



Semiannual Report to the Pennsylvania Public Utility Commission

Phase IV of Act 129

Program Year 13
(June 1, 2021 – May 31, 2022)

For Pennsylvania Act 129 of 2008
Energy Efficiency and Conservation Plan

Prepared by Guidehouse Inc.

For:



An Exelon Company

January 14, 2022

guidehouse.com

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Acronyms

BDR	Behavioral Demand Response
C&I	Commercial and Industrial
CSP	Conservation Service Provider or Curtailment Service Provider
DLC	Direct Load Control
DR	Demand Response
EDC	Electric Distribution Company
EDT	Eastern Daylight Time
EE&C	Energy Efficiency and Conservation
EM&V	Evaluation, Measurement, and Verification
EUL	Effective Useful Life
GNI	Government, Nonprofit, Institutional
HVAC	Heating, Ventilating, and Air Conditioning
ICSP	Implementation Conservation Service Provider
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light-Emitting Diode
LIURP	Low-Income Usage Reduction Program
M&V	Measurement and Verification
MW	Megawatt
MWh	Megawatt-hour
NTG	Net-to-Gross
P4TD	Phase IV to Date
PA PUC	Pennsylvania Public Utility Commission
PSA	Phase IV to Date Preliminary Savings Achieved; equal to VTD + PYTD
PSA+CO	PSA savings plus Carryover from Phase III
PY	Program Year: e.g., PY13, from June 1, 2021 to May 31, 2022
PYRTD	Program Year Reported to Date
PYVTD	Program Year Verified to Date
RTD	Phase IV to Date Reported Gross Savings
SWE	Statewide Evaluator
TRC	Total Resource Cost
TRM	Technical Reference Manual
VTD	Phase IV to Date Verified Gross Savings

Types of Savings

Gross Savings: The change in energy consumption 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 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 change in energy consumption or demand not directly attributable to the EE&C program.

Reported Gross: Also referred to as ex ante 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.

Verified Gross: Also referred to as ex post 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 ratio.

Annual Savings: Energy and demand savings expressed on an annual basis or the amount of energy 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 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.

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. Program year to date (PYTD) values for energy efficiency will always be reported as gross savings in a semiannual 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.

Phase IV to Date (P4TD): The energy and peak demand savings achieved by an EE&C program or portfolio within Phase IV of Act 129. Reported in several permutations described as follows:

- **Phase IV to Date Reported (RTD):** The sum of the reported gross savings recorded to date in Phase IV of Act 129 for an EE&C program or portfolio.
- **Phase IV to Date Verified (VTD):** The sum of the verified gross savings recorded to date in Phase IV of Act 129 for an EE&C program or portfolio as determined by the impact evaluation finding of the independent evaluation contractor.
- **Phase IV to Date Preliminary Savings Achieved (PSA):** The sum of the verified gross savings (VTD) from previous program years in Phase IV where the impact evaluation is complete plus the reported gross savings from the current program year (PYTD). For PY13, the PSA savings will always equal the PYTD savings because PY13 is the first program year of the phase (no savings will be verified until the PY13 final annual report even if the approved evaluation, measurement, and verification plan calls for a historical realization rate).
- **Phase IV to Date Preliminary Savings Achieved + Carryover (PSA+CO):** The sum of the verified gross savings from previous program years in Phase IV plus the reported gross savings from the current program year plus any verified gross carryover savings from Phase III of Act 129. This is the best estimate of an EDC's progress toward the Phase IV compliance targets.

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 Phases I (2008 through 2013), II (2013 through 2016), and III (2016 through 2021). In late 2020, 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 IV. Stakeholder input informed the updates to these plans, which were subsequently approved by the PA PUC in 2021.

Implementation of Phase IV of the Act 129 programs began on June 1, 2021. This report documents the progress of the Phase IV EE&C accomplishments for PECO in program year 13 (PY13) and the cumulative accomplishments of the Phase IV programs since inception. It also documents the energy savings carried over from Phase III. The Phase III carryover savings count toward Phase IV EDC savings compliance targets.

This report details the participation, spending, and reported gross impacts of the energy efficiency programs during the first 6 months of PY13. Compliance with Act 129 savings goals is ultimately based on verified gross savings. PECO retained Guidehouse Inc. (Guidehouse) as an independent evaluation contractor for Phase IV of Act 129. Guidehouse is responsible for the measurement and verification (M&V) of the savings and calculation of verified gross savings. The verified gross savings for PY13 energy efficiency programs will be reported in the final annual report to be filed on September 30, 2022.

