



Semiannual Report to the Pennsylvania Public Utility Commission

Phase III of Act 129

Program Year 11

(June 1, 2019 – May 31, 2020)

For Pennsylvania Act 129 of 2008

Energy Efficiency and Conservation Plan

Prepared for:



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ACRONYMS

AC	Air Conditioner
BDR	Behavioral Demand Response
C&I	Commercial and Industrial
CFL	Compact Fluorescent Lamp
CHP	Combined Heat and Power
CSP	Conservation Service Provider or Curtailment Service Provider
DLC	Direct Load Control
DR	Demand Response
DRA	Demand Response Aggregator
EDC	Electric Distribution Company
EDT	Eastern Daylight Time
EE	Energy Efficiency
EE&C	Energy Efficiency and Conservation
EM&V	Evaluation, Measurement, and Verification
EPA	Environmental Protection Agency
EUL	Effective Useful Life
G/E/NP	Government/Education/Non-Profit
HVAC	Heating, Ventilation, and Air Conditioning
ICSP	Implementation Conservation Service Provider
kW	Kilowatt
kWh	Kilowatt-Hour
LED	Light-Emitting Diode
LI	Low-Income
LIURP	Low-Income Usage Reduction Program
M&V	Measurement and Verification
MW	Megawatt
MWh	Megawatt-Hour
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 + PYTD
PSA+CO	PSA plus Carryover from Phase II
PY	Program Year: e.g., PY8, from June 1, 2016, to May 31, 2017
PYRTD	Program Year Reported to Date
PYTD	Program Year to Date
PYVTD	Program Year Verified to Date
RTD	Phase III to Date Reported Gross Savings
RTO	Regional Transmission Organization
SKU	Stock Keeping Unit

SWE	Statewide Evaluator
T&D	Transmission and Distribution
TRC	Total Resource Cost
TRM	Technical Reference Manual
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 estimate 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 provider (ICSP) and stored in the program tracking system.

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 application of 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 megawatt-hours (MWh) or megawatts (MW). 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.

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 (EUL). 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.

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.

- **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.
- **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.
- **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 example, for Program Year 11 (PY11), the PSA savings equal the PYTD savings and the verified savings from PY8, PY9, and PY10.
- **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.

Per guidance from the Pennsylvania Statewide Evaluator (SWE), all demand savings that were achieved from energy efficiency measures are shown in this report without line losses (i.e., at the meter). All demand savings that were achieved from demand response (DR) measures are shown in this report with line losses (i.e., at the generator).

Note that all values in the report are summed prior to rounding. Therefore, table totals may not equal the sum of all rows.

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 Utility 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 of the Phase III EE&C accomplishments for PECO in Program Year 11 (PY11), as well as the cumulative accomplishments of the Phase III programs since inception. This report also 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, and reported gross impacts of the energy efficiency (EE) programs in PY11. Compliance with Act 129 savings goals will ultimately be based on verified gross savings. PECO has retained Guidehouse, Inc. (Guidehouse) as an independent evaluation contractor for Phase III of Act 129. Guidehouse is responsible for the measurement and verification (M&V) of the savings and the calculation of verified gross savings. The verified gross savings for PY11 EE programs will be reported in the final annual report to be filed on February 15, 2021.

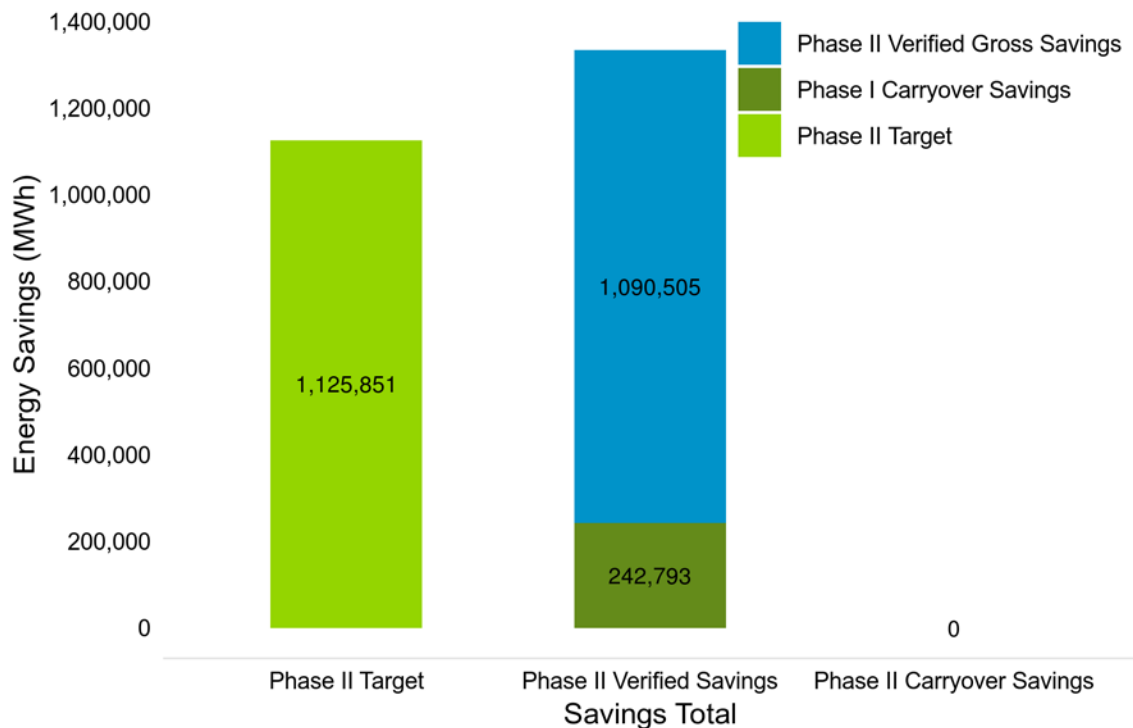
Phase III of Act 129 includes a demand response (DR) goal for PECO. DR events are limited to the months of June through September, which are the first 4 months of the Act 129 program year. Because the DR season is completed early in the program year, it is possible to complete the independent evaluation of verified gross savings for DR sooner than is possible for EE programs. Section 6.2 of this report includes the verified gross DR impacts for PY11 and the cumulative DR performance of the EE&C program to date for Phase III of Act 129.

