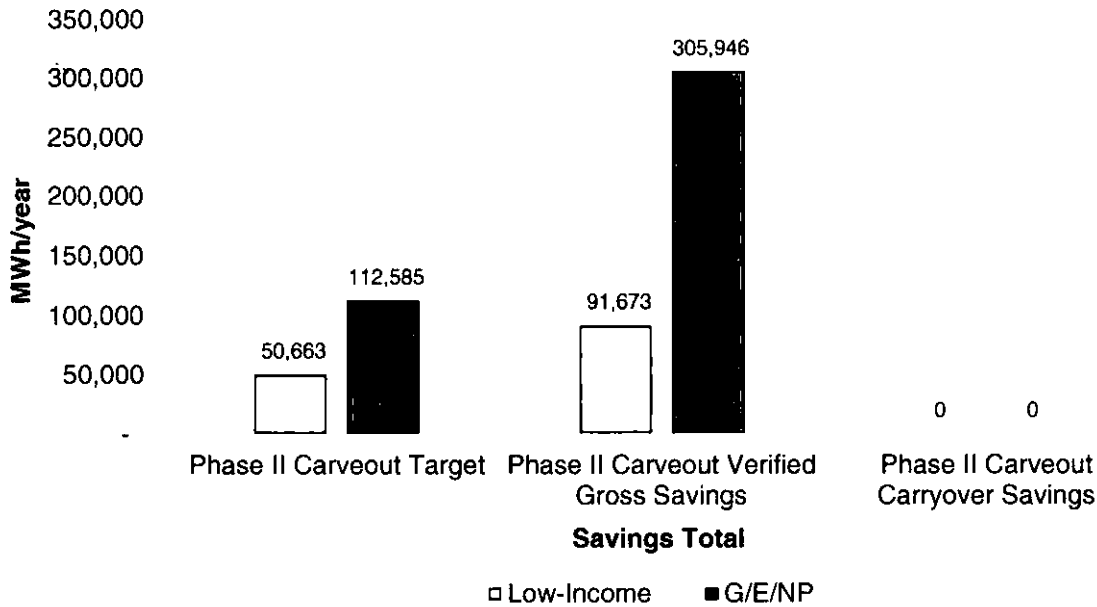
² Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Implementation Order*, at Docket No. M-2014-2424864, (*Phase III Implementation Order*), entered June 11, 2015.

³ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Compliance Order*, at Docket No. M-2012-2289411, (*Phase II Compliance Determination Order*), entered August 3, 2017.

⁴ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Implementation Order*, at Docket No. M-2014-2424864, (*Phase III Implementation Order*), entered June 11, 2015.

low-income customer segment.⁵ PECO carried over 0 MWh of G/E/NP and 0 MWh of low-income customer segment savings.⁶ Figure 2-2 shows the calculation of carryover savings for the low-income and G/E/NP targets.⁷

Figure 2-2. Customer Segment-Specific Carryover from Phase II



Sources: SIDS database, CSP tracking data

2.2 Phase III Energy Efficiency Achievements to Date

Since the beginning of PY8 on June 1, 2016, PECO has claimed:

- 211,532.1 MWh of reported gross electric energy savings (PYRTD)
- 20.79 MW of reported gross peak demand savings (PYRTD) from energy efficiency programs
- 210,688.5 MWh of verified gross electric energy savings (PYVTD)
- 28.64 MW of verified gross peak demand savings (PYVTD) from energy efficiency programs

Since the beginning of Phase III of Act 129 on June 1, 2016, PECO has achieved:

- 211,532.1 MWh of reported gross electric energy savings (RTD)
- 20.79 MW of reported gross peak demand savings (RTD) from energy efficiency programs
- 210,688.5 MWh of verified gross electric energy savings (VTD)

⁵ Proportionate to those savings achieved by dedicated low-income programs in Phase III.

⁶ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Compliance Order*, at Docket No. M-2012-2289411, (*Phase II Compliance Determination Order*), entered August 3, 2017.

⁷ *Ibid.*

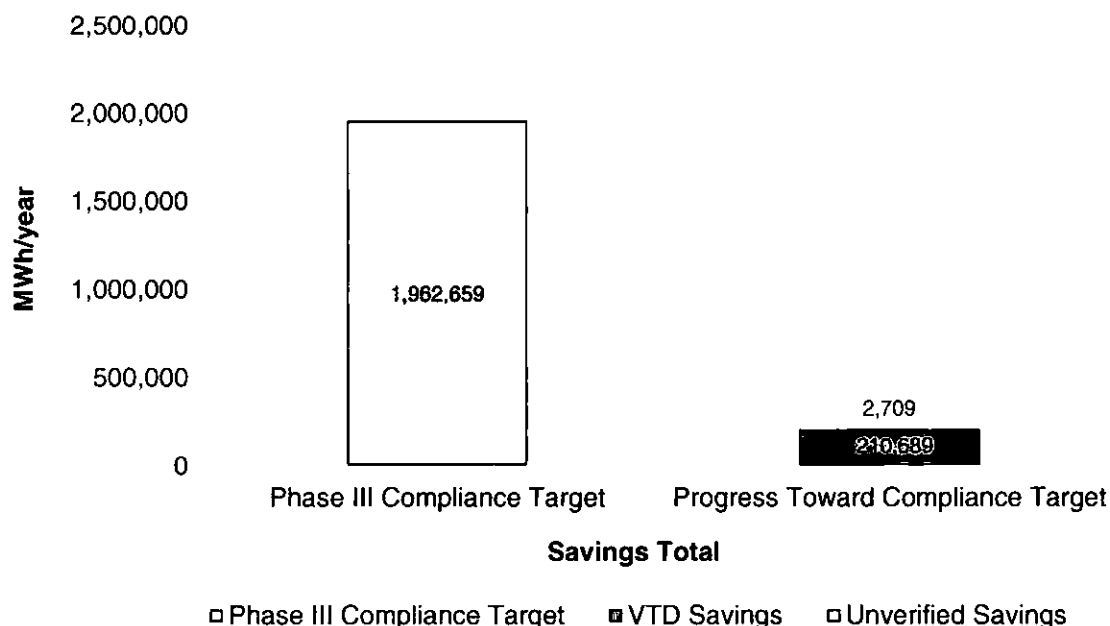
- 28.64 MW of verified gross peak demand savings (VTD) from energy efficiency programs

Including carryover savings from Phase II, PECO has achieved:

- 210,688.5 MWh of VTD + portfolio-level CO energy savings
 - This represents 10.7% of the May 31, 2021 energy savings compliance target of 1,962,659 MWh

Figure 2-3 summarizes PECO's progress toward the Phase III portfolio compliance target. The reader should note that the Whole Home Solution within the Residential Energy Efficiency Program is undergoing a 2-year evaluation across the combined participation from PY8 and PY9. Reported PY8 savings for this solution are being carried in this report as unverified savings. The combined PY8 and PY9 evaluation will result in total verified savings for the 2-year period ending in and reported during PY9. PY9 verified savings will be adjusted to incorporate the impact evaluation and net to gross (NTG) results for the combined period. Appendix D includes details on the Residential Whole Home Solution evaluation.

Figure 2-3. EE&C Plan Performance Toward Phase III Portfolio Compliance Target



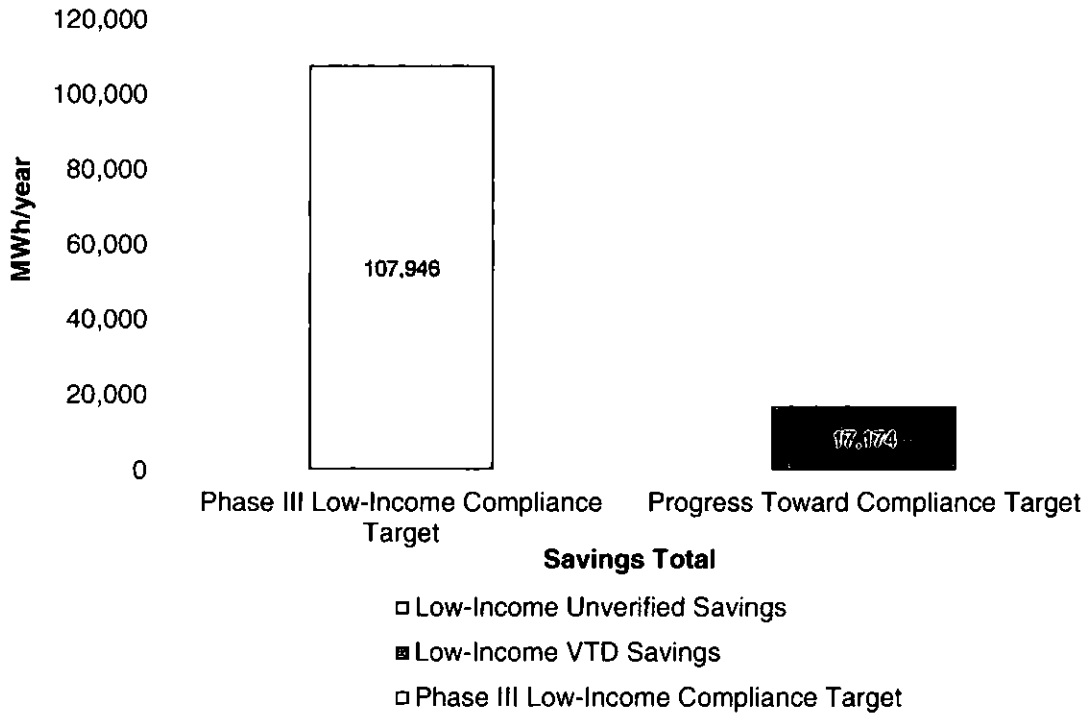
Source: Navigant analysis

The Phase III Implementation Order directed EDCs to offer conservation measures to the low-income customer segment based on the proportion of electric sales attributable to low-income households. The proportionate number of measures targeted for PECO is 8.8%. PECO offers a total of 269 EE&C measures to its residential and non-residential customer classes. There are 117 measures available to the low-income customer segment at no cost to the customer. This represents 43.5% of the total measures offered in the EE&C Plan and exceeds the proportionate number of measures targeted.

The PA PUC also established a low-income energy savings target of 5.5% of the portfolio savings goal. The low-income savings target for PECO is 107,946 MWh/yr and is based on verified gross savings.

Figure 2-4 compares the VTD performance for the low-income customer segment to the Phase III savings target. Based on the latest available information, PECO has achieved 15.9% of the Phase III low-income energy savings target.

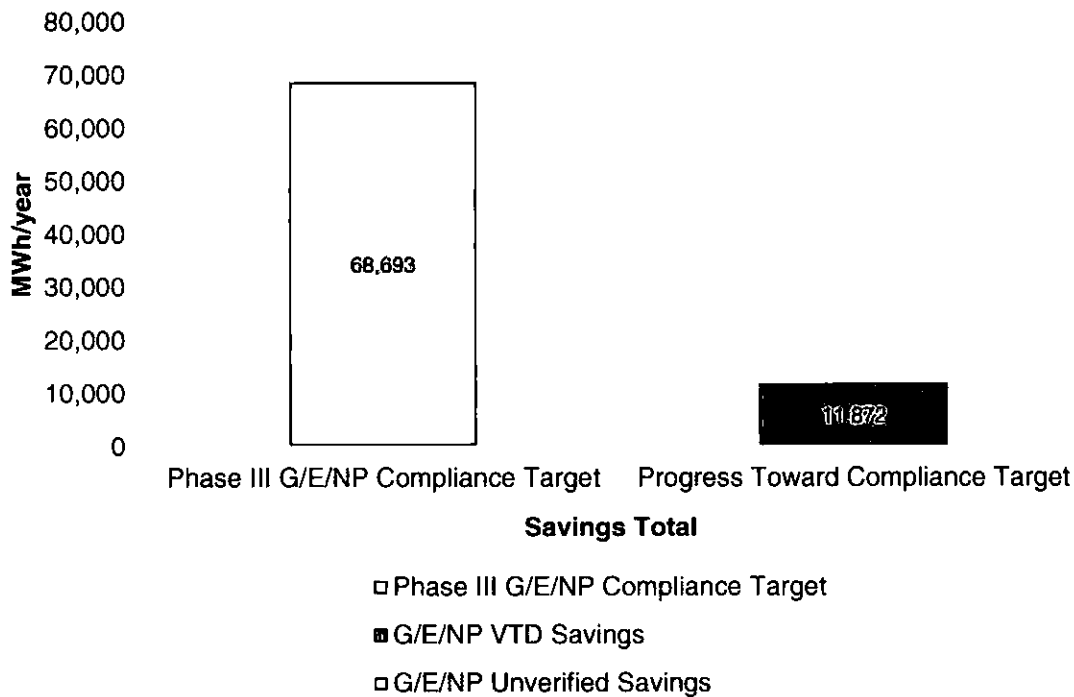
Figure 2-4. EE&C Plan Performance Toward Phase III Low-Income Compliance Target



Source: Navigant analysis

The Phase III Implementation Order established a G/E/NP energy savings target of 3.5% of the portfolio savings goal. The G/E/NP savings target for PECO is 68,693 MWh/yr and is based on verified gross savings. Figure 2-5 compares the VTD performance for the G/E/NP customer segment to the Phase III savings target. Based on the latest available information, PECO has achieved 17.3% of the Phase III G/E/NP energy savings target.