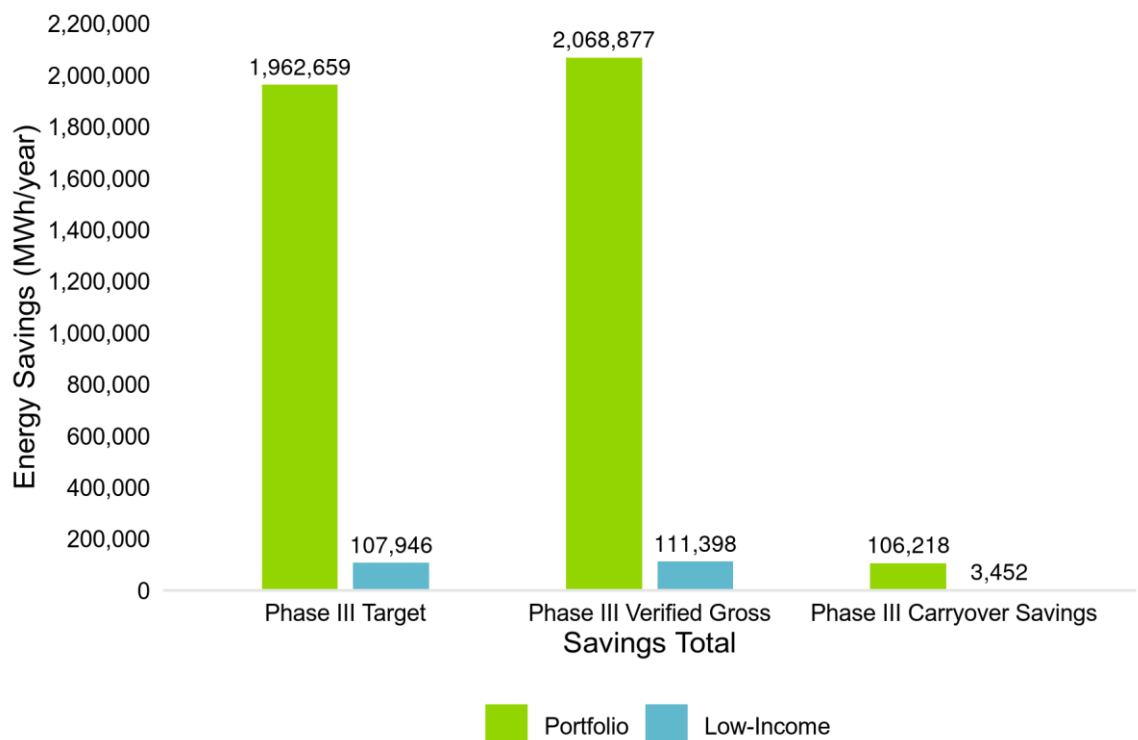
Phase IV of Act 129 includes a peak demand reduction goal for PECO. Unlike previous phases of Act 129, Phase IV peak demand reduction targets must be met through coincident demand reductions from energy efficiency measures. The Act 129 peak demand reduction definition is non-holiday weekdays from 2 p.m. to 6 p.m. in June, July, and August. As in prior phases, compliance with Act 129 peak compliance goals is assessed at the system level so all coincident peak demand impacts are adjusted for line losses.

2. Summary of Achievements

2.1 Carryover Savings from Phase III of Act 129

The PA PUC’s Phase IV Implementation Order¹ allowed EDCs to carry over verified savings above the Phase III portfolio and low-income savings goals and apply those savings toward Phase IV compliance targets. PECO has 106,218 MWh/year of portfolio carryover savings and 3,452 MWh/year of low-income carryover savings from Phase III toward its Phase IV energy reduction targets. Figure 1 compares PECO’s Phase III verified gross savings total to the Phase III compliance target to illustrate the carryover calculation.

Figure 1. Carryover Savings from Phase III of Act 129



Source: Guidehouse analysis

Phase III did not include a peak demand reduction target from energy efficiency, so there are no carryover savings toward the Phase IV peak demand reduction target.

2.2 Phase IV Energy Efficiency Achievements to Date

Since the beginning of PY13 on June 1, 2021, PECO has claimed:

- 113,306 MWh/yr of reported gross electric energy savings (PYRTD and RTD)

¹ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Implementation Order*, at Docket No. M-2020-3015228, (*Phase IV Implementation Order*), entered June 18, 2020.