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 Order¹ allowed EDCs to carryover savings achieved within Phase II that were in excess of the Phase II portfolio savings target. Phase I carryover savings cannot be counted in the 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.²

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



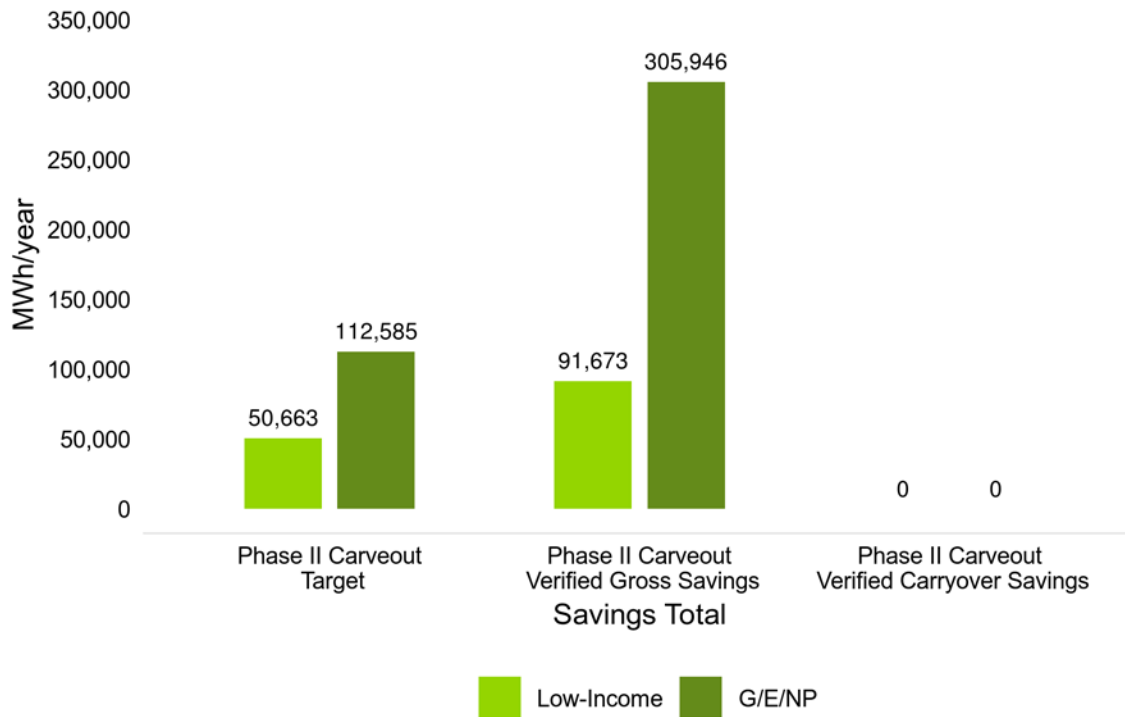
Sources: PECO's eTrack database, Conservation Service Provider (CSP) tracking data

¹ 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.

² 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.

The Commission’s Phase III Implementation Order³ 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 low-income customer segment.⁴ PECO carried over 0 MWh of G/E/NP and 0 MWh of low-income customer segment savings.⁵ Figure 2-2 shows the calculation of carryover savings for the low-income and G/E/NP targets.⁶

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



Sources: PECO’s eTrack database, CSP tracking data

2.2 Phase III Energy Efficiency Achievements to Date

Since the beginning of PY11 on June 1, 2019, PECO has claimed:

- 460,894 MWh of reported gross electric energy savings (PYRTD)
- 54.88 MW of reported gross peak demand savings (PYRTD) from EE programs

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

³ 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.

⁴ Proportionate to those savings achieved by dedicated low-income programs in Phase III.

⁵ 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.

⁶ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Compliance Order*, 2017.

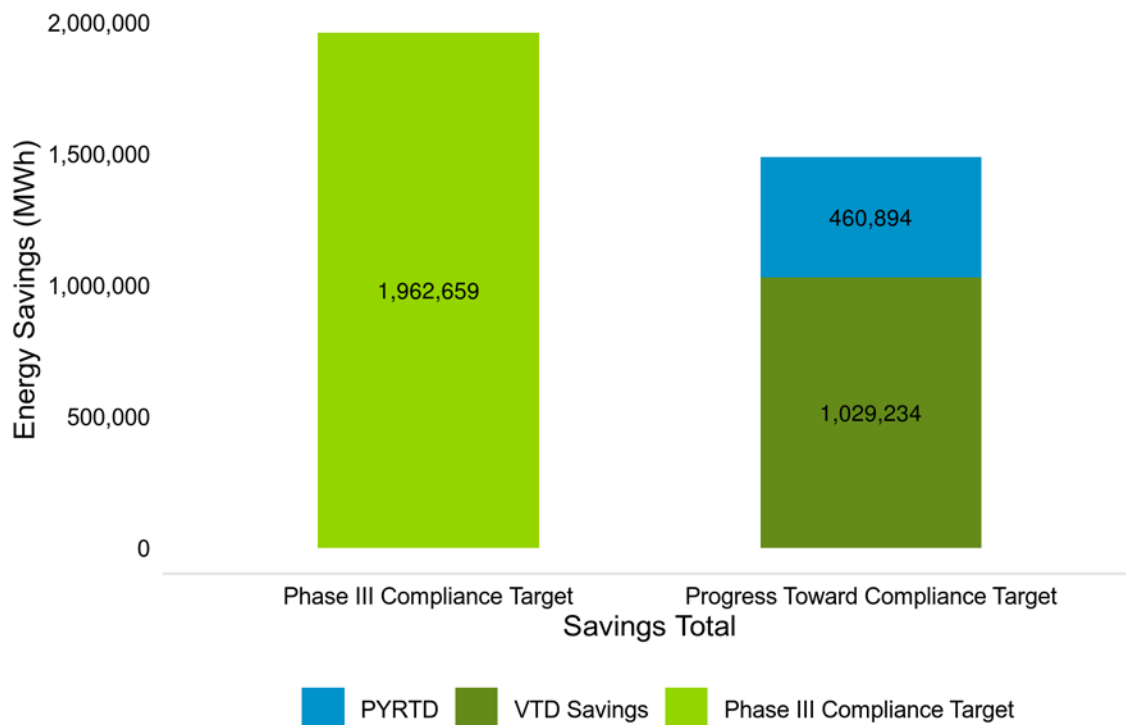
- 1,510,582 MWh of reported gross electric energy savings (RTD)
- 166.65 MW of reported gross peak demand savings (RTD) from EE programs
- 1,490,128 MWh of gross electric energy savings (PSA)⁷
 - This total includes verified gross savings from all Phase III program years and the PYTD reported gross savings from PY11
- 191.46 MW of gross peak demand savings (PSA) from EE programs

Including carryover savings from Phase II, PECO has achieved:

- 1,490,128 MWh of PSA+CO energy savings recorded to date in Phase III
 - This represents 75.9% 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.