Figure 2-5. EE&C Plan Performance Against Phase III G/E/NP Compliance Target



Source: Navigant analysis

2.3 Phase III DR Achievements to Date

The Phase III DR performance target for PECO is 161 MW. Compliance targets for DR programs are based on average performance across events and are established at the system level, which means the load reductions measured at the customer meter must be escalated to reflect transmission and distribution losses.

Act 129 DR events are triggered by PJM’s day-ahead load forecast. When the day-ahead forecast is above 96% of the peak load forecast for the year, a DR event is initiated for the following day.

Phase III DR programs will begin operating in PY9. Their performance targets and achievements will be reported in this section of next year’s report.

2.4 Phase III Performance by Customer Segment

Table 2-1 through Table 2-3 present the participation, savings, and spending results by customer sector for PY8. The residential, small C&I, and large C&I sectors (also referred to as customer segments or rate classes) are defined by EDC tariff, and the residential low-income and G/E/NP customer segments (Table 2-4 through Table 2-6) were defined by statute (66 Pa. C.S. § 2806.1). The residential low-income segment is primarily a subset of the residential customer class; however, it also includes low-income-qualified residents in master-metered buildings in the small C&I and large C&I sectors. The G/E/NP segment is a subset of the small C&I and large C&I sectors.

Table 2-1 provides the participation counts and spending totals for PECO's EE programs for the three sectors: residential, small C&I, and large C&I, inclusive of all low-income and G/E/NP segments.

Table 2-1. Summary Statistics for EE Programs by Customer Segment

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Residential	1,185,035	-	-	-	-	1,185,035
	Small C&I	880	-	-	-	-	880
	Large C&I	170	-	-	-	-	170
	Total	1,186,085	-	-	-	-	1,186,085
Incentive Spending (\$1,000)	Residential	5,018	-	-	-	-	5,018
	Small C&I	657	-	-	-	-	657
	Large C&I	1,014	-	-	-	-	1,014
	Total	6,689	-	-	-	-	6,689

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-2 provides a summary of reported and verified energy savings for PECO's EE programs across the three sectors.

Table 2-2. Summary of Energy Savings for EE Programs by Customer Segment^a

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Energy Savings (MWh)	Residential	167,460.1	-	-	-	-	167,460.1
	Small C&I	18,102.9	-	-	-	-	18,102.9
	Large C&I	25,969.0	-	-	-	-	25,969.0
	Total	211,532.1	-	-	-	-	211,532.1
Verified Gross Energy Savings (MWh)	Residential	163,795.3	-	-	-	-	163,795.3
	Small C&I	20,924.5	-	-	-	-	20,924.5
	Large C&I	25,968.8	-	-	-	-	25,968.8
	Total	210,688.5	-	-	-	-	210,688.5
Energy Savings Realization Rate	Residential	0.98	-	-	-	-	0.98
	Small C&I	1.16	-	-	-	-	1.16
	Large C&I	1.00	-	-	-	-	1.00
	Total	1.00	-	-	-	-	1.00

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

^a Verified gross energy savings and realization rates do not include the unverified savings from the Whole Home Solution within the Residential EE Program. Verified solution savings will be reflected in the PY9 Annual Compliance Report upon completion of the 2-year evaluation.

Table 2-3 provides a summary of reported and verified demand savings for PECO's EE programs across the three sectors.

Table 2-3. Summary of Demand Savings for EE Programs by Customer Segment⁹

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Demand Savings (MW)	Residential	13.89	-	-	-	-	13.89
	Small C&I	2.98	-	-	-	-	2.98
	Large C&I	3.92	-	-	-	-	3.92
	Total	20.79	-	-	-	-	20.79
Verified Gross Demand Savings (MW)	Residential	21.14	-	-	-	-	21.14
	Small C&I	3.55	-	-	-	-	3.55
	Large C&I	3.94	-	-	-	-	3.94
	Total	28.64	-	-	-	-	28.64
Demand Savings Realization Rate	Residential	1.52	-	-	-	-	1.52
	Small C&I	1.19	-	-	-	-	1.19
	Large C&I	1.01	-	-	-	-	1.01
	Total	1.38	-	-	-	-	1.38

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-4 provides a summary of participation and incentive spending for PECO's EE programs by customer segment carve-out.

Table 2-4. Summary Statistics for EE Programs by Carve-Out

Parameter	Carve-Out	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Low-Income	64,385	-	-	-	-	64,385
	G/E/NP	86	-	-	-	-	86
Incentive Spending (\$1,000)	Low-Income	350	-	-	-	-	350
	G/E/NP	555	-	-	-	-	555

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

⁹ Ibid.

Table 2-5 provides a summary of reported and verified energy savings for PECO's EE programs by customer segment carve-out.

Table 2-5. Summary of Energy Savings for EE Programs by Carve-Out

Parameter	Carve-Out	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Energy Savings (MWh)	Low-Income	19,864.8	-	-	-	-	19,864.8
	G/E/NP	11,864.6	-	-	-	-	11,864.6
Verified Gross Energy Savings (MWh)	Low-Income	17,173.9	-	-	-	-	17,173.9
	G/E/NP	11,871.9	-	-	-	-	11,871.9
Energy Savings Realization Rate	Low-Income	0.86	-	-	-	-	0.86
	G/E/NP	1.00	-	-	-	-	1.00

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-6 provides a summary of reported and verified demand savings for PECO's EE programs by customer segment carve-out.

Table 2-6. Summary of Demand Savings for EE Programs by Carve-Out

Parameter	Carve-Out	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Demand Savings (MW)	Low-Income	2.23	-	-	-	-	2.23
	G/E/NP	1.88	-	-	-	-	1.88
Verified Gross Demand Savings (MW)	Low-Income	1.91	-	-	-	-	1.91
	G/E/NP	1.86	-	-	-	-	1.86
Demand Savings Realization Rate	Low-Income	0.85	-	-	-	-	0.85
	G/E/NP	0.99	-	-	-	-	0.99

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-7 summarizes the participation and spending for the DR program for the three sectors.

Table 2-7. Summary Statistics for DR Programs by Customer Segment

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Residential	61,440	-	-	-	-	61,440
	Small C&I	1,586	-	-	-	-	1,586
	Large C&I	N/A	-	-	-	-	N/A
	Total	63,026	-	-	-	-	63,026
Incentive Spending (\$1,000)	Residential	3,005	-	-	-	-	3,005
	Small C&I	122	-	-	-	-	122
	Large C&I	N/A	-	-	-	-	N/A
	Total	3,127	-	-	-	-	3,127

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

There are no reported savings for DR programs in PY8.

2.5 Summary of Participation by Program

Participation is defined differently for each program depending on the program delivery channel and data tracking practices. Table 2-8 provides the current participation totals by program for each program year and for Phase III to date. Solution-level participation is captured in Appendix I.

Table 2-8. EE&C Portfolio Participation by Program

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Residential EE	1,120,885	-	-	-	-	1,120,885
	Low-Income EE	64,385	-	-	-	-	64,385
	Small C&I EE	656	-	-	-	-	656
	Large C&I EE	159	-	-	-	-	159
	CHP	0	-	-	-	-	0
	Residential DR	61,440	-	-	-	-	61,440
	Small C&I DR	1,586	-	-	-	-	1,586
	Large C&I DR	0	-	-	-	-	0
	Portfolio Total	1,249,111	-	-	-	-	1,249,111

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

The nuances of the participant definition vary by program or solution, and are summarized by program and solution as described here.

Residential EE Program

Five solutions and one targeted market segment make up the Residential EE Program: the Lighting, Appliances & HVAC Solution; the Appliance Recycling Solution; the Whole Home Solution; the New Construction Solution; the Behavioral Solution; and the Multifamily Targeted Market Segment. PECO defined participation counts in each solution as follows:

- For the Lighting, Appliances & HVAC Solution, upstream lighting participation is defined as the sum of stock keeping unit (SKU) sales. A SKU describes a sold lighting product that can be a single bulb or a multi-pack of bulbs. For appliance and HVAC participants, participation is defined as the total number of non-adjusted records in PECO's tracking data. A record may represent one or more rebated items (e.g., a single participant purchasing multiple thermostats during the same purchase event) as is roughly equivalent to all measures included on a single customer application.
- For the Appliance Recycling Solution, a participant is defined as a customer who schedules a pickup for one or more units. If the same customer initiates multiple pickup orders during the year, each order is counted as an individual participant. However, if a customer initiates more than one order in the same day it counts as a single participant.
- For the Residential Whole Home Solution, a participant is defined as a unique customer project listed in the database. In practice within the tracking system, this is equivalent to a project number for non-adjusted records with a project type that does not include "Other Installations" or "CAC Other Installations."
- For the Residential New Construction Solution, a participant is defined as a new home.
- For the Behavioral Solution, a participant is defined as a utility account included in the program's treatment group.
- For the Multifamily Targeted Market Segment, a participant is defined as a unique customer project. This is determined by identifying unique project numbers within the tracking data.

Low-Income EE Program

Two solutions make up the Low-Income EE Program: the Lighting Solution and the Whole Home Solution. Low-income participants are those participants with incomes at or below 150% of the Federal Poverty Level (FPL). PECO defined participation counts in each solution as follows:

- For the Lighting Solution, participation is defined as a package of one or more light bulbs identified by a unique SKU¹⁰ number.
- For the Low-Income Whole Home Solution, a participant is defined as the following:
 - A unique audit number (for both multifamily and single-family audits).
 - A low-income appliance recycling customer who schedules a pickup for one or more units. If the same customer initiates multiple pickup orders during the year, each order is counted as an individual participant. However, if a customer initiates more than one order in the same day it counts as a single participant.
 - Product giveaways are also part of the Whole Home Solution but are not included in the participant count.

¹⁰ A SKU describes a sold lighting product that can be a single bulb or a multi-pack of bulbs.

Small C&I EE Program

Four solutions and two targeted market segments make up the Small C&I EE Program: the Equipment and Systems Solution, the Whole Building Solution, the Behavioral Solution, the New Construction Solution, the Data Centers Targeted Market Segment, and the Multifamily Targeted Market Segment. The Behavioral Solution is not currently active. PECO defined participation counts in each active solution as follows:

- For the Small C&I Equipment and Systems Solution, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Small C&I Whole Building Solution, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Small C&I New Construction Solution, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Data Centers Targeted Market Segment, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Multifamily Targeted Market Segment, participation is defined as an activity with a unique account ID (meter number). More than one measure per participant is permitted, with the impact sample defined on the meter level.

Large C&I EE Program

Two solutions and two targeted market segments make up the Large C&I EE Program: the Equipment and Systems Solution, the New Construction Solution, the Data Centers Targeted Market Segment, and the Multifamily Targeted Market Segment. PECO defined participation counts in each solution as follows:

- For the Large C&I Equipment and Systems Solution, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Large C&I New Construction Solution, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Data Centers Targeted Market Segment, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.
- For the Multifamily Targeted Market Segment, participation is defined as an activity with a unique project number. More than one measure per participant is permitted, with the impact sample defined on the project level.

CHP Program

The CHP Program consists of the CHP Solution only. PECO defined participation counts in the solution as follows:

- For CHP, participation is defined as an activity with a unique project number.

Residential DR Program

Three solutions make up the Residential DR Program; however, only the DLC Solution is currently active. PECO defined participation counts in the solution as follows:

- For Residential DLC, a participant is defined as a unique account number where device status is install or swap, and the measure code is CACS (central air conditioner switch). One participant may have more than one direct load control (DLC) device installed at the home. The categories not included in the participant count include disconnect, opt-out, and removal.