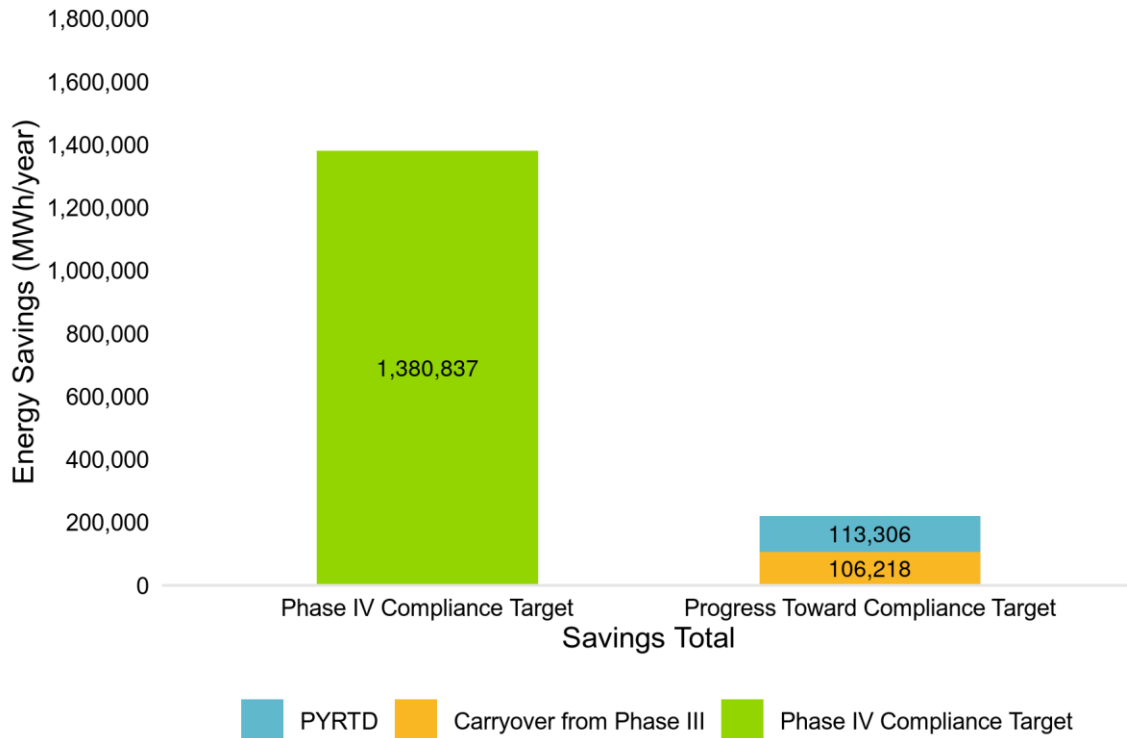
- 20.80 MW/yr of reported gross peak demand savings (PYRTD and RTD)

Including carryover savings from Phase III, PECO has achieved:

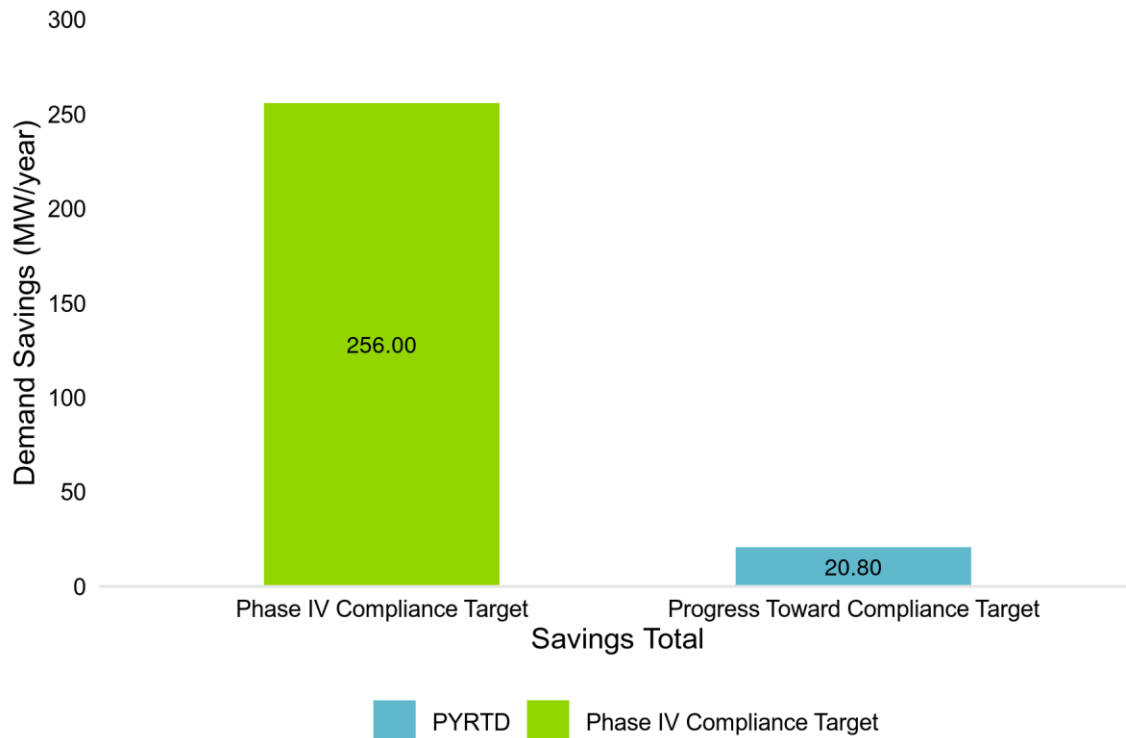
- 219,524 MWh/yr of PSA+CO energy savings recorded to date in Phase IV
 - This value represents 15.9% of the May 31, 2026 energy savings compliance target of 1,380,837 MWh/yr at the meter level without application of any line loss factor.
- 20.80 MW/yr of PSA demand savings recorded to date in Phase IV
 - This value represents 8.1% of the May 31, 2026 energy savings compliance target of 256.00 MW/yr at the system level with application of line loss factors.