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



Sources: PECO's eTrack, CSP tracking data

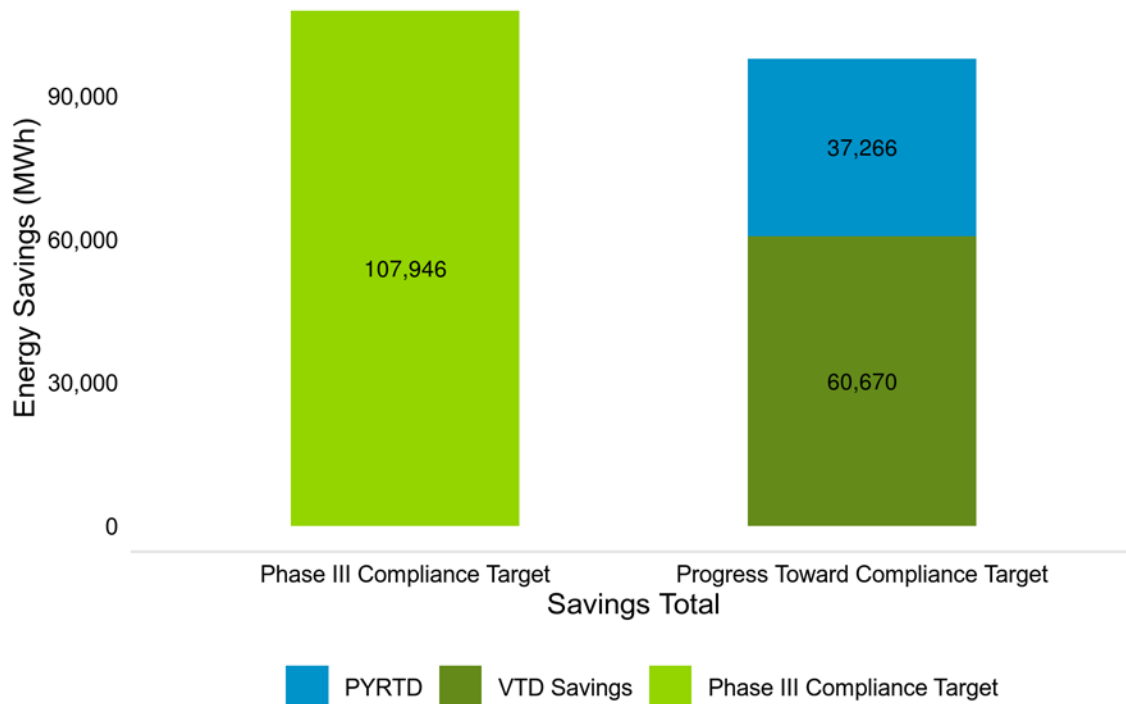
The Phase III Implementation Order directed EDCs to offer conservation measures to the low-income customer segment based on the proportion of electric sales attributable to low-income households. The proportionate number of measures targeted for PECO is 8.8%. PECO offers a total of 269 EE&C

⁷ The SWE adjusted PY10 verified gross energy (MWh) and demand (MW) savings filed in PECO's PY10 Annual Report. Those adjustments are reflected throughout this report in the relevant phase-to-date values. At the overall portfolio level, the SWE increased PY10 verified gross energy savings by 623 MWh and increased verified gross demand savings by 0.08 MW.

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 target.

The PA PUC also established a low-income energy savings target of 5.5% of the portfolio savings goal. The Phase III low-income savings target for PECO is 107,946 MWh. Figure 2-4 compares the PSA+CO performance to date for the low-income customer segment to the Phase III savings target. Based on the latest available information, PECO has achieved 90.7% of the Phase III low-income energy savings target.

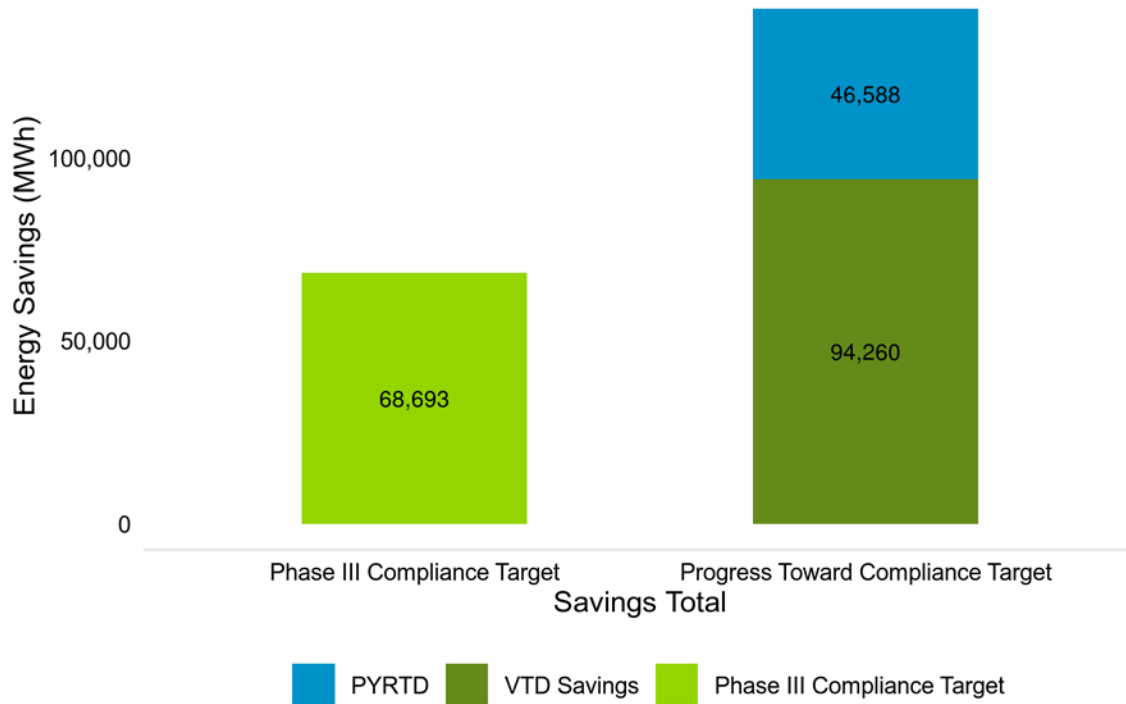
Figure 2-4. EE&C Plan Performance Toward Phase III Low-Income Compliance Target⁸