Small C&I DR Program

The Small C&I DR Program consists of the Small C&I DLC Solution. PECO defined participation counts in the solution as follows:

- For Small C&I DLC, a participant is defined as a unique account number where device status is install or swap, and the measure code is PCT (program controlled thermostat). One participant may have more than one DLC device installed on the premise. The categories not included in the participant count include disconnect, opt-out, and removal.

2.6 Summary of Impact Evaluation Results

During PY8, Navigant completed impact evaluations for many of the EE programs in the portfolio. Table 2-9 summarizes the realization rates (RRs) and NTG ratios by program or evaluation initiative.

Table 2-9. Impact Evaluation Results Summary¹¹

Program Name	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Residential EE	Energy RR	1.00	-	-	-	-	1.00
	Demand RR	1.69	-	-	-	-	1.69
	NTG Ratio	0.70	-	-	-	-	0.70
Low-Income EE	Energy RR	0.98	-	-	-	-	0.98
	Demand RR	0.97	-	-	-	-	0.97
	NTG Ratio	1.00	-	-	-	-	1.00
Small C&I EE	Energy RR	0.96	-	-	-	-	0.96
	Demand RR	0.94	-	-	-	-	0.94
	NTG Ratio	0.75	-	-	-	-	0.75
Large C&I EE	Energy RR	1.00	-	-	-	-	1.00
	Demand RR	1.01	-	-	-	-	1.01
	NTG Ratio	0.64	-	-	-	-	0.64
CHP	Energy RR	N/A	-	-	-	-	N/A
	Demand RR	N/A	-	-	-	-	N/A

¹¹ Results at the program and portfolio level are drawn slightly downward due to the unverified savings from the Whole Home Solution within the Residential EE Program. Verified solution savings will be reflected in the PY9 Annual Compliance Report upon completion of the 2-year evaluation.

Program Name	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Residential DR	NTG Ratio	N/A	-	-	-	-	N/A
	Energy RR	N/A	-	-	-	-	N/A
	Demand RR	N/A	-	-	-	-	N/A
	NTG Ratio	N/A	-	-	-	-	N/A
Small C&I DR	Energy RR	N/A	-	-	-	-	N/A
	Demand RR	N/A	-	-	-	-	N/A
	NTG Ratio	N/A	-	-	-	-	N/A
Large C&I DR	Energy RR	N/A	-	-	-	-	N/A
	Demand RR	N/A	-	-	-	-	N/A
	NTG Ratio	N/A	-	-	-	-	N/A

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Findings from NTG research are not used to adjust compliance savings in Pennsylvania. Instead, NTG research provides directional information for program planning purposes. Table 2-10 presents NTG findings for high impact measures (HIMs) for the Residential EE Program studied in each PY.

Table 2-10. Residential EE Program HIM NTG Summary

Residential EE HIM	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Multifamily: LEDs ⁽¹⁾	Free Ridership	0.19	-	-	-	-	0.19
	Spillover	0.03	-	-	-	-	0.03
	NTG Ratio	0.84	-	-	-	-	0.84
Lighting, Appliances, & HVAC: Heat Pumps	Free Ridership	0.46	-	-	-	-	0.46
	Spillover	0.02	-	-	-	-	0.02
	NTG Ratio	0.56	-	-	-	-	0.56
Lighting, Appliances, & HVAC: Central Air Conditioners	Free Ridership	0.58	-	-	-	-	0.58
	Spillover	0.04	-	-	-	-	0.04
	NTG Ratio	0.45	-	-	-	-	0.45
Lighting, Appliances, & HVAC: High Efficiency Furnace Fan	Free Ridership	0.48	-	-	-	-	0.48
	Spillover	0.02	-	-	-	-	0.02
	NTG Ratio	0.53	-	-	-	-	0.53
Appliance Recycling: Refrigerator Recycling	Free Ridership	0.65	-	-	-	-	0.65
	Spillover	0.00	-	-	-	-	0.00
	NTG Ratio	0.35	-	-	-	-	0.35
Appliance Recycling:	Free Ridership	0.50	-	-	-	-	0.50
	Spillover	0.00	-	-	-	-	0.00

Residential EE HIM	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Freezer Recycling	NTG Ratio	0.50	-	-	-	-	0.50

[1] The NTG estimates provided for LEDs are based on findings from surveys conducted with tenants participating in the Multifamily Targeted Market Segment aligning with guidance provided in Section 3.4.1.4 of the Phase III Evaluation Framework indicating that HIM research should focus on measures in downstream programs only.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-11 presents NTG findings for HIMs for the Small C&I EE Program.

Table 2-11. Small C&I EE Program HIM NTG Summary

Small C&I EE HIM	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Multifamily: LEDs [1]	Free Ridership	0.35	-	-	-	-	0.35
	Spillover	0.00	-	-	-	-	0.00
	NTG Ratio	0.65	-	-	-	-	0.65

[1] The NTG estimates provided for LEDs are based on findings from interviews conducted with landlords participating in the Multifamily Targeted Market Segment aligning with guidance provided in Section 3.4.1.4 of the Phase III Evaluation Framework indicating that HIM research should focus on measures in downstream programs only.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-12 presents NTG findings for HIMs for the Large C&I EE Program.

Table 2-12. Large C&I EE Program HIM NTG Summary

Large C&I EE HIM	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Multifamily: LEDs [1]	Free Ridership	0.35	-	-	-	-	0.35
	Spillover	0.00	-	-	-	-	0.00
	NTG Ratio	0.65	-	-	-	-	0.65

[1] The NTG estimates provided for LEDs are based on findings from interviews conducted with landlords participating in the Multifamily Targeted Market Segment aligning with guidance provided in Section 3.4.1.4 of the Phase III Evaluation Framework indicating that HIM research should focus on measures in downstream programs only.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

2.7 Summary of Energy Impacts by Program

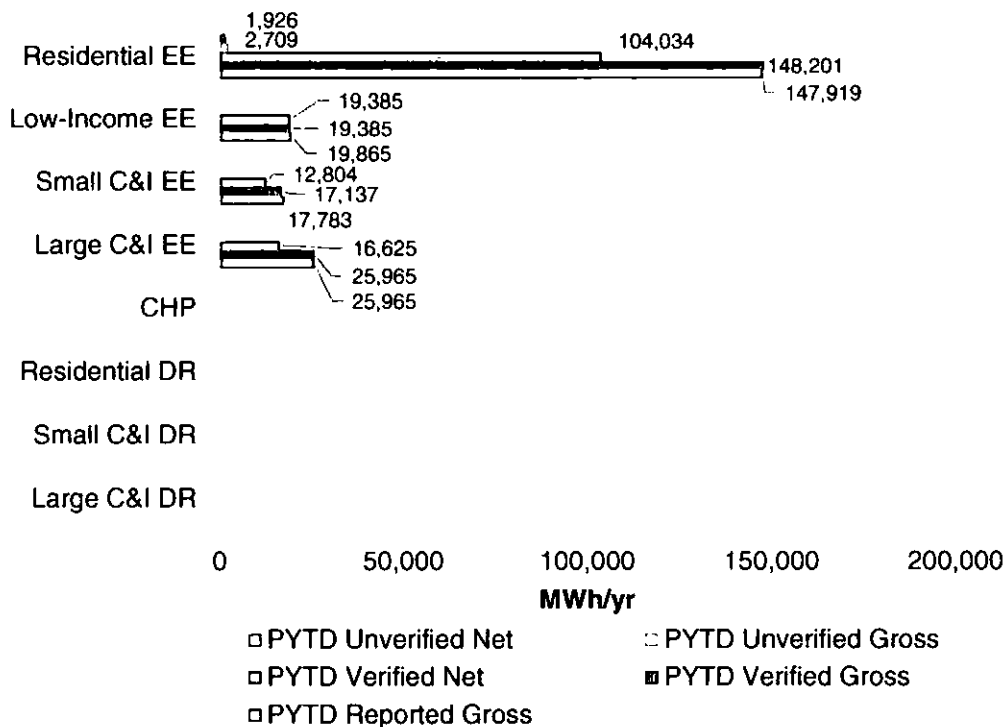
Act 129 compliance targets are based on annualized savings estimates (MWh/year). Each PY, the annual savings achieved by EE&C program activity are recorded as incremental annual—or first-year—savings and are added to an EDC's progress toward compliance. Incremental annual savings estimates are

presented in Section 2.7.1. Lifetime energy savings incorporate the effective useful life (EUL) of installed measures and estimate the total energy savings associated with EE&C program activity. Lifetime savings are used in the TRC test by program participants when assessing the economics of upgrades and by the Statewide Evaluator (SWE) when calculating the emissions benefits of Act 129 programs. Section 2.7.2 presents the lifetime energy savings by program.

2.7.1 Incremental Annual Energy Savings by Program

Figure 2-6 presents a summary of the PYTD energy savings by program for PY8. The energy impacts in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses. The verified gross savings are adjusted by the energy recent RR, and the verified net savings are adjusted by both the RR and the NTG ratio.

Figure 2-6. PYTD Energy Savings by Program¹²

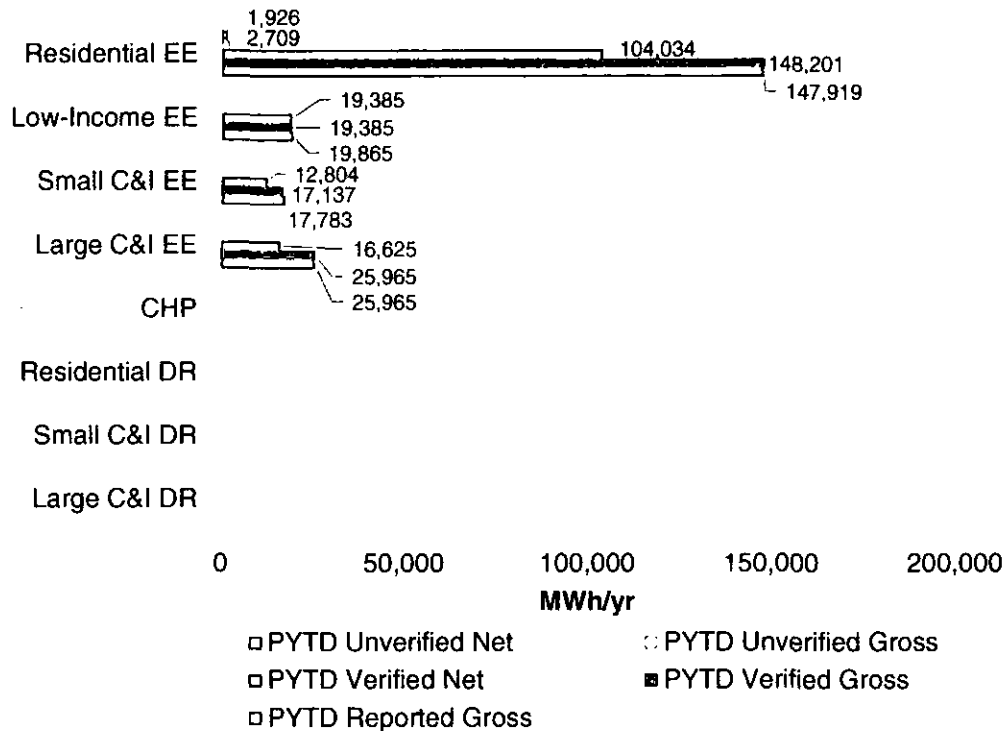


Source: Navigant analysis

Figure 2-7 presents a summary of the energy savings by program for Phase III of Act 129.

¹² Verified gross energy savings do not include the unverified savings from the Whole Home Solution within the Residential EE Program. Verified solution savings will be reflected in the PY9 Annual Compliance Report upon completion of the 2-year evaluation.

Figure 2-7. P3TD Energy Savings by Program¹³



Source: Navigant analysis

A summary of energy impacts by program through PY8 is presented in Table 2-13.

Table 2-13. Summary of Incremental Annual Energy Savings by EE Program¹⁴

Parameter	EE Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Energy Savings (MWh)	Residential EE	147,919.1	-	-	-	-	147,919.1
	Low-Income EE	19,864.8	-	-	-	-	19,864.8
	Small C&I EE	17,782.8	-	-	-	-	17,782.8
	Large C&I EE	25,965.5	-	-	-	-	25,965.5
	CHP	0.0	-	-	-	-	0.0
	Portfolio Total		211,532.1	-	-	-	-
Verified Gross Energy Savings (MWh)	Residential EE	148,201.4	-	-	-	-	148,201.4
	Low-Income EE	19,385.1	-	-	-	-	19,385.1
	Small C&I EE	17,136.6	-	-	-	-	17,136.6
	Large C&I EE	25,965.5	-	-	-	-	25,965.5
	CHP	0.0	-	-	-	-	0.0

¹³ Ibid.