Figure 2 and Figure 3 show PECO’s EE&C plan progress toward Phase IV energy conservation and peak demand reduction compliance targets.

Figure 2. Performance toward Phase IV Portfolio Energy Target



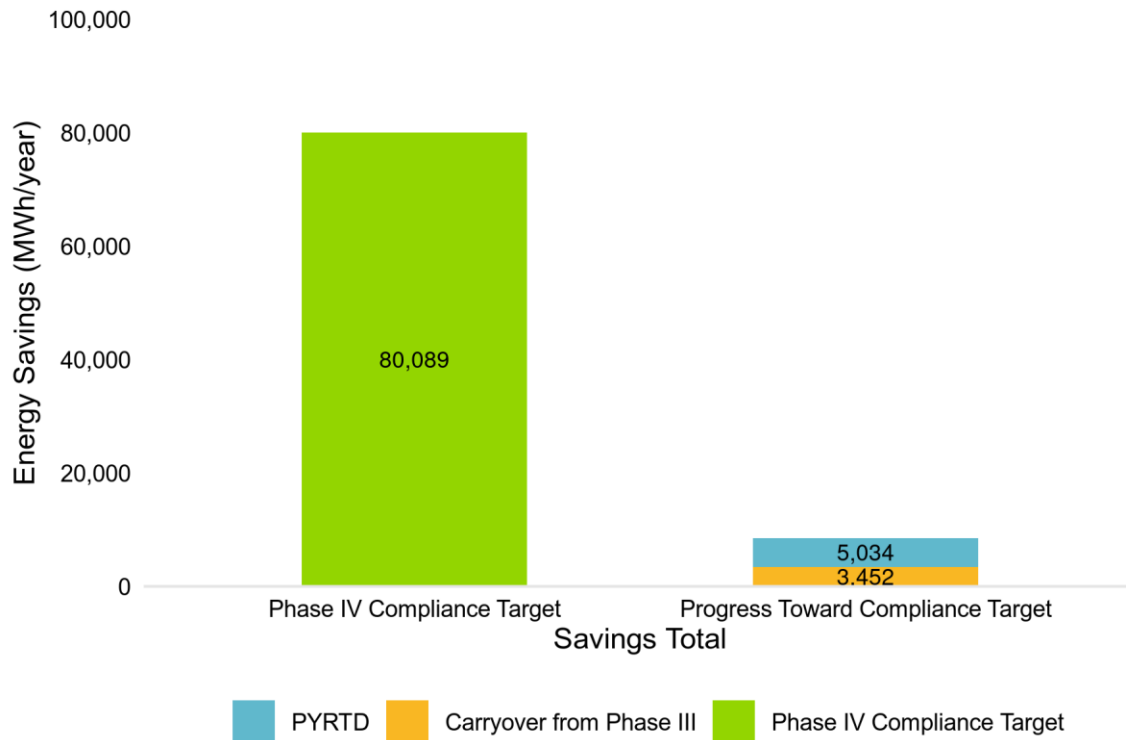
Source: Guidehouse analysis

Figure 3. Performance toward Phase IV Portfolio Peak Demand Target


Source: Guidehouse analysis

The Phase IV 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 192 EE&C measures to its Residential and Non-Residential customer classes. Of the 192 measures, 47 are available to the Low-Income customer segment at no cost to the customer. This represents 24.5% 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 5.8% of the portfolio savings goal. The Low-Income savings target for PECO is 80,089 MWh/yr and is based on verified gross savings. Figure 4 compares the PSA+CO performance to date for the Low-Income customer segment to the Phase IV savings target. Based on the latest available information, PECO has achieved 10.6% of the Phase IV Low-Income energy savings target.