Sources: PECO's eTrack database, CSP tracking data

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. Figure 2-5 compares the PSA+CO performance to date for the G/E/NP customer segment to the Phase III savings target. Based on the latest available information, PECO has achieved 205.0% of the Phase III G/E/NP energy savings target.

⁸ The SWE adjusted the PY10 verified gross energy (MWh) savings contributing to the low-income target that are filed in PECO's PY10 Annual Report. The SWE decreased PY10 verified gross energy savings by 68 MWh.

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


Sources: PECO's eTrack database, CSP tracking data

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 (T&D) 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.

In PY11, PECO called four DR events, on July 17, July 18, July 19, and August 19. The average performance for these four events is presented in Table 2-1. The full methodology and results are available in the standalone PY11 DR report, submitted to the Statewide Evaluator (SWE) on January 15, 2020. Table 2-1 shows a summary of the DR performance to date.

Table 2-1. Phase to Date DR Performance by Event

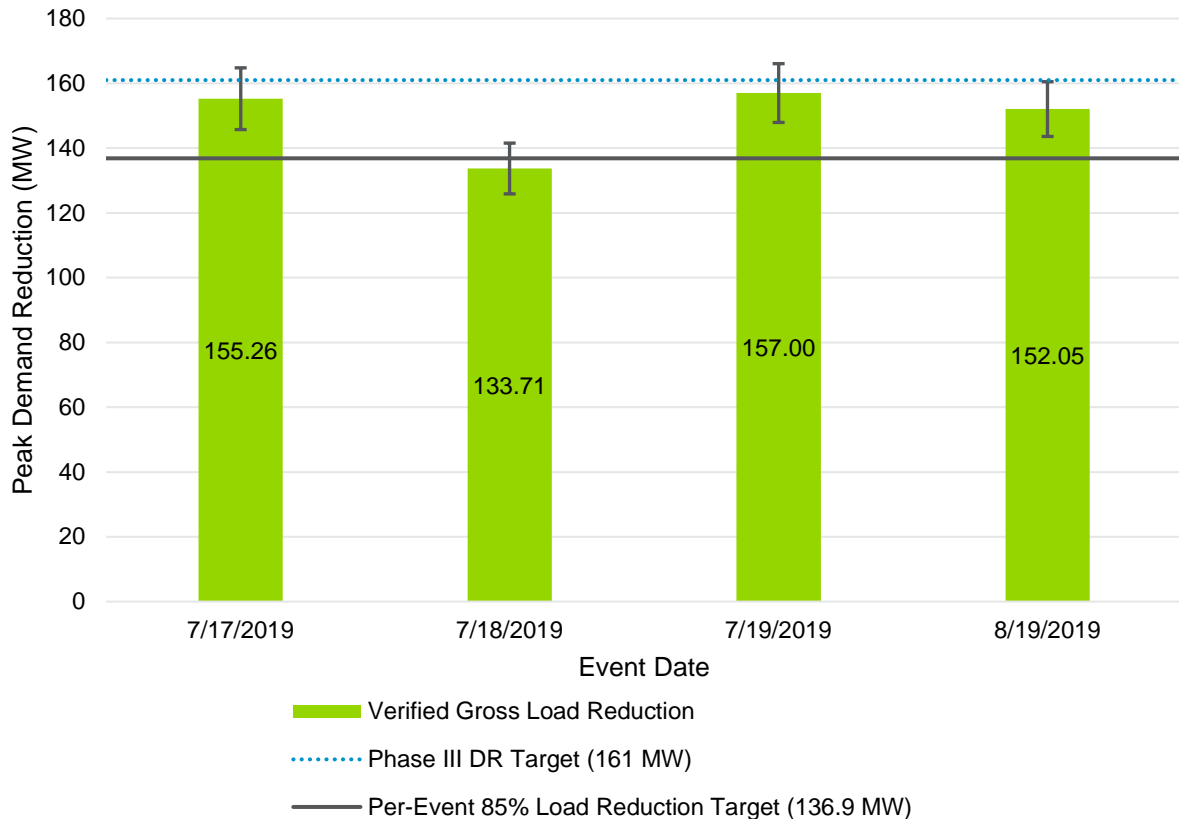
PY	Event Date	Residential DR (MW)	Small C&I DR (MW)	Large C&I DR (MW) ^{9, 10}	Portfolio (MW)	Relative Precision at 90% Confidence
PY9	June 13, 2017	39.53	0.00	127.97	167.50	10.9%
PY9	July 20, 2017	33.48	0.00	121.89	155.37	11.0%
PY9	July 21, 2017	23.34	0.00	140.83	164.17	10.3%
PY10	July 2, 2018	38.93	0.00	149.25	188.18	10.2%
PY10	July 3, 2018	33.84	0.00	144.67	178.51	10.7%
PY10	August 6, 2018	25.07	1.15	175.12	201.34	10.6%
PY10	August 28, 2018	30.69	0.92	159.52	191.12	11.3%
PY10	September 4, 2018	29.99	0.77	137.79	168.55	11.4%
PY10	September 5, 2018	29.52	0.84	129.54	159.91	11.9%
PY11	July 17, 2019	34.36	0.86	120.04	155.26	6.1%
PY11	July 18, 2019	11.06	1.02	121.63	133.71	5.9%
PY11	July 19, 2019	34.93	1.18	120.89	157.00	5.8%
PY11	August 19, 2019	24.90	0.98	126.17	152.05	5.6%
PYVTD - Average PY11 DR Event Performance		26.31	1.01	122.18	149.50	5.9%
P3TD - Average Phase III DR Event Performance		29.97	0.59	136.56	167.13	10.0%