¹⁴ Ibid.

Parameter	EE Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	Portfolio Total	210,688.5	-	-	-	-	210,688.5
Relative Precision of Verified Gross Energy Savings at 90% Confidence Interval	Residential EE	0.01	-	-	-	-	N/A
	Low-Income EE	0.01	-	-	-	-	N/A
	Small C&I EE	0.05	-	-	-	-	N/A
	Large C&I EE	0.09	-	-	-	-	N/A
	CHP	N/A	-	-	-	-	N/A
	Portfolio Total	N/A	-	-	-	-	N/A
Verified Net Energy Savings (MWh)	Residential EE	104,033.6	-	-	-	-	104,033.6
	Low-Income EE	19,385.1	-	-	-	-	19,385.1
	Small C&I EE	12,804.0	-	-	-	-	12,804.0
	Large C&I EE	16,625.3	-	-	-	-	16,625.3
	CHP	0	-	-	-	-	0
	Portfolio Total	152,848.0	-	-	-	-	152,848.0

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

2.7.2 Lifetime Energy Savings by Program

Table 2-14 presents the PYTD and P3TD lifetime energy savings by program. Lifetime energy savings are calculated by multiplying the annual energy savings by the efficient measure useful lifetime (EUL). Per the PA 2016 TRC Order, the measure EUL does not exceed 15 years for any measure in the portfolio. Additionally, early replacement measures are subject to a dual baseline calculation, leading to modified lifetime savings. For these measures, savings relative to the in place baseline equipment are used for the remaining useful lifetime (RUL) of the base equipment. After the RUL, savings relative to code equipment are utilized for the remainder of the efficient measure's EUL.

Table 2-14. Summary of Lifetime Energy Savings by EE Program¹⁵

Parameter	EE Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Verified Gross Lifetime Energy Savings (MWh)	Residential EE	973,710.7	-	-	-	-	973,710.7
	Low-Income EE	141,886.4	-	-	-	-	141,886.4
	Small C&I EE	201,277.1	-	-	-	-	201,277.1
	Large C&I EE	309,580.6	-	-	-	-	309,580.6
	CHP	0	-	-	-	-	0
	Portfolio Total	1,626,454.8	-	-	-	-	1,626,454.8
Verified Net Lifetime	Residential EE	499,256.4	-	-	-	-	499,256.4
	Low-Income EE	141,886.4	-	-	-	-	141,886.4

¹⁵ Ibid.

Parameter	EE Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Energy Savings (MWh)	Small C&I EE	148,552.0	-	-	-	-	148,552.0
	Large C&I EE	196,912.4	-	-	-	-	196,912.4
	CHP	0	-	-	-	-	0
	Portfolio Total	986,607.3	-	-	-	-	986,607.3

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

2.8 Summary of Demand Impacts by Program

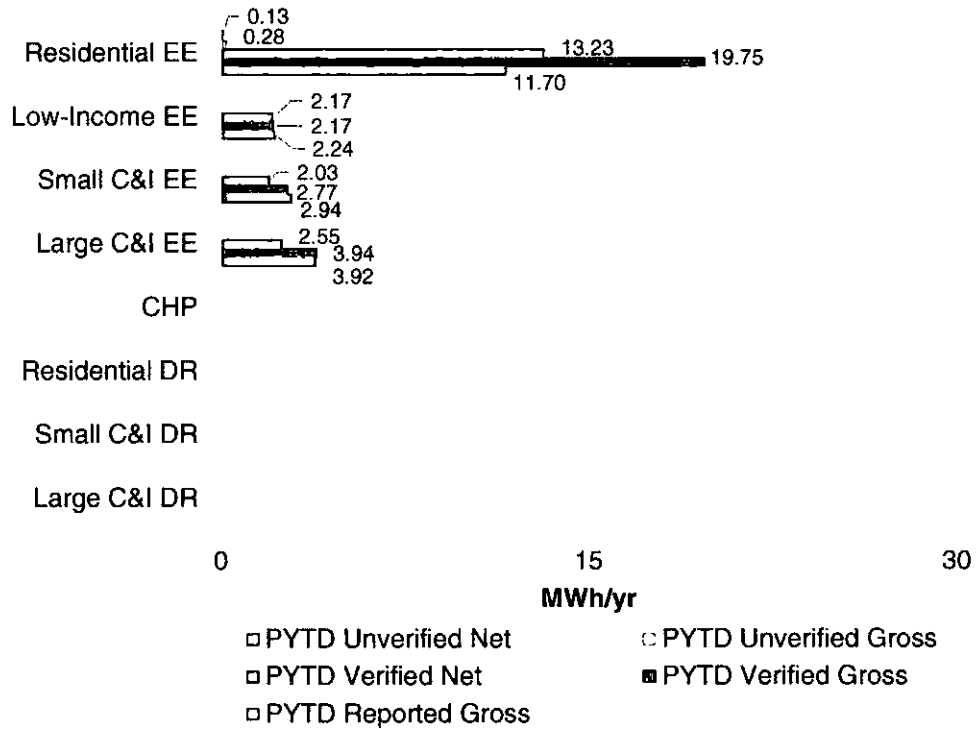
PECO's Phase III EE&C programs achieve peak demand reductions in two primary ways. The first is through coincident reductions from EE measures and the second is through dedicated DR offerings that exclusively target temporary demand reductions on peak days. EE reductions coincident with system peak hours are reported and used in the calculation of benefits in the TRC test but do not contribute to Phase III peak demand reduction compliance goals. Phase III peak demand reduction targets are exclusive to DR programs.

The two types of peak demand reduction savings are also treated differently for reporting purposes. Peak demand reductions from EE are generally additive across program years, meaning that the P3TD savings reflect the sum of the first-year savings in each PY. Conversely, DR goals are based on average portfolio impacts across all events, so cumulative DR performance is expressed as the average performance of each of the DR events called in Phase III to date. Because of these differences, demand impacts from EE and DR are reported separately in the following subsections.

2.8.1 Energy Efficiency

Act 129 defines peak demand savings from EE as the average expected reduction in electric demand from 2:00 p.m. to 6:00 p.m. EDT on non-holiday weekdays from June through August. Unlike Phase I and Phase II Act 129 reporting, the peak demand impacts from EE in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses. Figure 2-8 presents a summary of the PYTD demand savings by EE program for PY8.

Figure 2-8. PYTD Demand Savings by EE Program¹⁶

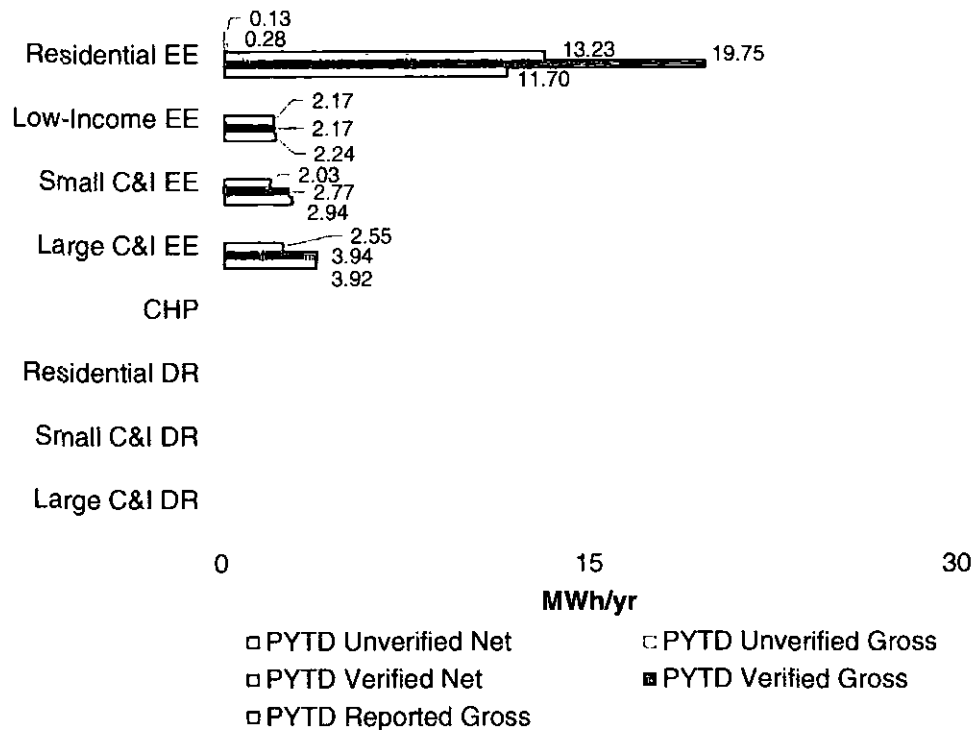


Source: Navigant analysis

Figure 2-9 presents a summary of the P3TD demand savings by EE program for Phase III of Act 129.

¹⁶ Ibid.

Figure 2-9. P3TD Demand Savings by EE Program¹⁷



Source: Navigant analysis

A summary of the peak demand impacts by EE program through the current reporting period are presented in Table 2-15.

Table 2-15. Summary of Demand Savings by EE Program¹⁸

Parameter	EE Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Demand Savings (MW)	Residential EE	11.70	-	-	-	-	11.70
	Low-Income EE	2.24	-	-	-	-	2.24
	Small C&I EE	2.94	-	-	-	-	2.94
	Large C&I EE	3.92	-	-	-	-	3.92
	CHP	0.00	-	-	-	-	0.00
	Portfolio Total	20.79	-	-	-	-	20.78
Verified Gross Demand Savings (MW)	Residential EE	19.75	-	-	-	-	19.75
	Low-Income EE	2.17	-	-	-	-	2.17
	Small C&I EE	2.77	-	-	-	-	2.77
	Large C&I EE	3.94	-	-	-	-	3.94

¹⁷ Ibid.

¹⁸ Ibid.

Parameter	EE Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	CHP	0.00	-	-	-	-	0.00
	Portfolio Total	28.64	-	-	-	-	28.64
Relative Precision of Verified Gross Demand Savings at 90% Confidence Interval	Residential EE	0.02	-	-	-	-	0.02
	Low-Income EE	0.03	-	-	-	-	0.03
	Small C&I EE	0.06	-	-	-	-	0.06
	Large C&I EE	0.10	-	-	-	-	0.10
	CHP	N/A	-	-	-	-	N/A
	Portfolio Total	N/A	-	-	-	-	N/A
Verified Net Demand Savings (MW)	Residential EE	13.23	-	-	-	-	13.23
	Low-Income EE	2.17	-	-	-	-	2.17
	Small C&I EE	2.03	-	-	-	-	2.03
	Large C&I EE	2.55	-	-	-	-	2.55
	CHP	0.00	-	-	-	-	0.00
	Portfolio Total	19.98	-	-	-	-	19.98

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

2.8.2 Demand Response

Act 129 defines peak demand savings from DR as the average reduction in electric demand during the hours when a DR event is initiated. Phase III DR events are initiated according to the following guidelines:

- Curtailment events shall be limited to the months of June through September.
- Curtailment events shall be called for the first 6 days of each program year (starting in PY9) in which the peak hour of PJM's day-ahead forecast for the PJM regional transmission organization (RTO) is greater than 96% of the PJM RTO summer peak demand forecast for the months of June through September.
- Each curtailment event shall last 4 hours.
- Each curtailment event shall be called such that it will occur during the day's forecasted peak hour(s) above 96% of the PJM RTO summer peak demand forecast.
- Once six curtailment events have been called in a PY, the peak demand reduction program shall be suspended for that PY.

Phase III DR programs will begin operating in PY9; therefore, no DR program savings are reported for PY8. The peak demand impacts from DR starting in PY9 will be presented at the system level and reflect

adjustments to account for transmission and distribution losses. PECO uses the following line loss percentages/multipliers by sector.¹⁹

- Residential = 107.99% or 1.0799
- Small C&I = 107.99% or 1.0799
- Large C&I = 107.99% or 1.0799

2.9 Summary of Fuel Switching Impacts

Act 129 allows EDCs to achieve electric savings by converting electric equipment to non-electric equipment. Table 2-16 lists the fuel switching measures offered in each year of Phase III, while Table 2-17 provides the key fuel switching metrics to date.