Figure 4. EE&C Plan Performance toward Phase IV Low-Income Compliance Target


Source: Guidehouse analysis

2.3 Phase IV Performance by Customer Segment

Table 1 presents the participation, savings, and spending by customer sector for PY13 and Phase IV. The Residential, Small C&I, Large C&I sectors are defined by EDC tariff and the Residential Low-Income and Governmental/Educational/Nonprofit sector were defined by statute (66 Pa. C.S. § 2806.1). The Residential Low-Income segment is a subset of the Residential customer class; the GNI segment includes customers who are part of the Small C&I or Large C&I rate classes. Guidehouse removed the Low-Income and GNI segments savings, spending, and participation values from the parent Residential, Small C&I, and Large C&I sectors values in Table 1.

Table 1. PY13 and Phase IV Summary Statistics by Customer Segment

Parameter	Residential (Non-Low-Income)	Residential Low-Income	Small C&I (Non-GNI)	Large C&I (Non-GNI)	GNI	Total
No. of Participants	601,039	34,849	588	203	26	636,705
PYRTD MWh/yr	21,234	5,034	11,281	74,752	1,004	113,306
PYRTD MW/yr	5.26	0.60	2.28	12.62	0.03	20.80
Incentives (\$1,000)	1,588	916	1,913	4,608	155	9,180

Source: Guidehouse analysis

3. Updates and Findings

3.1 Implementation Updates and Findings

This section summarizes PECO's EE&C plan and program implementation updates, as well as findings available at the time of this report's writing. In PY13, PECO expects to implement the EE&C plan as filed.

PECO's EE&C plan is implemented through a customer-centric portfolio of offerings to meet its customers' energy-saving needs, regardless of customer rate class. In Phase IV, PECO offers five customer programs:

- Residential
- Residential Home Energy Reports (HER)
- Income-Eligible
- Income-Eligible HER
- Non-Residential

Within each program, PECO offers distinct program components. Programs and program components are defined as follows:

- **Programs:** A mix of measures and treatments for customers structured to include interactions with multiple market actors across the value chain through various program components. The PECO portfolio is organized into five programs.
- **Program components:** Program components tailor service delivery to the needs of each customer class. For example, the Residential program offers rebates, a marketplace platform, in-home assessments, appliance recycling, and other service components.

At the time of semiannual report, conservation service providers (CSPs) are ramping up program activities per the Phase IV EE&C plan design.

Only the Non-Residential program anticipates any significant program updates in the second half of PY13. The updates will be made in the following two components:

- Midstream will add non-lighting equipment offerings including HVAC, motors, and drives.
- Small Business Direct Install will transition to an open market implementation with any eligible contractor able to apply for and receive rebates and offer measures. The current model administered through a sole contractor will be retired.

3.2 Evaluation Updates and Findings

Guidehouse is finalizing the Phase IV evaluation plan and sampling plan for each program and component. The team will interview PECO staff and CSPs and review program tracking databases and engineering files. These activities inform the design of participant surveys exploring customer satisfaction and experience and the verification of measure installations for specific components per the evaluation plan. Guidehouse's progress on each program and component is summarized as follows:

- **Residential Program:** Guidehouse is reviewing first and second quarter data and developing sampling plans and survey instruments in support of PY13 evaluation activities.
- **Income-Eligible Residential Subsector:** Guidehouse is reviewing first and second quarter data and developing sampling plans and survey instruments in support of PY13 evaluation activities.
- **Residential HER Program:** Guidehouse is developing evaluation plans and survey instruments in support of PY13 evaluation activities.
- **Income-Eligible HER Program:** Guidehouse is developing evaluation plans and survey instruments in support of PY13 evaluation activities.
- **Non-Residential Program:** Guidehouse is reviewing first and second quarter data and developing sampling plans and survey or interview guides in support of PY13 evaluation activities.

4. Summary of Participation by Program

Participation is defined differently for certain programs depending on the program delivery channel and data tracking practices. The nuances of the participant definition vary by program and within elements of a given program. The following bullets summarize Phase IV participation counting logic by program and Table 2 provides the current participation totals for PY13 and Phase IV.