Source: Guidehouse analysis

The Commission's Phase III Implementation Order also established a requirement that EDCs achieve at least 85% of the Phase III compliance reduction target in each DR event. For PECO, this translates to a 136.9 MW minimum for each DR event. Figure 2-6 compares the performance of each of the DR events in PY11 to the event-specific minimum and average targets. PECO exceeded the 85% minimum target for all events in PY11 except for the second event on July 18, 2019. The July 18 event had lower residential impacts than any other Phase III event to date because the weather on this day was considerably milder than for other events. The high reached just over 85°F around 12 p.m. and quickly fell throughout the afternoon with temperatures in the low 80s during the event hours from 3 to 7 p.m.; each of the other three event days had temperatures in the 90s during the event hours. Savings were low for the residential sector during this event as residential loads are more weather sensitive than the small or large C&I sectors.

⁹ Verified impacts for the Large C&I DR program for PY9, PY10, and PY11 have been revised based on corrected interval data provided by PECO. In January 2020, PECO notified Guidehouse of potential issues with the interval data provided for the PY9 through PY11 evaluations, where certain data may not represent actual consumption due to unique meter configurations at different participant sites. After a comprehensive review of all sites and activities to-date, the team found that in total 16, 25, and 6 sites were affected in PY9, PY10, and PY11, respectively. At the request of PECO and in consultation with the SWE, Guidehouse applied evaluation methods prescribed for PY11 to revise verified impacts for affected sites; impacts for unaffected sites remain unchanged. These revisions increased PVTVD by 1.1 MW (0.7%) and P3TD by 1.6 MW (1.0%).

¹⁰ Per SWE feedback, Guidehouse has also revised PY11 Large C&I verified impacts to exclude holidays from estimation data for all sites. This revision results in a <1% change in impacts relative to prior results.

Figure 2-6. Event Performance Compared to 85% Per-Event Target


Source: Guidehouse analysis

2.4 Phase III Performance by Customer Segment

Table 2-2 presents the participation, savings, and spending by customer sector for PY11. The residential, small commercial and industrial (C&I), and large C&I sectors are defined by EDC tariff, and the residential low-income and G/E/NP customer segment carve-outs are defined by statute (66 Pa. C.S. § 2806.1). The residential low-income segment is a subset, and not additive, of the residential customer class; however, some low-income savings may occur on a small C&I or large C&I meter due to participation of low-income occupants living in multifamily, master-metered buildings. Similar to the low-income segment, the G/E/NP customer segment will include customers who are part of the small C&I or large C&I rate classes and is not additive to the portfolio. Table 2-2 represents the cumulative savings, spending, and participation by customer sector, inclusive of all low-income and G/E/NP participation. Table 2-3 represents the savings, spending, and participation values for the low-income and G/E/NP customer segment carve-outs only.

Table 2-2. PY11 Summary Statistics by Customer Segment

Customer Segment	Parameter				
	No. of Participants	PYRTD MWh	PYRTD MW (EE)	PYVTD MW (DR)	Incentives (\$1,000)
Residential	1,670,895	272,342	26.38	26.31	\$8,904
Small C&I	5,286	70,411	11.25	1.01	\$4,135
Large C&I	2,602	118,141	17.25	122.50	\$7,123
Total	1,678,783	460,894	54.88	149.50	\$20,162

Sources: PECO's eTrack database, CSP tracking data

Table 2-3. PY11 Summary Statistics by Carve-Out

Carve-Out	Parameter				
	No. of Participants	PYRTD MWh	PYRTD MW (EE)	PYVTD MW (DR)	Incentives (\$1,000)
Low-Income (0-50% of FPL)	2,935	3,330	0.36	0.0	\$0
Low-Income (51-150% of FPL)	11,601	33,936	3.99	0.0	\$170
G/E/NP	3,911	46,588	7.13	0.0	\$3,476

Sources: PECO's eTrack database, CSP tracking data

Table 2-4 and Table 2-5 summarize plan performance by sector and customer segment carve-outs since the beginning of Phase III.

Table 2-4. Phase III Summary Statistics by Customer Segment

Customer Segment	Parameter				
	No. of Participants	PSA MWh	PSA MW (EE)	PSA MW (DR)	Incentives (\$1,000)
Residential	5,967,482	953,919	112.90	29.97	\$39,672
Small C&I	10,414	200,447	30.24	0.59	\$10,427
Large C&I	4,296	335,763	48.32	136.56	\$18,147
Total	5,982,192	1,490,128	191.46	167.13	\$68,246

Sources: PECO's eTrack database, CSP tracking data

Table 2-5. Phase III Summary Statistics by Carve-Out

Carve-Out	Parameter				
	No. of Participants	PSA MWh	PSA MW (EE)	PSA MW (DR)	Incentives (\$1,000)
Low-Income (0-50% of FPL)	11,151	12,779	1.44	0.0	\$1
Low-Income (51-150% of FPL)	208,974	85,156	10.03	0.0	\$1,203
G/E/NP	5,401	140,849	19.76	0.0	\$9,303

Sources: PECO's eTrack database, CSP tracking data

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. PECO's EE&C Plan remains generally unchanged through the second half of PY11.