Table 2-16. List of Fuel Switching Measures

Name of Offered Fuel Switching Measure	Measures Implemented in Program Year (Yes/No)				
	PY8	PY9	PY10	PY11	PY12
Electric Water Heater to Gas Water Heater	Yes	-	-	-	-
Electric Furnace to Gas Furnace	Yes	-	-	-	-
Electric Clothes Dryer to gas Clothes Dryer	Yes	-	-	-	-
Electric Range to Gas Range	Yes	-	-	-	-
ASHP to Gas Furnace	Yes	-	-	-	-
Electric Baseboard to Fossil Fuel Furnace	Yes	-	-	-	-

Source: Navigant analysis

Table 2-17. Summary of Fuel Switching Measure Portfolio Impacts²⁰

Parameter	Program Year					
	PY8	PY9	PY10	PY11	PY12	Phase III to Date
Total Number of Units Implemented	141	-	-	-	-	141
Incentive Spending (\$1,000)	\$44.45	-	-	-	-	\$44.45
Verified Gross Energy Savings (MWh)	95	-	-	-	-	95
Fossil Fuel Consumption Change (MMBtu)	2,318	-	-	-	-	2,318

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

¹⁹ Pennsylvania Public Utility Commission, *Technical Reference Manual; State of Pennsylvania Act 129 Energy Efficiency and Conservation Program & Act 213 Alternative Energy Portfolio Standards*, dated June 2016, errata update February 2017. Section 1.14 Transmission and Distribution System Losses.

²⁰ Verified gross energy savings do not include the unverified savings from the Whole Home Solution within the Residential EE Program. Verified solution savings will be reflected in the PY9 Annual Compliance Report upon completion of the 2-year evaluation.

2.10 Summary of Cost-Effectiveness Results

TRC benefit-cost ratios are calculated by comparing total net present value (NPV) TRC benefits and total NPV TRC costs. It is important to note that TRC costs are materially different from the EDC spending and cost recovery tables presented in Section 4. TRC costs include estimates of the full cost incurred by program participants to install efficient equipment—not just the portion covered by the EDC rebate. Table 2-18 shows the TRC ratios by program and for the portfolio. The benefits in Table 2-18 were calculated using gross verified impacts. Costs and benefits are expressed in 2016 dollars.

Table 2-18. Summary of Gross TRC Results by Program²¹

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
NPV Benefits (\$1,000)	Residential EE	48,391	-	-	-	-	48,391
	Low-Income EE	6,310	-	-	-	-	6,310
	Small C&I EE	8,485	-	-	-	-	8,485
	Large C&I EE	12,450	-	-	-	-	12,450
	CHP	0	-	-	-	-	0
	Residential DR	0	-	-	-	-	0
	Small C&I DR	0	-	-	-	-	0
	Large C&I DR	0	-	-	-	-	0
	Portfolio Total	75,636	-	-	-	-	75,636
NPV Costs (\$1,000)	Residential EE	26,927	-	-	-	-	26,927
	Low-Income EE	7,605	-	-	-	-	7,605
	Small C&I EE	7,805	-	-	-	-	7,805
	Large C&I EE	12,611	-	-	-	-	12,611
	CHP	15	-	-	-	-	15
	Residential DR	3,201	-	-	-	-	3,201
	Small C&I DR	75	-	-	-	-	75
	Large C&I DR	1,742	-	-	-	-	1,742
	Cross-Cutting	8,952	-	-	-	-	8,952
Portfolio Total	68,933	-	-	-	-	68,933	
TRC Ratio	Residential EE	1.80	-	-	-	-	1.80
	Low-Income EE	0.83	-	-	-	-	0.83
	Small C&I EE	1.09	-	-	-	-	1.09
	Large C&I EE	0.99	-	-	-	-	0.99
	CHP	0.00	-	-	-	-	0.00
	Residential DR	0.00	-	-	-	-	0.00
	Small C&I DR	0.00	-	-	-	-	0.00

²¹ NPV Benefits do not include the unverified savings from the Whole Home Solution within the Residential EE Program; however, costs from this solution are included in the NPV Costs. This lowers the Residential EE Program and portfolio TRC values for PY8. Verified solution savings will be reflected in the PY9 Annual Compliance Report upon completion of the 2-year evaluation.

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	Large C&I DR	0.00	-	-	-	-	0.00
	Portfolio Total	1.10	-	-	-	-	1.10
	Residential EE	21,464	-	-	-	-	21,464
	Low-Income EE	-1,295	-	-	-	-	-1,295
	Small C&I EE	680	-	-	-	-	680
Net Benefits (Benefits - Costs) (\$1,000)	Large C&I EE	-161	-	-	-	-	-161
	CHP	-15	-	-	-	-	-15
	Residential DR	-3,201	-	-	-	-	-3,201
	Small C&I DR	-75	-	-	-	-	-75
	Large C&I DR	-1,742	-	-	-	-	-1,742
	Portfolio Total [1]	6,703	-	-	-	-	6,703

[1] The portfolio total net benefits include cross-cutting costs.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-19 presents PY8 cost-effectiveness using net verified savings to calculate benefits.

Table 2-19. Summary of Net TRC Results by Program²²

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	Residential EE	25,013	-	-	-	-	25,013
	Low-Income EE	6,310	-	-	-	-	6,310
	Small C&I EE	6,274	-	-	-	-	6,274
Net Present Value Benefits (\$1,000)	Large C&I EE	7,959	-	-	-	-	7,959
	CHP	0	-	-	-	-	0
	Residential DR	0	-	-	-	-	0
	Small C&I DR	0	-	-	-	-	0
	Large C&I DR	0	-	-	-	-	0
	Portfolio Total	45,556	-	-	-	-	45,556
		Residential EE	20,748	-	-	-	-
	Low-Income EE	7,605	-	-	-	-	7,605
	Small C&I EE	6,536	-	-	-	-	6,536
Net Present Value Costs (\$1,000)	Large C&I EE	10,001	-	-	-	-	10,001
	CHP	15	-	-	-	-	15
	Residential DR	3,201	-	-	-	-	3,201
	Small C&I DR	75	-	-	-	-	75

²² Ibid.

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	Large C&I DR	1,742	-	-	-	-	1,742
	Cross-Cutting	8,952	-	-	-	-	8,952
	Portfolio Total	58,875	-	-	-	-	58,875
TRC Ratio	Residential EE	1.21	-	-	-	-	1.21
	Low-Income EE	0.83	-	-	-	-	0.83
	Small C&I EE	0.96	-	-	-	-	0.96
	Large C&I EE	0.80	-	-	-	-	0.80
	CHP	0.00	-	-	-	-	0.00
	Residential DR	0.00	-	-	-	-	0.00
	Small C&I DR	0.00	-	-	-	-	0.00
	Large C&I DR	0.00	-	-	-	-	0.00
	Portfolio Total	0.77	-	-	-	-	0.77
	Net Benefits (Benefits – Costs) (\$1,000)	Residential EE	4,265	-	-	-	-
Low-Income EE		-1,295	-	-	-	-	-1,295
Small C&I EE		-262	-	-	-	-	-262
Large C&I EE		-2,042	-	-	-	-	-2,042
CHP		-15	-	-	-	-	-15
Residential DR		-3,201	-	-	-	-	-3,201
Small C&I DR		-75	-	-	-	-	-75
Large C&I DR		-1,742	-	-	-	-	-1,742
Portfolio Total [1]	-13,320	-	-	-	-	-13,320	

[1] The portfolio total net benefits include cross-cutting costs.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

2.11 Comparison of Performance to Approved EE&C Plan

Table 2-20 presents P3TD expenditures, by program, compared to the budget estimates set forth in the EE&C Plan through PY8. All dollars in Table 2-20 are presented in 2016 dollars.

Table 2-20. Comparison of Expenditures to Phase III EE&C Plan by Program

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
EE&C Plan Budget (\$1,000)	Residential EE	19,700	19,700	19,900	20,300	20,400	100,100
	Low-Income EE	7,000	7,000	7,100	7,400	7,700	36,100
	Small C&I EE	8,900	9,000	9,000	9,000	8,600	44,500
	Large C&I EE	10,600	10,800	11,000	11,200	11,400	55,100
	CHP	5,300	5,600	5,800	6,100	2,200	24,900

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	Residential DR	2,300	2,700	2,800	2,900	3,000	13,700
	Small C&I DR	200	200	200	200	200	900
	Large C&I DR	200	6,800	6,800	6,700	6,700	27,100
	Cross-Cutting	31,200	23,600	23,200	22,000	25,100	125,000
	Portfolio Total	85,500	85,500	85,500	85,500	85,500	427,400
Actual Expenditures (\$1,000)	Residential EE	20,002	-	-	-	-	20,002
	Low-Income EE	7,015	-	-	-	-	7,015
	Small C&I EE	5,384	-	-	-	-	5,384
	Large C&I EE	5,057	-	-	-	-	5,057
	CHP	15	-	-	-	-	15
	Residential DR	3,953	-	-	-	-	3,953
	Small C&I DR	106	-	-	-	-	106
	Large C&I DR	1,742	-	-	-	-	1,742
	Cross-Cutting	8,952	-	-	-	-	8,952
		Portfolio Total	52,225	-	-	-	-
Ratio (Actual/Planned Spending)	Residential EE	1.02	-	-	-	-	0.20
	Low-Income EE	1.00	-	-	-	-	0.19
	Small C&I EE	0.60	-	-	-	-	0.12
	Large C&I EE	0.47	-	-	-	-	0.09
	CHP	0.00	-	-	-	-	0.00
	Residential DR	1.72	-	-	-	-	0.29
	Small C&I DR	0.53	-	-	-	-	0.12
	Large C&I DR	8.71	-	-	-	-	0.06
	Cross-Cutting	0.28	-	-	-	-	0.00
	Portfolio Total	0.61	-	-	-	-	0.17

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 2-21 compares Phase III verified gross program savings to the energy savings projections filed in the EE&C Plan.

Table 2-21. Comparison of Energy Savings to Phase III EE&C Plan by Program

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
EE&C Plan Verified Gross Energy Savings (MWh)	Residential EE	128,166.0	139,740.0	148,876.0	154,269.0	156,144.0	727,195.0
	Low-Income EE	22,627.0	23,244.0	24,314.0	25,866.0	27,941.0	123,991.0
	Small C&I EE	73,843.0	79,613.0	85,681.0	86,907.0	79,236.0	405,280.0
	Large C&I EE	94,954.0	95,444.0	96,067.0	96,841.0	97,568.0	480,875.0
	CHP	78,710.0	81,806.0	85,057.0	88,471.0	29,490.0	363,534.0

Parameter	Program Name	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
	Portfolio Total	398,299.0	419,848.0	439,995.0	452,355.0	390,378.0	2,100,875.0
Actual Verified Gross Energy Savings (MWh)	Residential EE	148,201.4	-	-	-	-	148,201.4
	Low-Income EE	19,385.1	-	-	-	-	19,385.0
	Small C&I EE	17,136.6	-	-	-	-	17,136.6
	Large C&I EE	25,965.5	-	-	-	-	25,965.5
	CHP	0.0	-	-	-	-	0.0
	Portfolio Total	210,688.5	-	-	-	-	210,688.5
Ratio (Actual/Planned Savings)	Residential EE	1.16	-	-	-	-	0.20
	Low-Income EE	0.86	-	-	-	-	0.16
	Small C&I EE	0.23	-	-	-	-	0.04
	Large C&I EE	0.27	-	-	-	-	0.05
	CHP	0.00	-	-	-	-	0.00
	Portfolio Total	0.53	-	-	-	-	0.10

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

The list below briefly discusses several key reasons why programs exceeded or fell short of projected gross energy savings in PY8.