- The Residential program includes five components:
 - **Rebates and Marketplace:** Participation is a count of unique account number by program year for all except upstream lighting. For upstream lighting, participation is counted by number of measures by program year.
 - **Appliance Recycling:** Participation is a count of unique account number by program year.
 - **Multifamily:** Participation is a count of unique account number by program year. Master metered buildings with a single account number are counted as a single participant even if multiple apartments are served.
 - **In-Home Assessments:** Participation is a count of unique account number by program year.
 - **New Construction:** Participation is a count of unique job identifier by program year.
- The Income-Eligible program includes four components:
 - **Single-Family:** Participation is a count of unique account number by program year for all channels except giveaways. For giveaways, participation is counted by number of measures by program year.
 - **Appliance Recycling:** Participation is a count of unique account number by program year.
 - **Multifamily:** Participation is a count of unique account number by program year. Master metered buildings with a single account number are counted as a single participant even if multiple apartments are served.
 - **Long-Term Savings:** Participation is a count of unique account number by program year.
- The Non-Residential program includes four components:
 - **Downstream Rebates:** Participation is a count of unique account number by program year.
 - **Midstream Rebates:** Participation is a count of unique account number by program year.
 - **Small Business Direct Install:** Participation is a count of unique account number by program year.
 - **New Construction:** Participation is a count of unique account number by program year.
- The Residential HER program participation is a count of unique account number by program year.

- The Income-Eligible HER program participation is a count of unique account number by program year.

Table 2. EE&C Plan Participation by Program Component

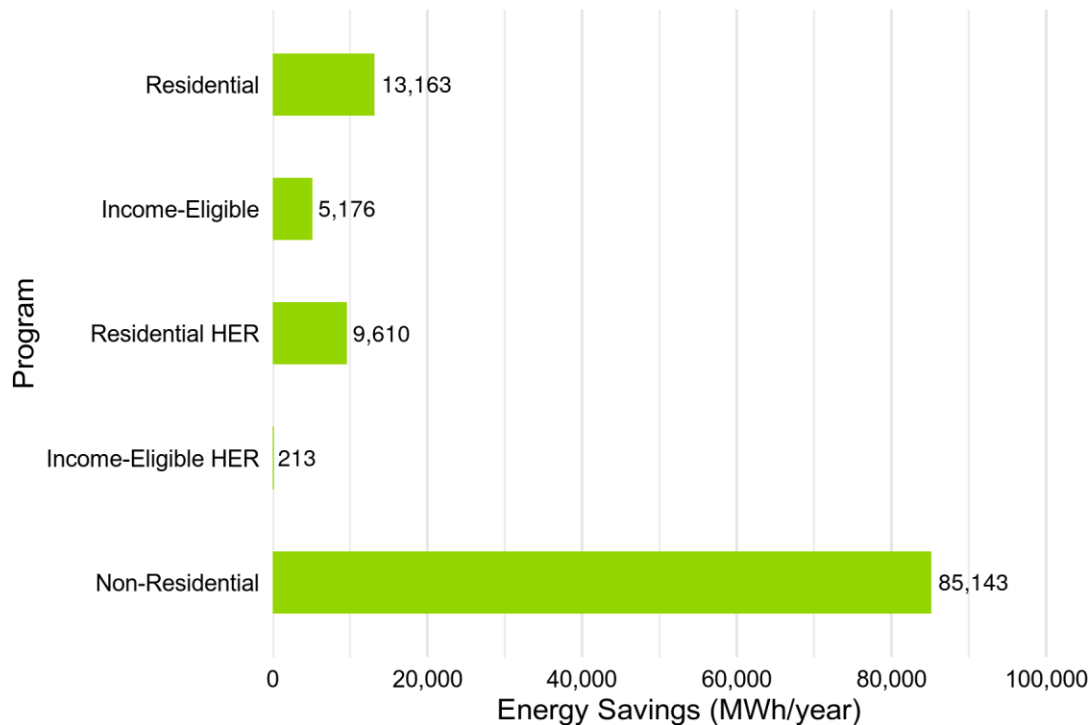
Program and Component	PYTD Participation	P4TD Participation
Rebates and Marketplace	43,365	43,365
Appliance Recycling	4,695	4,695
In-Home Assessment	1,178	1,178
New Construction	969	969
Multifamily	113	113
Residential Total	50,320	50,320
Single-Family	12,753	12,753
Appliance Recycling	480	480
Multifamily	515	515
Long-Term Savings	25	25
Income-Eligible Total	13,773	13,773
Residential HER	550,415	550,415
Income-Eligible HER	21,461	21,461
Downstream	221	221
Midstream	456	456
Small Business Direct Install	59	59
New Construction	0	0
Non-Residential Total	736	736
Portfolio Total	636,705	636,705

Source: Guidehouse analysis

5. Summary of Energy Impacts by Program

Figure 5 summarizes the PYTD reported gross energy savings by program for PY13 and Phase IV. This report presents the energy impacts at the meter level and they do not reflect adjustments for transmission and distribution losses.

Figure 5. PYTD and Phase IV Reported Gross Energy Savings by Program



Source: Guidehouse analysis

Table 3 summarizes energy impacts by program through the current reporting period.