- **Residential EE Program:** The residential program continues to represent the majority of savings in the portfolio in PY11. The program includes multiple solutions that are implemented by ARCA, CLEARResult, Franklin, Oracle and PSD.
 - **Behavioral Solution:** Oracle implements the Behavioral Solution and has been active since PY8. Similar to PY10, the Behavioral Solution continues to represent a significant portion of the Residential EE Program reported savings.
 - **Lighting, Appliance & HVAC Solution:** The Lighting, Appliance & HVAC Solution, implemented by CLEARResult, continues to represent a significant portion of the Residential EE Program's reported savings. The solution assists customers to purchase the most efficient technology when shopping for new products including LED lighting, central air conditioners, central heat pumps, ENERGY STAR refrigerators, and high efficiency furnace fans. The solution also distributes education materials to increase customer awareness and acceptance. Incentives are provided through multiple pathways:
 - **Upstream Incentives:** Point of purchase discounts to increase the market share of ENERGY STAR qualified LEDs;
 - **Downstream Incentives:** Rebates for appliances sold through retail and HVAC installer channels;
 - **Marketplace:** Launched in PY10, provides an online purchase option with instant discounts for ENERGY STAR qualified LEDs, advanced power strips, and eligible programmable thermostats.
 - **Appliance Recycling Solution:** The Appliance Recycling Solution, implemented by ARCA, offers rebates for refrigerators, freezers, and room air conditioners (ACs). The utility offers \$75 rebates for each working refrigerator or freezer picked up for recycling. The utility offers \$10 rebates per room AC recycled with the pickup of a refrigerator or freezer.
 - **Whole Home Solution:** The Whole Home Solution, implemented by CLEARResult, offers participants a low-cost home energy assessment that includes direct installation of a range of deemed measures such as lighting, water conservation, smart strips, etc. In addition, the Whole Home Solution provides incentives for ceiling, attic, and wall insulation, air and duct sealing, and mechanical equipment (e.g., fuel switching from electric heat to natural gas heat pump water heaters).
 - **Multifamily Targeted Market Segment:** The Multifamily Targeted Market Segment includes projects and savings related to residential EE occurring within the dwellings of multifamily buildings. The projects and savings for master-metered multifamily facilities are allocated to the Small C&I EE and Large C&I EE Programs. Franklin Energy implements the Multifamily Solution.

- **New Construction Solution:** The Residential New Construction Solution's activities continue to represent a smaller share of the Residential EE Program's savings activities. This solution is intended to accelerate the adoption of EE in the design, construction, and operation of new single-family homes, duplexes, and townhomes by leveraging the US Environmental Protection Agency's (EPA's) ENERGY STAR Homes certification. The program also includes an additional above-code track (Code-Plus) designed to transition builders toward ENERGY STAR standards. The New Construction Solution is implemented by PSD.
- **Low-Income EE Program:** CMC Energy Services and ARCA, Inc. implement the Low-Income Whole Home Solution in PY11. The Energy Coordinating Agency (ECA) provided implementation services in PY10; ECA did not contribute to the program in PY11.
 - **Whole Home Solution:** The Whole Home Solution encompasses several activities to deliver energy savings services to income eligible households including PECO's Free Home Energy Check Up with free measure direct installation, low-income multifamily building audit and measure direct installation, appliance recycling, and distribution of free energy efficiency products at events targeting income eligible households. For customers with electric heat and domestic hot water, Home Energy Check Up measures include improving mechanical systems, water heaters and the thermal performance of building envelopes. Additionally, the solution supports the Low-Income Usage Reduction Program (LIURP) and Philadelphia Gas Works income-eligible weatherization program providing additional free efficient electric EE products for direct installation.
 - **Lighting Solution:** The Lighting Solution was closed on December 31, 2017.
- **Small C&I EE Program:** ICF, Franklin, and SmartWatt have implemented projects in three of the program's solutions and two targeted market segments: Equipment and Systems Solution, New Construction Solution, Whole Building Solution, Multifamily Targeted Market Segment, and the Data Center Targeted Market Segment. Each of these solutions typically includes a mixture of lighting improvements, lighting controls, HVAC, compressed air, refrigeration, and custom projects. The Equipment and Systems Solution targets existing buildings, while the New Construction Solution is for new buildings and major retrofits. The Whole Building Solution encourages direct-install projects that target entire facilities, while the Multifamily Targeted Market Segment focuses on the commercially metered common areas in multifamily residential buildings.
- **Large C&I EE Program:** ICF and Franklin have implemented projects in two of the program's solutions and two targeted market segments: Equipment and Systems Solution, New Construction Solution, Multifamily Targeted Market Segment, and the Data Center Targeted Market Segment. Each of these solutions typically includes a mixture of lighting improvements, lighting controls, HVAC, compressed air, refrigeration, and custom projects. The Equipment and Systems Solution targets existing buildings, while the New Construction Solution is for new buildings and major retrofits. The Multifamily Targeted Market Segment focuses on the commercially metered common areas in multifamily residential buildings, while the Data Center Targeted Market Segment primarily targets efficient HVAC projects in data centers and other IT facilities.
- **CHP Program:** PECO is currently accepting and processing applications for combined heat and power (CHP) projects. The program is tracking several projects that have projected completion dates within Phase III including two megawatt-scale projects with a relatively high certainty of completion during the Phase.
- **Residential DR Program:** The Residential DR Program ran four DR events during the summer of 2019: July 17, July 18, July 19, and August 19. As in years past, the program is implemented

by Itron. This year, and for the remainder of Phase III, the incentive is \$40 per direct load control (DLC) unit per year.

- **Small C&I DR Program:** The Small C&I DR Program ran four DR events during the summer of 2019: July 17, July 18, July 19, and August 19. As in years past, the program is implemented by Itron. This year, and for the remainder of Phase III, the incentive is \$40 per thermostat per year.
- **Large C&I DR Program:** The Large C&I DR Program ran four DR events during the summer of 2019: July 17, July 18, July 19, and August 19. The program is implemented by two CSPs: CPower and EnelX.

3.2 Evaluation Updates and Findings

Guidehouse has written, received SWE comments, and revised the Phase III evaluation plan and sampling plan for each program and solution. The team has conducted interviews with PECO staff and CSPs and is reviewing program tracking databases and engineering files for each solution. These activities inform the design of participant surveys exploring customer satisfaction and experience, and the verification of measure installations for specific solutions per the evaluation plan. Guidehouse's progress on each program and solution is summarized below.