- The Residential EE Program exceeded its projections due to the Lighting component of the Lighting, HVAC, and Appliance solution, and the Behavior solution. The remaining Residential EE Program solutions did not achieve their projected savings. At the writing of this report, Navigant and PECO are continuing to work through early and ongoing process evaluation results to identify the drivers of these solution-specific shortfalls; this work will stretch into PY9 research. At this time, Navigant is able to report that changes in the Phase III EE&C Plan from Phase II resulted in lags in implementation adjustments and participation rates. For example, changes in the incentive structure for some measures as well as changes in CSP roles resulted in a slow start to the program year. This is discussed in further detail in Section 3.1 of this report.
- The Low-Income EE Program attained most (86%) of its planned savings in PY8, but neither of the program's solutions met their savings projections and the Low-Income carve-out forecast was not achieved. As with the Residential EE Program, early feedback process evaluation research indicates that the shortfall is likely a result of CSP and implementation plan changes. For example, in Phase II, the Low-Income CSP was solely responsible for outbound calling to generate site visits for LEEP. In PY8, the EEMF marketing plan called for increased promotional activities to generate customer interest, including promotional signs on buses and bus stations, direct mail, etc. This shift, in combination with a new portfolio-wide call center focused primarily on managing incoming calls rather than outbound calls for the Low-Income EE Program, caused a delay in new customer enrollment and a slow start to the program year. These issues are discussed in further detail in Section 3.2 of this report.
- The Small and Large C&I Programs each fell short of projections across all solutions. Navigant and PECO are continuing to work through early and continuous process evaluation results to identify the drivers of these shortfalls; this work will stretch into PY9 research. At this time,

Navigant is able to report that changes in the EE&C Plan design likely resulted in lags in implementation and participation. For example, the Phase III EE&C Plan resulted in significant changes in the incentive structure for most C&I measures as well as changes in CSP roles. These issues are discussed in further detail in Sections 3.3 and 3.4 of this report.

- The CHP program underwent a significant rebranding in PY8 with changes to its customer outreach and enrollment processes. The rebranding process took longer than expected delaying the program launch into the fourth quarter of PY8. The program successfully recruited participants in PY8 but was unable to complete the application and due diligence reviews in time to include these participants in PY leading to zero participation. Navigant will conduct targeted process evaluation research in PY9 to identify what is driving application delays and the lack of activity within the program.
- There are no reported savings for DR programs in PY8.

As mentioned, Navigant and PECO are currently working through continuous process evaluation discussions to identify potential changes to the Phase III programs. There are no official, significant changes to report at this time, however Navigant has made program specific recommendations as discussed in the subsequent sections of this report. See Table 2-22 for a summary of these recommendations.

2.12 Findings and Recommendations

The PY8 impact and early process evaluation activities completed by Navigant led to a variety of recommendations for program improvement. Table 2-22 lists the overarching recommendations that affect more than one program, the evaluation activity(s) that uncovered the finding, and Navigant's recommendation(s) to PECO to address the finding. Detailed findings and recommendations for each program and solution are discussed in subsequent sections of this report.

Table 2-22. Summary of Evaluation Recommendations

Evaluation Activity	Finding	Recommendation
All Programs, All Activities	As of the writing of this report, it is clear that PECO and its CSPs needed time in PY8 to adjust to new requirements and implementation changes and that some of the elements required for success, such as supporting data, infrastructure, and collaboration are still in progress.	Navigant should continue to work with PECO to conduct a targeted process evaluation to inform continuous improvement opportunities for the program and solutions.
Residential EE Program, Customer Survey	Survey findings indicate that PECO's marketing initiatives, home energy audits, and HERs sent via the Behavioral Solution are not yet top sources of information for customers. Advertising efforts and PECO's main channeling programs, while important to the implementation plan, may not yet be as memorable to customers compared to tangible, direct-to-the-customer bill inserts or personal word of mouth marketing channels, such as landlords, personal contacts, and contractors.	PECO should continue to closely monitor marketing alignment with solution CSPs to ensure customer awareness efforts are optimized. PECO should also look for ways to leverage the power of word of mouth and direct-to-customer marketing channels. Finally, Navigant should continue working with PECO to conduct a targeted process evaluation to inform continuous improvement opportunities for the program and solutions.
Residential EE Program, Customer Survey	In general, Residential EE Program participants are not learning about PECO's other offerings during the course of their experience within their respective solution, resulting in a missed opportunity to increase participation across the program.	PECO and Navigant should examine which solutions promote and increase awareness and are successfully channeling participants into other solutions and which are not. This will allow the team to identify best practices and barriers and to make further recommendations for improvements.

Evaluation Activity	Finding	Recommendation
Residential EE Program, Customer Survey	Participants across the three Residential EE Program solutions included in the survey said they were either likely or extremely likely to recommend the solution to another person.	As customer referrals and testimonials can be a powerful way to market programs and because this solution needs to increase participation moving forward, PECO should consider leveraging these customers by including quotes from them on marketing materials and perhaps by conducting a <i>referral contest to encourage word of mouth</i> marketing.
C&I Programs, Equipment and Systems and New Construction Solutions, Staff and CSP Interviews	Customer and incentive administrators have indicated that Appendix C is difficult to customize complete.	PECO and Navigant should explore and suggest improvements to Appendix C to allow for easier savings calculations and a better customer experience.
C&I Programs, Equipment and Systems, New Construction, Multifamily Targeted Market Segment, Phone Verification	Evaluating sites via phone verification may not be providing significant value to the evaluation of the program. Typical phone verification results do not differ greatly from the reported values and do not provide significant insight into individual projects or the program as a whole.	Navigant recommends shifting resources away from verifying projects via a phone conversation with the customer to doing more on-site and file review work. Specifically, Navigant sees value in shifting resources to doing on-site work for small stratum customers.

Source: Navigant analysis

3. EVALUATION RESULTS BY PROGRAM

This section documents the gross impact, net impact, and process evaluation activities conducted in PY8 along with the outcomes of those activities. Not every program receives an evaluation every PY. Table 3-1 shows a breakdown of the evaluation activity plan, with a check mark indicating the type of evaluation Navigant will conduct for each program over each year.

Table 3-1. Evaluation Activity Matrix

Program	Solution	PY8			PY9			PY10			PY11			PY12		
		Gross	Net	Process	Gross	Net	Process	Gross	Net	Process	Gross	Net	Process	Gross	Net	Process
Residential EE	Lighting, Appliances & HVAC	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Appliance Recycling	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Whole Home	√			√	√	√	√			√	√	√			
	New Construction				√	√	√	√			√	√	√	√		
	Multifamily Targeted	√	√	√	√			√	√	√	√			√	√	√
	Behavioral	√		√	√			√		√	√			√		√
Residential Low-Income EE	Whole Home	√		√				√		√				√		
	Lighting	√		√	√		√	√		√		√		√		√
Small C&I EE	Equipment and Systems	√			√	√	√	√			√	√	√	√		
	New Construction	√			√	√	√	√			√	√	√	√		
Small C&I EE	Whole Building				√	√	√				√	√	√			
	Behavioral	√		√	√			√		√				√		√
	Data Center Targeted	√			√	√	√	√			√	√	√	√		
	Multifamily Targeted	√	√	√	√			√	√	√	√				√	√
Large C&I EE	Equipment and Systems	√			√	√	√	√			√	√	√	√		
	New Construction	√			√	√	√	√			√	√	√	√		
	Data Center Targeted	√			√	√	√	√			√	√	√	√		

Program	Solution	PY8			PY9			PY10			PY11			PY12		
		Gross	Net	Process	Gross	Net	Process	Gross	Net	Process	Gross	Net	Process	Gross	Net	Process
Combined Heat and Power	Multifamily Targeted	√	√	√	√			√	√	√	√					
	Combined Heat and Power	√			√	√	√	√				√	√	√	√	
DR	Residential DR	√			√	√		√			√	√			√	
	Small C&I DR	√			√	√		√			√				√	
	Large C&I DR				√		√				√		√			

Source: Navigant analysis

3.1 Residential EE Program

The PECO Residential EE Program is designed to offer residential customers opportunities to save energy across all their electric end uses and to market those opportunities in ways that minimize lost savings opportunities. The program encompasses a comprehensive series of solutions designed to influence customer behavior and purchasing decisions.

The Residential EE Program represents 77% of PECO's PY8 portfolio reported energy savings and consists of six solutions or initiatives that contribute those savings. Savings are achieved through a range of delivery mechanisms and methods including upstream incentives (i.e., manufacturer buy downs), downstream incentives (i.e., mail-in rebates), appliance removal and recycling, in-home audits, direct install measures, efficient building construction, and changes in household behaviors. PECO relies on six CSPs to deliver the program savings, shown here with their corresponding solution:

1. Lighting, Appliances & HVAC Solution – Ecova
2. Appliance Recycling Solution – ARCA
3. Whole Home Solution – CLEAResult and Ecova
4. New Construction Solution – Performance Systems Development (PSD)
5. Multifamily Targeted Market Segment – Franklin
6. Behavioral Solution – Oracle

Marketing for the six solutions in the Residential EE Program is handled through a separate energy efficiency marketing firm (EEMF), ICF. The EEMF markets PECO's range of Residential EE Program offerings delivered through the six solutions with consistent and approaches and messaging. Marketing from a crosscutting perspective is intended to promote all savings opportunities available to residential customers.

Appendix D contains additional detail on the individual solutions, including descriptions of major measures, CSPs, and how participants are counted.

3.1.1 Participation and Reported Savings by Customer Segment

This section provides the total Residential EE Program results for PY8, including participation, energy and demand savings, and incentive costs.²³ Table 3-2 presents the participation counts and incentive payments for the Residential EE Program in PY8 by customer segment.

²³ Table 3-2 through Table 3-4 include all Residential EE Program results, including low-income carve-outs.

Table 3-2. Summary Statistics for Residential EE Program by Customer Segment

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Residential	1,120,660	-	-	-	-	1,120,660
	Small C&I	214	-	-	-	-	214
	Large C&I	11	-	-	-	-	11
	Total	1,120,885	-	-	-	-	1,120,885
Incentive Spending (\$1,000)	Residential	4,668	-	-	-	-	4,668
	Small C&I	7	-	-	-	-	7
	Large C&I	0	-	-	-	-	0
	Total	4,675	-	-	-	-	4,675

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-3 provides a summary of reported, verified, and net energy savings results by customer sector for the Residential EE Program for PY8. Note that the Residential Whole Home Solution includes unverified savings that are not reflected in the RR. The Whole Home Solution is undergoing a 2-year evaluation, combining PY8 and PY9; hence, savings for PY8 are unverified. The combined PY8 and PY9 evaluation will result in total verified savings for the 2-year period ending in and reported during PY9. PY9 verified savings will be adjusted to incorporate the impact evaluation and NTG results for the combined period.

Table 3-3. Summary of Energy Savings for Residential EE Program by Customer Segment

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Energy Savings (MWh)	Residential	147,799.1	-	-	-	-	147,799.1
	Small C&I	116.4	-	-	-	-	116.4
	Large C&I	3.6	-	-	-	-	3.6
	Total	147,919.1	-	-	-	-	147,919.1
Verified Gross Energy Savings (MWh)	Residential	144,410.2	-	-	-	-	144,410.2
	Small C&I	3,787.9	-	-	-	-	3,787.9
	Large C&I	3.3	-	-	-	-	3.3
	Total	148,201.4	-	-	-	-	148,201.4
Energy Savings RR	Residential	0.98	-	-	-	-	0.98
	Small C&I	32.55	-	-	-	-	32.55
	Large C&I	0.93	-	-	-	-	0.93
	Total	1.00	-	-	-	-	1.00
Verified Net Energy Savings (MWh)	Residential	102,222.5	-	-	-	-	102,222.5
	Small C&I	1,809.8	-	-	-	-	1,809.8
	Large C&I	1.3	-	-	-	-	1.3
	Total	104,033.6	-	-	-	-	104,033.6

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
NTG Ratio	Residential	0.71	-	-	-	-	0.71
	Small C&I	0.48	-	-	-	-	0.48
	Large C&I	0.40	-	-	-	-	0.40
	Total	0.70	-	-	-	-	0.70

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-4 provides the reported and verified demand savings results for the Residential EE Program for PY8. At the SWE's recommendation, Navigant calculated a peak demand realization rate of 1.69. This value includes verified demand estimates of 7.24 MW for the Behavior Solution of the Residential EE program. Navigant notes that PECO's reported peak demand (the denominator of the realization rate) does not include any reductions from that solution. PECO chose to only report energy impacts. For context, excluding the Behavior Solution results from consideration, the peak demand realization rate for the Residential EE program is 1.07.

Table 3-4. Summary of Demand Savings for Residential EE Program by Customer Segment

Parameter	Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Demand Savings (MW)	Residential	11.68	-	-	-	-	11.68
	Small C&I	0.02	-	-	-	-	0.02
	Large C&I	0.00	-	-	-	-	0.00
	Total	11.70	-	-	-	-	11.70
Verified Gross Demand Savings (MW)	Residential	18.97	-	-	-	-	18.97
	Small C&I	0.79	-	-	-	-	0.79
	Large C&I	0.00	-	-	-	-	0.00
	Total	19.75	-	-	-	-	19.87
Demand Savings RR	Residential	1.62	-	-	-	-	1.62
	Small C&I	40.48	-	-	-	-	40.48
	Large C&I	1.00	-	-	-	-	1.00
	Total	1.69	-	-	-	-	1.69

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Unverified savings for the Whole Home Solution during PY8 are detailed in Table 3-5.