Table 3. Energy Savings by Program (MWh/Year)

Program and Component	PYRTD	RTD	VTD	PSA
Rebates and Marketplace	5,201	5,201	0	5,201
Appliance Recycling	3,944	3,944	0	3,944
In-Home Assessment	1,238	1,238	0	1,238
New Construction	1,035	1,035	0	1,035
Multifamily	1,745	1,745	0	1,745
Residential Total	13,163	13,163	0	13,163
Single-Family	4,322	4,322	0	4,322
Appliance Recycling	393	393	0	393
Multifamily	420	420	0	420

Program and Component	PYRTD	RTD	VTD	PSA
Long-Term Savings	40	40	0	40
Income-Eligible Total	5,176	5,176	0	5,176
Residential HER	9,610	9,610	0	9,610
Income-Eligible HER	213	213	0	213
Downstream	78,507	78,507	0	78,507
Midstream	3,863	3,863	0	3,863
Small Business Direct Install	2,774	2,774	0	2,774
New Construction	0	0	0	0
Non-Residential Total	85,143	85,143	0	85,143
Portfolio Total	113,306	113,306	0	113,306

Source: Guidehouse analysis

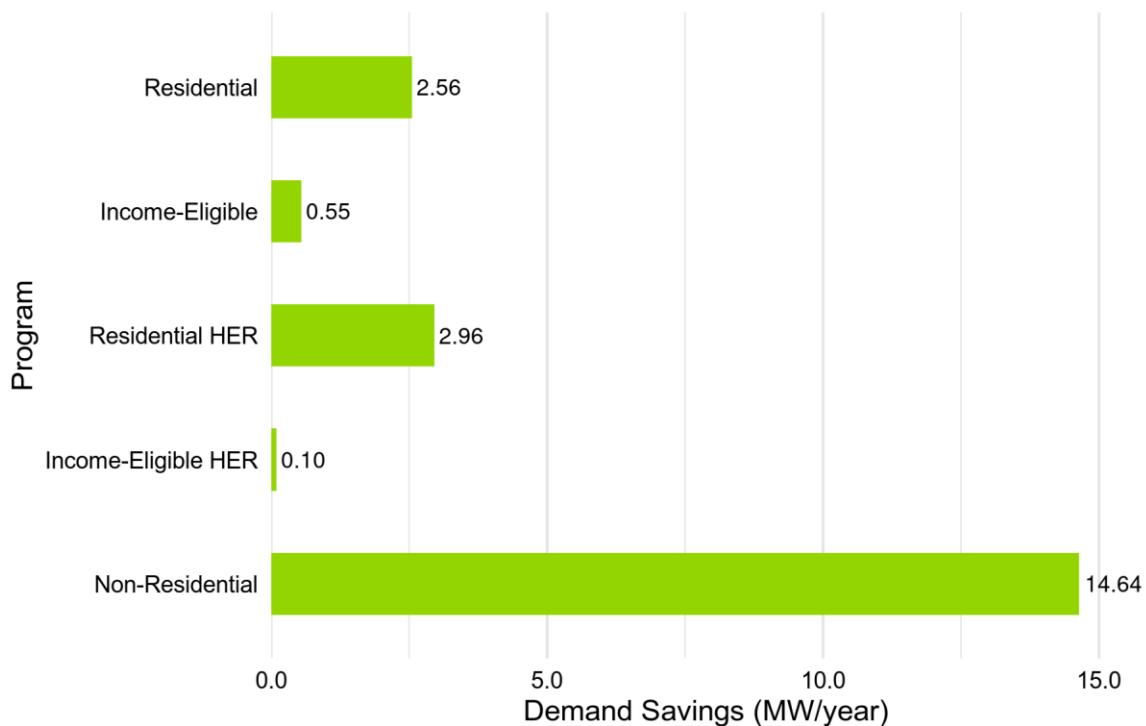
6. Summary of Peak Demand Impacts by Program

Act 129 defines peak demand savings from energy efficiency as the average expected reduction in electric demand from 2 p.m. to 6 p.m. EDT on non-holiday weekdays from June to August. This report presents the peak demand impacts from energy efficiency at the system level, meaning they reflect adjustments for transmission and distribution losses. PECO uses the following line loss percentages or multipliers by sector:

- Residential = 1.0799
- Non-Residential = 1.0799

Figure 6 summarizes the PYRTD reported gross peak demand savings by energy efficiency program for PY13 at the system level with the application of line loss factors. PYRTD is also the Act 129 Phase IV PSA gross peak demand savings for this PY13 Semiannual Report.