- **Residential EE Program:** Guidehouse updated the evaluation plan ahead of the PY11 activities for the Residential EE Program's solutions. In consultation with the SWE, Guidehouse is planning to conduct phone verifications in place of onsite verifications, reflecting current social distancing recommendations. Data collection tools and processes to aid phone verification research for PY11 are currently being finalized. Activities from PY8, PY9, and PY10, recent findings and conclusions, and SWE feedback inform the team's research plan updates for PY11 that support both impact and process evaluation efforts.
- **Low-Income EE Program:** Guidehouse updated the evaluation plan ahead of the PY11 activities for the Residential EE Program's solutions. In consultation with the SWE, Guidehouse is planning to conduct phone verifications in place of onsite verifications, reflecting current social distancing recommendations. Data collection tools and processes to aid phone verification research for PY11 are currently being finalized. Activities from PY8, PY9, and PY10, recent findings and conclusions, and SWE feedback inform the team's research plan updates for PY11 that support both impact and process evaluation efforts.
- **Small C&I EE Program:** Guidehouse updated its data collection tools and processes to ensure faster and more robust data collection, as well as more collaboration with the SWE. Impact evaluations for all solutions are ongoing. Over the next several months, Guidehouse will continue to review the solution measure data, call and visit sampled project sites, and continue the evaluation process for PY11. The evaluation for the Whole Building solution uses an "opt-in" approach, in which all customers will be invited to complete an online verification form. Guidehouse will confirm customer answers with either a telephone call back or onsite visit as outlined in the sampling plan. Guidehouse will determine whether to conduct on-site, virtual, or phone verifications based on the status of PA public health guidelines during the evaluation period and guidance from the SWE in their Evaluation Framework addendum.¹¹
- **Large C&I EE Program:** Guidehouse updated its data collection tools and processes to ensure faster and more robust data collection as well as more collaboration with the SWE. Guidehouse has also been working with ICF to review large and complex projects before incentives will be

¹¹ Memorandum "PY11 EM&V and the Coronavirus Outbreak", The Pennsylvania Statewide Evaluation (SWE) Team, June 3, 2020

reserved. Impact evaluations for all solutions are ongoing. Over the next several months, Guidehouse will review the solution measure data, call and visit sampled project sites, and continue the evaluation process for PY11. Guidehouse will determine whether to conduct on-site, virtual, or phone verifications based on the status of PA public health guidelines during the evaluation period and guidance from the SWE in their Evaluation Framework addendum.¹²

- **CHP Program:** The CHP Program had one participant in PY11 and expects additional projects to be completed during PY12. Prior targeted research by Guidehouse found that CHP projects take 18-24 months to construct which limits the ability of the program to recruit new participants able to complete projects within Phase III.
- **Residential DR Program:** The team evaluated peak load reductions for DR events on all summer event days in 2019. Peak load reduction evaluation findings are reported in the separate DR Annual Report.
- **Small C&I DR Program:** The team evaluated peak load reductions for DR events on all summer event days in 2019. Peak load reduction evaluation findings are reported in the separate DR Annual Report.
- **Large C&I DR Program:** The team evaluated peak load reductions for DR events on all summer event days in 2019. Peak load reduction evaluation findings are reported in the separate DR Annual Report.

¹² Memorandum "PY11 EM&V and the Coronavirus Outbreak", The Pennsylvania Statewide Evaluation (SWE) Team, June 3, 2020

4. SUMMARY OF PARTICIPATION BY PROGRAM

Table 4-1 provides the current participation totals for PY11 and Phase III. Certain programs and solutions define participation differently depending on the delivery channel and data tracking practices. Appendix A includes an overview of the different participation definitions by program and solution.

Table 4-1. EE&C Plan Participation by Program

Program and Solution	PYTD Participation	P3TD Participation
Lighting, Appliance & HVAC	1,198,349	4,000,925
Behavioral	372,724	1,576,831
Appliance Recycling	17,518	59,264
Whole Home	5,230	19,158
Multifamily Targeted	8,315	28,759
Residential New Construction	885	2,462
Residential EE Program	1,603,021	5,687,399
Whole Home	14,536	53,067
Lighting	0	167,058
Low Income EE Program	14,536	220,125
Equipment & Systems	3,013	5,920
Whole Building	242	967
C&I New Construction	93	216
Multifamily Targeted	96	449
Data Center Targeted	0	2
Small C&I EE Program	3,444	7,554
Equipment & Systems	2,126	3,430
C&I New Construction	42	143
Multifamily Targeted	37	157
Data Center Targeted	0	4
Large C&I EE Program	2,205	3,734
Combined Heat & Power Program	1	6
Residential DR Program	53,924	61,440*
Small C&I DR Program	1,312	1,586*
Large C&I DR Program	340	348*
Portfolio Total	1,678,783	5,982,192

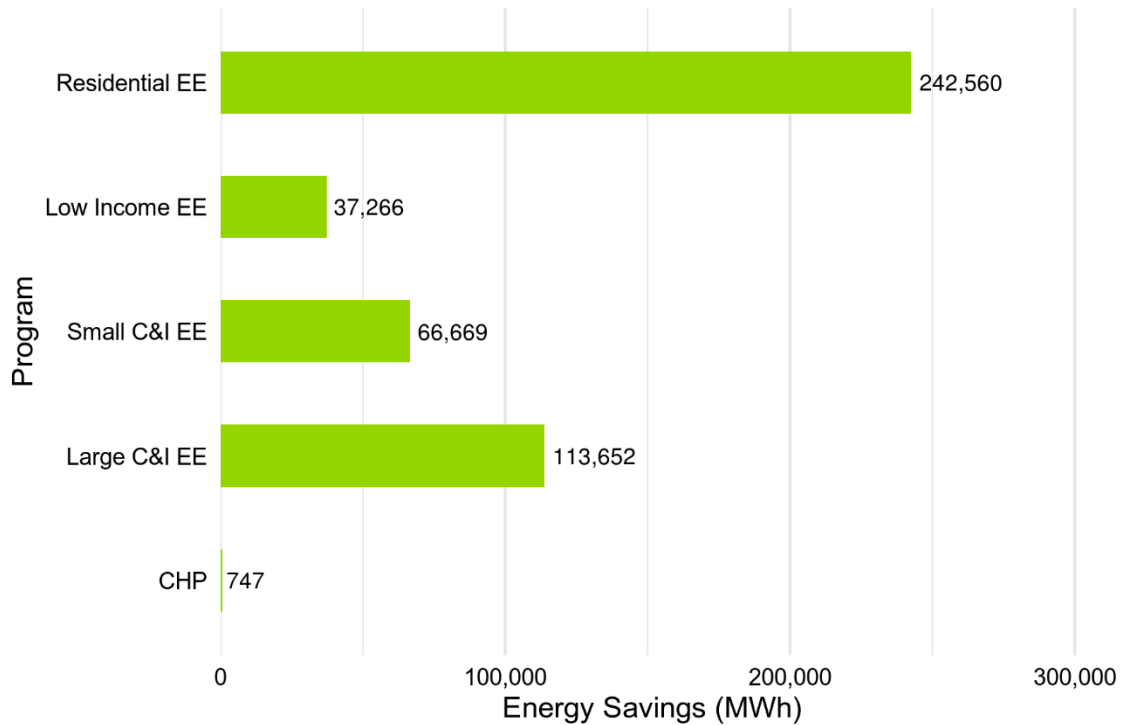
*DR participation is not additive like other programs because the same participants tend to remain in the program with only small attrition. Therefore, total participation in the DR programs for Phase III is equal to the highest program year participation count for each of the three programs.