Table 3-5. PY8 Whole Home Unverified Savings

Solution	Unverified PYRTD MWh/yr	Unverified PYRTD MW/yr (EE)
Whole Home	2,709	0.28

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-6 shows the participation and incentive spending for the low-income and government/education/non-profit (G/E/NP) sector carve-outs.

Table 3-6. Summary Statistics for Residential EE Program by Carve-Out

Parameter	Carve-Out	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Low-Income	0	-	-	-	-	0
	G/E/NP	0	-	-	-	-	0
Incentive Spending (\$1,000)	Low-Income	0	-	-	-	-	0
	G/E/NP	0	-	-	-	-	0

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-7 shows the reported, verified, and net energy savings results for the sector carve-outs.

Table 3-7. Summary of Energy Savings for Residential EE Program by Carve-Out

Parameter	Carve-Out	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Energy Savings (MWh)	Low-Income	0.0	-	-	-	-	0.0
	G/E/NP	0.0	-	-	-	-	0.0
Verified Gross Energy Savings (MWh)	Low-Income	0.0	-	-	-	-	0.0
	G/E/NP	0.0	-	-	-	-	0.0
Energy Savings RR	Low-Income	0.00	-	-	-	-	0.00
	G/E/NP	0.00	-	-	-	-	0.00
Verified Net Energy Savings (MWh)	Low-Income	0.0	-	-	-	-	0.0
	G/E/NP	0.0	-	-	-	-	0.0
NTG Ratio	Low-Income	0.00	-	-	-	-	0.00
	G/E/NP	0.00	-	-	-	-	0.00

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-8 shows the reported and verified demand (MW) savings results for the sector carve-outs.

Table 3-8. Summary of Demand Savings for Residential EE Program by Carve-Out

Parameter	Carve-Out	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Demand Savings (MW)	Low-Income	0.00	-	-	-	-	0.00
	G/E/NP	0.00	-	-	-	-	0.00
Verified Gross Demand Savings (MW)	Low-Income	0.00	-	-	-	-	0.00
	G/E/NP	0.00	-	-	-	-	0.00
Demand Savings RR	Low-Income	0.00	-	-	-	-	0.00
	G/E/NP	0.00	-	-	-	-	0.00

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

3.1.2 Gross Impact Evaluation

The Residential EE Program gross impact evaluation activities involved different approaches tailored to each solution's unique characteristics to verify the reported gross savings values for PY8. First, each solution's program tracking data was reviewed to verify proper application of Pennsylvania Technical Reference Manual²⁴ (PA TRM or TRM) algorithms in reported savings values. Navigant completed these reviews for the full population of implemented PY8 Residential EE Program measures. Next, the team identified appropriate evaluation activities for each solution depending on the nature of the participants, implementation, and the level of information accompanying the reported savings. The goal of the evaluation activities included verifying the implementation of a given measure occurred. Additionally, for partially deemed measures, the evaluation also verified certain measure characteristics that inform the estimation of gross energy and demand impacts—in particular, those characteristics where the PA TRM does not provide default or deemed values for EDCs to use for savings estimations. The evaluation activities varied for each solution and for specific strata within some solutions. Activities included engineering file reviews of program applications and invoices, participant phone verifications, in-store intercept surveys, onsite field verifications, billing and regression analyses, or a combination of these activities.

Onsite verification field activities occurred for the upstream lighting component of the Lighting, Appliances & HVAC Solution where Navigant completed in-store intercepts. Master-metered non-residential projects within the Multifamily Targeted Market Segment also received onsite visits for verification. While the Multifamily Targeted Market Segment contributes savings to the Residential EE Program, savings from these particular master-metered projects receiving onsite verifications are reported within the Small C&I EE and Large C&I EE Programs.

Navigant then drew samples from each solution for these gross impact evaluation activities. The team developed and sought approval for representative samples that complied with the Phase III Evaluation Framework, the PA TRM, industry standards, and that helped PECO meet the SWE and Commission requirements.

²⁴ Pennsylvania Public Utility Commission, *Technical Reference Manual; State of Pennsylvania Act 129 Energy Efficiency and Conservation Program & Act 213 Alternative Energy Portfolio Standards*, dated June 2016, errata update February 2017.

The following provides a summary of the activities conducted for each solution and for specific components or sampled strata within a given solution. Appendix D also contains additional detail on the gross impact evaluation approaches used for the individual solutions of the Residential EE Program.

- Lighting, Appliances & HVAC Solution
 - Lighting
 - In-store customer intercept surveys
 - Invoice reviews and record-level savings calculation
 - Appliances and HVAC
 - Engineering files reviews and phone verification (for HVAC measures)
 - Phone verification (for Appliance measures)
- Appliance Recycling Solution
 - Phone verification
 - Regression analysis
- Whole Home Solution²⁵
 - Primary analysis activities are currently underway for a 2-year evaluation combining PY8 and PY9; activities include:
 - Engineering file reviews and onsite verification (projects with major measures)
 - Engineering file reviews and phone verification (projects with direct install measures only)
- New Construction Solution
 - Apply PY7 realization rates (primary analysis activities will occur in PY9)
- Multifamily Targeted Market Segment
 - Engineering file reviews and phone verification (residential projects that contribute to the Residential EE Program)
 - Engineering file reviews and onsite verification (master-metered non-residential projects that contribute to the Small C&I EE and Large C&I EE Programs)
- Behavioral Solution
 - Billing analysis
 - For home energy report (HER) program participants in the test and control groups using a lagged dependent variable (LDV) model
 - For AC Saver cohort recipients included within the Behavioral Solution that used a regression with pre-program matching (RPPM) method to estimate savings related to HERs
 - Double counted analysis
 - Accounting for Behavioral Solution participant activities within other PECO EE solutions

²⁵ The Whole Home Solution is undergoing a 2-year evaluation, combining PY8 and PY9; hence, savings for PY8 are unverified. The combined PY8 and PY9 evaluation will result in total verified savings for the 2-year period ending in and reported during PY9. PY9 verified savings will be adjusted to incorporate the impact evaluation and NTG results for the combined period.

Table 3-9 provides the sampling frame for the gross impact evaluation of the Residential EE Program in PY8.

Table 3-9. Residential EE Program Gross Impact Sample Design for PY8

Stratum Solution	Stratum Name	Percentage of Program Reported Savings	Population Size	Achieved Sample Size	Verification Method
Lighting, Appliances, and HVAC	Standard LED	17%	N/A	370	In-store intercept
	Specialty LED	25%	N/A	503	In-store intercept
	CFL	3%	N/A	146	PY7 analysis
	Appliances	1%	7,658	75	Phone survey
	HVAC	3%	9,303	40	Engineering file review and phone verification
	Solution Total		48%	16,961	1,134
Appliance Recycling	Refrigerators	5%	7,235	164	Regression and phone verification
	Freezers	1%	1,569	47	Regression and phone verification
	Room Air Conditioners	0%	769	10	Regression and phone verification
	Solution Total	6%	9,573	221	
Whole Home	Solution Total	2%	2,359	N/A	N/A
New Construction	Solution Total	0%	311	10	PY7 analysis
Behavior	Solution Total	42%	396,709	N/A	Regression analysis
Multifamily Targeted	Large Residential	1%	865	31	Phone verification
	Small Residential	1%	3,377	33	Phone verification
	Solution Total	1%	4,242	64	
Total Program	All	100%	430,155	1,429	

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-10 provides a summary of reported and verified energy (MWh) savings results, along with the coefficient of variation (C_v) and relative precision for each stratum sampled for the Residential EE Program in PY8.

Table 3-10. Residential EE Program Gross Energy Savings Impact Evaluation Results for PY8

Stratum Solution	Stratum Name	Reported Gross Energy Savings (MWh)	Verified Gross Energy Savings (MWh)	Energy RR	Achieved Sample C _v or Error Ratio	Relative Precision at 85% Confidence Interval	Relative Precision at 90% Confidence Interval
Lighting, Appliances, and HVAC	Standard LED	25,172.9	25,437.7	1.01	N/A	0.01	0.01
	Specialty LED	36,718.6	38,076.9	1.04	N/A	0.01	0.01
	CFL	4,621.7	5,467.2	1.18	N/A	0.11	0.11
	Appliances	1,010.9	1,010.9	1.00	0.07	0.01	0.01
	HVAC	4,015.5	4,170.3	1.04	0.13	0.03	0.03
	Solution Total		71,539.7	74,163.2	1.04	0.31	0.01
Appliance Recycling	Refrigerators	7,032.3	6,753.1	0.96	0.00	0.00	0.00
	Freezers	1,373.5	1,091.5	0.79	0.00	0.00	0.00
	Room Air Conditioners	124.3	124.3	1.00	0.00	0.00	0.00
	Solution Total	8,530.2	7,967.9	0.93	0.00	0.00	0.00
Whole Home	Solution Total	2,709.2	0.0	N/A	N/A	N/A	N/A
New Construction	Solution Total	737.9	730.5	0.99	0.05	0.02	0.02
Behavior	Solution Total	62,424.0	63,384.6	1.02	N/A	N/A	N/A
Multifamily Targeted	Large Residential	989.6	977.0	0.99	0.07	0.02	0.02
	Small Residential	988.6	978.2	0.99	0.08	0.02	0.02
	Solution Total	1,978.2	1,955.2	0.99	0.10	0.01	0.02
Total Program	All	147,919.1	148,201.4	1.00	0.17	0.01	0.01

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-11 provides a summary of reported and verified demand (MW) savings results, along with the C_v and relative precision for each stratum sampled for the Residential EE Program in PY8.

Table 3-11. Residential EE Program Gross Demand Savings Impact Evaluation Results for PY8

Stratum Solution	Stratum Name	Reported Gross Demand Savings (MW)	Verified Gross Demand Savings (MW)	Demand RR	Achieved Sample Cv or Error Ratio	Relative Precision at 85% Confidence Interval	Relative Precision at 90% Confidence Interval
Lighting, Appliances, and HVAC	Standard LED	2.97	3.04	1.02	N/A	0.01	0.01
	Specialty LED	4.33	4.66	1.08	N/A	0.01	0.01
	CFL	0.54	0.77	1.41	N/A	0.11	0.13
	Appliances	0.17	0.17	1.00	0.27	0.05	0.05
	HVAC	1.75	2.38	1.36	0.69	0.16	0.18
	Solution Total		9.75	11.00	1.13	1.15	0.04
Appliance Recycling	Refrigerators	0.81	0.76	0.93	0.00	0.00	0.00
	Freezers	0.16	0.12	0.78	0.00	0.00	0.00
	Room Air Conditioners	0.20	0.20	1.00	0.00	0.00	0.00
	Solution Total	1.17	1.18	0.92	0.00	0.00	0.00
Whole Home	Solution Total	0.25	N/A	N/A	N/A	N/A	N/A
New Construction	Solution Total	0.28	0.19	0.76	N/A	0.22	0.26
Behavior	Solution Total	0.00	7.24	N/A	N/A	N/A	N/A
Multifamily Targeted	Large Residential	0.13	0.13	0.99	0.39	0.10	0.12
	Small Residential	0.12	0.11	0.99	0.46	0.12	0.14
	Solution Total	0.25	0.24	0.99	0.60	0.08	0.09
Total Program	All	11.70	19.8	1.69	N/A	0.02	0.02

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Factors leading to variations between the reported and verified savings and the observed RRs for the Residential EE Program are detailed for each solution in Appendix D. Overall, the Lighting, Appliances & HVAC Solution and the Behavioral Solution are the most significant drivers of the program-level results and RRs, as these two solutions represent roughly 90% of the program savings.

3.1.3 Net Impact Evaluation

The Residential EE Program net impact evaluation activities used several methods to estimate free ridership, spillover, market effects, and NTG ratios for each solution. Navigant relied on consistent, crosscutting approaches as well as ones tailored to certain solutions' unique characteristics. The primary objective of the net savings analysis was to determine the program's net effect on customer electricity usage. Navigant derived net program impacts by estimating a NTG ratio that quantifies the percentage of the gross program impacts that can reliably be attributed to the program.