Figure 6. PYRTD Gross Peak Demand Savings by Program



Source: Guidehouse analysis

Table 4 summarizes the peak demand impacts by program through the current reporting period.

Table 4. Peak Demand Savings by Program (MW/Year)

Program and Component	PYRTD	RTD	VTD	PSA
Rebates and Marketplace	0.86	0.86	0.00	0.86
Appliance Recycling	0.81	0.81	0.00	0.81
In-Home Assessment	0.15	0.15	0.00	0.15

Program and Component	PYRTD	RTD	VTD	PSA
New Construction	0.46	0.46	0.00	0.46
Multifamily	0.28	0.28	0.00	0.28
Residential Total	2.56	2.56	0.00	2.56
Single-Family	0.42	0.42	0.00	0.42
Appliance Recycling	0.08	0.08	0.00	0.08
Multifamily	0.05	0.05	0.00	0.05
Long-Term Savings	0.00	0.00	0.00	0.00
Income-Eligible Total	0.55	0.55	0.00	0.55
Residential HER	2.96	2.96	0.00	2.96
Income-Eligible HER	0.10	0.10	0.00	0.10
Downstream	13.41	13.41	0.00	13.41
Midstream	0.83	0.83	0.00	0.83
Small Business Direct Install	0.40	0.40	0.00	0.40
New Construction	0.00	0.00	0.00	0.00
Non-Residential Total	14.64	14.64	0.00	14.64
Portfolio Total	20.80	20.80	0.00	20.80

Source: Guidehouse analysis

7. Summary of Finances

This section summarizes the expenditures associated with PECO's portfolio and the recovery of those costs from ratepayers.

7.1 Program and Portfolio Financials

Table 5 shows program-specific and portfolio total finances for PY13. The columns in Table 5 and Table 6 are adapted from the list of program cost elements in the PA PUC's EE&C plan template² for Phase IV. So far in PY13, 41% of all EE&C plan expenditures have been incentives to participants and trade allies. For this first year of Phase IV, program-specific and portfolio total finances since inception of Phase IV are the same as those reported for PY13:

- Incentives includes rebates, point-of-sale buydowns, kits, and direct install materials and labor.
- EDC materials, labor, and administration includes costs associated with an EDC's own employees.
- ICSP materials, labor, and administration includes the program implementation contractor and the costs of any other outside vendors an EDC employs to support program delivery.

Table 5. Program Year to Date Financials (\$1,000)

Program	Incentives	EDC Materials, Labor, and Administration	CSP Materials, Labor, and Administration	Total Cost
Residential	1,603	0	1,509	3,111
Income-Eligible	1,709	0	470	2,178
Residential HER	0	0	643	643
Income-Eligible HER	0	0	14	14
Non-Residential	6,549	0	5,534	12,083
Common Portfolio Costs³				5,466
Portfolio Total	9,860	0	8,170	23,495
SWE Costs⁴	N/A	N/A	N/A	400
Total	9,860	0	8,170	23,895

Source: Guidehouse analysis

Cost-effectiveness testing for Act 129 EE&C programs is performed using the total resource cost (TRC) test. Benefit-cost modeling is conducted annually using verified gross and verified net savings once the results of the independent impact evaluation are completed. TRC test

² Energy Efficiency and Conservation Plan Template. <https://www.puc.pa.gov/pcdocs/1676672.docx>. PA PUC. September 9, 2020.

³ Common Portfolio Cost include EDC administrative costs, marketing, and EM&V.

⁴ Statewide Evaluation costs are outside of the 2% spending cap.

results for PY13 will be presented in the final annual report to the PA PUC on September 30, 2022 along with a more granular breakdown of portfolio costs.

7.2 Cost Recovery

Act 129 allows Pennsylvania EDCs to recover EE&C plan costs through a cost recovery mechanism. PECO's cost recovery charges are organized separately by 4 customer sectors to ensure the electric rate classes that finance the programs are the rate classes that receive the direct energy and conservation benefits. Cost recovery is necessarily tied to the way customers are metered and charged for electric service. Readers should be mindful of the differences between Table 6 and Section 2.3. For example, the Low-Income customer segment is a subset of PECO's residential tariff(s) and is not listed in Table 6.

Table 6. EE&C Plan Expenditures by Cost Recovery Category⁵

Cost Recovery Sector	Rate Classes Included	PYTD Spending (\$1,000)	P4TD Spending (\$1,000)
Residential	R + RH, CAP	8,872	8,872
Small Commercial	GS	3,790	3,790
Large Commercial	PD, HT + EP	10,801	10,801
Municipal	SLE, SLC, AL & TLCL	32	32
Portfolio Total		23,495	23,495

Source: Guidehouse analysis

⁵ Excludes SWE costs