Free ridership is defined as those participants who would have implemented a measure or purchased equipment anyway, without program support or a rebate. The key questions determining free ridership focus on the influence of key program interventions. These interventions vary by solution but can include discounted prices, program information regarding efficient products, and placement of program-discounted products in stores, as well as the customer's perception of what they would most likely have done in the absence of the program.

Spillover is defined as those participants who were influenced by the program to purchase and install additional energy efficient equipment that saves electricity without a rebate or other program support. Navigant analyzed participant responses to a battery of spillover questions. The intent of these questions was to identify what types and amounts of equipment customers purchased and installed on their own to inform a quantitative estimate of program spillover within the overall NTG calculation.

Market effects represent a change in the structure of a market or the behavior of participants in a market that is reflective of an increase in the adoption of EE products, services, or practices and is casually related to market intervention(s).

PECO program and solution participants were surveyed via phone to gather information about free ridership and spillover. Navigant developed survey instruments consistent with the Phase III Evaluation Framework's guidance on net impact evaluation techniques²⁶ and guidance from the Uniform Methods Project on estimating net savings.²⁷ The team carefully reviewed and managed samples across solutions to reduce the likelihood that a respondent participating in multiple solutions during PY8 would be called multiple times to respond to the survey. Survey instruments also captured feedback about customer experiences from participants to inform the process evaluation. Some solutions or strata within solutions (i.e., appliances from Lighting, Appliances & HVAC and Appliance Recycling) also added question batteries to the phone surveys to inform the gross impact verification. Finally, while most solutions and strata within solutions used a phone survey method, the upstream lighting component of the Lighting, Appliances & HVAC Solution (i.e., in-store intercepts) relied on onsite interview methods. These efforts used similar question batteries and techniques as previously described.

²⁶ Phase III Evaluation Framework. Section 3.4. http://www.puc.pa.gov/Electric/pdf/Act129/SWE_PhaseIII-Evaluation_Framework102616.pdf

²⁷ The Uniform Methods Project. *Estimating Net Savings: Common Practices*. NREL. <https://www.nrel.gov/docs/fy14osti/62678.pdf>

Appendix D contains additional detail on the net impact evaluation approaches used for the individual solutions of the Residential EE Program. Table 3-12 provides the sampling frame for the net impact evaluation of the Residential EE Program in PY8.

Table 3-12. Residential EE Program Net Impact Sample Design for PY8

Stratum Solution	Stratum Name	Percentage of Program Reported Savings	Population Size	Achieved Sample Size	Response Rate	Verification Method
Lighting, Appliances & HVAC ^[1]	Standard LEDs	17%	167,562	370 ^[2]	0.26%	In-store Intercepts
	Specialty LEDs	25%	152,760	503		
	CFLs	3%	13,509	0	0.93%	Phone Survey
	Appliances	1%	7,026	75		
	HVAC	3%	9,187	75		
Solution Total	48%	350,044	1,023			
Appliance Recycling	Refrigerators	4%	7,235	164	3.2%	Phone Survey
	Freezers	1%	1,569	47		
	Room AC	0%	769	10		
Solution Total	5%	9,573	221			
Whole Home	Solution Total	2%	2,359	N/A	N/A	PY7 Smart House Call NTGR
New Construction	Solution Total	0%	311	N/A	N/A	PY7 Smart Builder Rebates NTGR
Behavioral	Solution Total	42%	0	N/A	N/A	N/A
Multifamily Targeted Market Segment	Residential - Small	1%	3,377	35	2.0%	Phone Survey
	Residential - Large	1%	865	31		
	Solution Total	1%	4,242	66		
Total Program	All	100%	366,529	1,310		N/A

[1] Lighting in-store intercepts were conducted in 28 individual retailer locations and 83 visits were completed for this study. In total, 864 surveys were completed. Of those surveys, 487 were program bulb surveys with 218 including standard LEDs and 274 including specialty LEDs.

[2] This number represents the count of bulbs stock keeping units (SKUs), or bulb packages, sampled for this study.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-13 provides a summary of reported and verified energy (MWh) savings results, the calculated NTG results, and the Cv and relative precision for each stratum sampled for the Residential EE Program in PY8.

Table 3-13. Residential EE Program Net Energy Savings Impact Evaluation Results for PY8

Solution Name	Stratum Name	Verified Gross Energy Savings (MWh)	Verified Net Energy Savings (MWh)	Free Ridership Rate	Spillover Rate	NTG Ratio	Achieved Sample Cv or Error Ratio	Relative Precision at 85% Confidence Interval	Relative Precision at 90% Confidence Interval
Lighting, Appliances & HVAC	Standard LEDs	25,437.7	12,971.5	0.53	0.04	0.51	0.37	0.03	0.04
	Specialty LEDs	38,076.9	17,483.8	0.58	0.04	0.46	0.40	0.03	0.03
	CFLs	5,467.2	2,186.9	0.61	0.01	0.40	1.01	0.18	N/A
	Appliances	1,010.9	663.3	0.55	0.21	0.66	1.63	0.29	0.33
	HVAC	4,170.3	2,351.1	0.46	0.03	0.56	0.30	0.05	0.05
	Solution Total		74,163.2	35,656.5	0.56	0.04	0.48	0.58	0.02
Appliance Recycling	Refrigerators	6,753.1	2,341.8	0.65	0.00	0.35	0.35	0.16	0.18
	Freezers	1,090.5	541.0	0.50	0.00	0.50	0.50	0.21	0.24
	Room AC	124.3	57.6	0.54	0.00	0.46	0.46	0.54	0.62
	Solution Total	7,967.9	2,940.4	0.63	0.00	0.37	1.90	0.13	0.15
Whole Home	Solution Total	0.0	0.0	0.13	0.07	0.94	0.40	0.05	N/A
New Construction	Solution Total	730.5	365.3	0.50	0.00	0.50	0.48	0.17	N/A
Behavioral	Solution Total	63,384.6	63,384.6	0.00	0.00	1.00	N/A	N/A	N/A
Multifamily Targeted Market Segment	Residential – Small	978.2	896.3	0.12	0.03	0.92	0.06	0.01	0.02
	Residential - Large	977.0	790.6	0.20	0.01	0.81	0.05	0.01	0.01
	Solution Total	1,955.2	1,686.9	0.16	0.02	0.86	0.05	0.01	0.01
Total Program	All	148,201.4	104,033.6	0.32	0.02	0.70	0.26	0.01	0.01

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Factors leading to these verified energy savings and NTG ratios for the Residential EE Program are detailed in Appendix D for each solution. Overall and similar to the gross verified impact findings, the Lighting, Appliances & HVAC Solution and the Behavioral Solution are the most significant drivers of the program-level results and NTG ratios, as these two solutions represent roughly 90% of the program savings. Further, the nature of the Behavioral Solution's implementation and subsequent analysis result in the estimation of net impacts. In other words, there are no free riders or instances of spillover estimated for the Behavioral Solution.

3.1.3.1 High Impact Measure Research

HIMs represent measure categories or technologies of high importance. In Phase III, the SWE suggested EDCs oversample HIMs to help program planners make decisions concerning those measures for downstream programs only.²⁸ EDCs were to identify three to five measures for study within each program year based on energy impact, level of uncertainty, prospective value, funding, or other parameters. The SWE stated that HIMs should be sampled at 85% confidence and 15% absolute precision to ensure an adequate sample size for statistically valid, measure-level NTG estimates. Below is a description of the methodology used to determine the HIMs in PY8.

Navigant identified HIMs through several steps that involved careful review of program- and solution-level savings, energy impact, and value to PECO. In PY8, NTG research focused primarily on solutions in the Residential EE Program. Navigant reviewed savings across all sectors and solutions under the Residential EE Program and focused on measures based on both the measure category²⁹ and end-use subcategory to identify the types of measures falling under a certain category. Lighting, Appliances, and HVAC measure categories were flagged as HIMs, including the end-use subcategories of LEDs, refrigerators, freezers, furnace fans, heat pumps, and air conditioners. CFLs were excluded because PECO discontinued incentives for this measure as of January 1, 2017. Table 3-14 shows the measure and end-use subcategories identified as HIMs in PY8 based on PECO's Phase III planning. Table 3-15 also shows the summary results of the NTG research conducted for Residential EE Program HIMs. These details are also provided in Section 2.6.

²⁸ Phase III Evaluation Framework. Section 3.4.1.4. http://www.puc.pa.gov/Electric/pdf/Act129/SWE_PhaseIII-Evaluation_Framework102616.pdf

²⁹ PECO Phase III data refers to measure categories as the "Measure Name."

Table 3-14. Residential EE Program Savings by Measure Category and HIM End-Use Subcategory

Measure Names and End-Use Subcategories	Sum of kWh Savings	Percentage of Savings
Lighting	68,981,927	84%
LED	63,514,692	77%
Appliances	9,108,986	11%
Refrigerator	7,138,380	9%
Freezer	1,378,688	2%
HVAC	4,327,333	5%
Furnace Fan	1,338,059	2%
Heat Pump	1,228,804	1%
Air Conditioner	895,982	1%

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: PECO

Table 3-15. Residential EE Program HIM NTG Summary

Residential EE HIM	Parameter	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Multifamily: LEDs	Free Ridership	0.19	-	-	-	-	0.19
	Spillover	0.03	-	-	-	-	0.03
	NTG Ratio	0.84	-	-	-	-	0.84
Lighting, Appliances, & HVAC: Heat Pumps	Free Ridership	0.46	-	-	-	-	0.46
	Spillover	0.02	-	-	-	-	0.02
	NTG Ratio	0.56	-	-	-	-	0.56
Lighting, Appliances, & HVAC: Central Air Conditioners	Free Ridership	0.58	-	-	-	-	0.58
	Spillover	0.04	-	-	-	-	0.04
	NTG Ratio	0.45	-	-	-	-	0.45
Lighting, Appliances, & HVAC: High Efficiency Furnace Fan	Free Ridership	0.48	-	-	-	-	0.48
	Spillover	0.02	-	-	-	-	0.02
	NTG Ratio	0.53	-	-	-	-	0.53
Appliance Recycling: Refrigerator Recycling	Free Ridership	0.65	-	-	-	-	0.65
	Spillover	0.00	-	-	-	-	0.00
	NTG Ratio	0.35	-	-	-	-	0.35
Appliance Recycling: Freezer Recycling	Free Ridership	0.50	-	-	-	-	0.50
	Spillover	0.00	-	-	-	-	0.00
	NTG Ratio	0.50	-	-	-	-	0.50

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

3.1.4 Verified Savings Summary by Solution

Table 3-16 shows the participation and incentive spending results for the Residential EE Program at the solution level.

Table 3-16. Summary Statistics for Residential EE Program by Solution

Parameter	Solution/Targeted Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Participation	Lighting, Appliances & HVAC	708,777	-	-	-	-	708,777
	Appliance Recycling	8,492	-	-	-	-	8,492
	Whole Home	2,359	-	-	-	-	2,359
	New Construction	311	-	-	-	-	311
	Behavioral	396,709	-	-	-	-	396,709
	Multifamily Targeted	4,237	-	-	-	-	4,237
	Program Total	1,120,885	-	-	-	-	1,120,885
Incentive Spending (\$1,000)	Lighting, Appliances & HVAC	3,976	-	-	-	-	3,976
	Appliance Recycling	379	-	-	-	-	379
	Whole Home	117	-	-	-	-	117
	New Construction	204	-	-	-	-	204
	Behavioral	0	-	-	-	-	0
	Multifamily Targeted	0	-	-	-	-	0
	Program Total	4,675	-	-	-	-	4,675

Note: Costs associated with direct install measures are categorized as costs and not incentives for reporting purposes.

Note: Values in tables may not reconcile exactly with the sum of more detailed level results or previously reported results due to rounding.

Source: Navigant analysis

Table 3-17 shows the summary of reported and verified energy (MWh) savings results by solution.

Table 3-17. Summary of Residential EE Program Incremental Annual Gross Energy Savings by Solution

Parameter	Solution/Targeted Customer Segment	Program Year					Phase III to Date
		PY8	PY9	PY10	PY11	PY12	
Reported Gross Energy Savings (MWh)	Lighting, Appliances & HVAC	71,539.7	-	-	-	-	71,539.7
	Appliance Recycling	8,530.2	-	-	-	-	8,530.2
	Whole Home	2,709.2	-	-	-	-	2,709.2
	New Construction	737.9	-	-	-	-	737.9
	Behavioral	62,424.0	-	-	-	-	62,424.0
	Multifamily Targeted	1,978.2	-	-	-	-	1,978.2