Sources: PECO's eTrack database, CSP tracking data

5. SUMMARY OF ENERGY IMPACTS BY PROGRAM

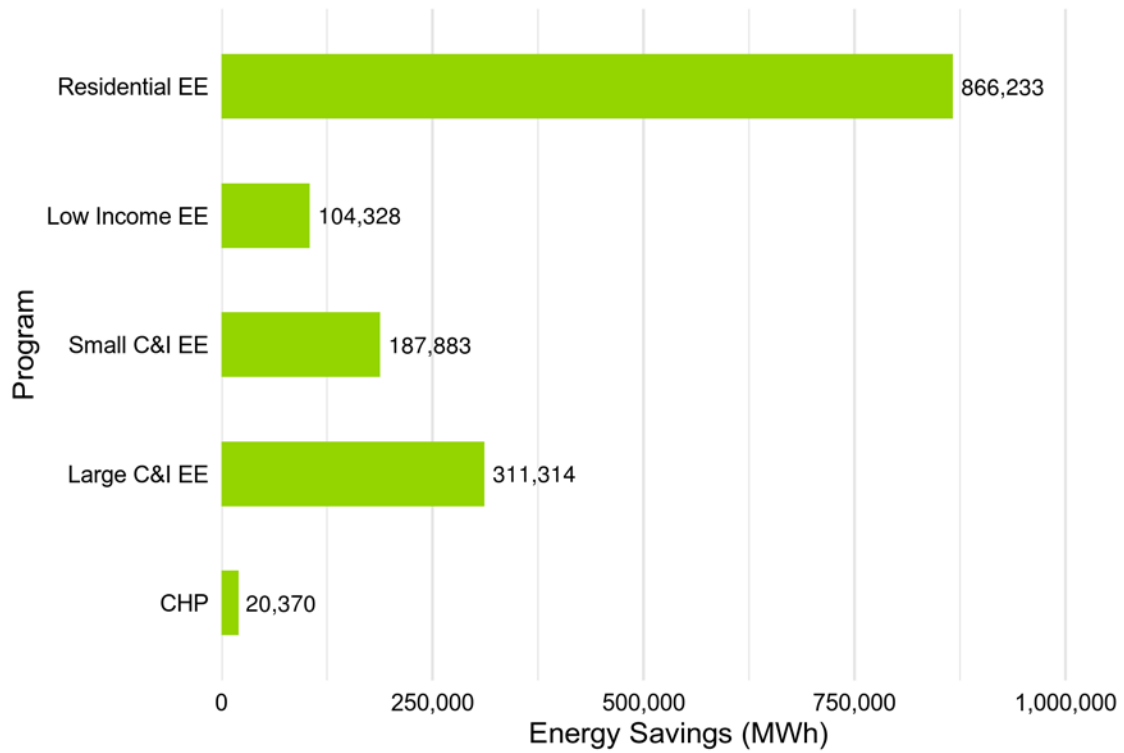
Figure 5-1 presents a summary of the PYTD reported gross energy savings by program for PY11. The energy impacts in this report are presented at the meter level and do not reflect adjustments for T&D losses.

Figure 5-1. PYTD Reported Gross Energy Savings by Program



Sources: PECO's eTrack database, CSP tracking data

Figure 5-2 presents a summary of the PSA gross energy savings by program for Phase III of Act 129. PSA savings include verified gross savings from previous program years and the PYTD savings from the current program year.

Figure 5-2. PSA Energy Savings by Program for Phase III


Sources: PECO's eTrack database, CSP tracking data

Table 5-1 presents a summary of energy impacts by program and solution through the current reporting period.

Table 5-1. Energy Savings by Program and Solution (MWh)

Program and Solution	PYRTD	RTD	VTD	PSA
Lighting, Appliance & HVAC	147,546	482,653	342,062	489,609
Behavioral	66,173*	284,247	210,907	277,080
Appliance Recycling	17,646	59,061	40,651	58,297
Whole Home	6,209	23,562	16,333	22,541
Multifamily Targeted	2,894	12,755	9,649	12,543
Residential New Construction	2,093	6,155	4,070	6,163
Residential EE Program	242,560	868,432	623,673	866,233
Whole Home	37,266	101,487	57,981	95,247
Lighting	0	9,086	9,081	9,081
Low Income EE Program	37,266	110,573	67,062	104,328
Equipment & Systems	49,349	139,129	88,846	138,195
Whole Building	9,249	26,594	17,267	26,516
C&I New Construction	4,514	12,330	8,171	12,685
Multifamily Targeted	3,558	11,590	6,880	10,438
Data Center Targeted	0	119	50	50
Small C&I EE Program	66,669	189,762	121,214	187,883
Equipment & Systems	98,745	275,670	173,813	272,559
C&I New Construction	11,206	26,940	14,945	26,151
Multifamily Targeted	3,701	12,208	8,374	12,075
Data Center Targeted	0	546	529	529
Large C&I EE Program	113,652	315,365	197,662	311,314
Combined Heat & Power Program	747	26,450	19,624	20,370
Portfolio Total	460,894	1,510,582	1,029,234	1,490,128

*The reported savings for the behavioral solution in PY11 represents the savings from June 1, 2019 through April 30, 2020. The reported savings for the behavioral solution will be updated in the PY11 annual report to include the savings from May 1 through May 31, 2020 as well.

Sources: PECO's eTrack database, CSP tracking data

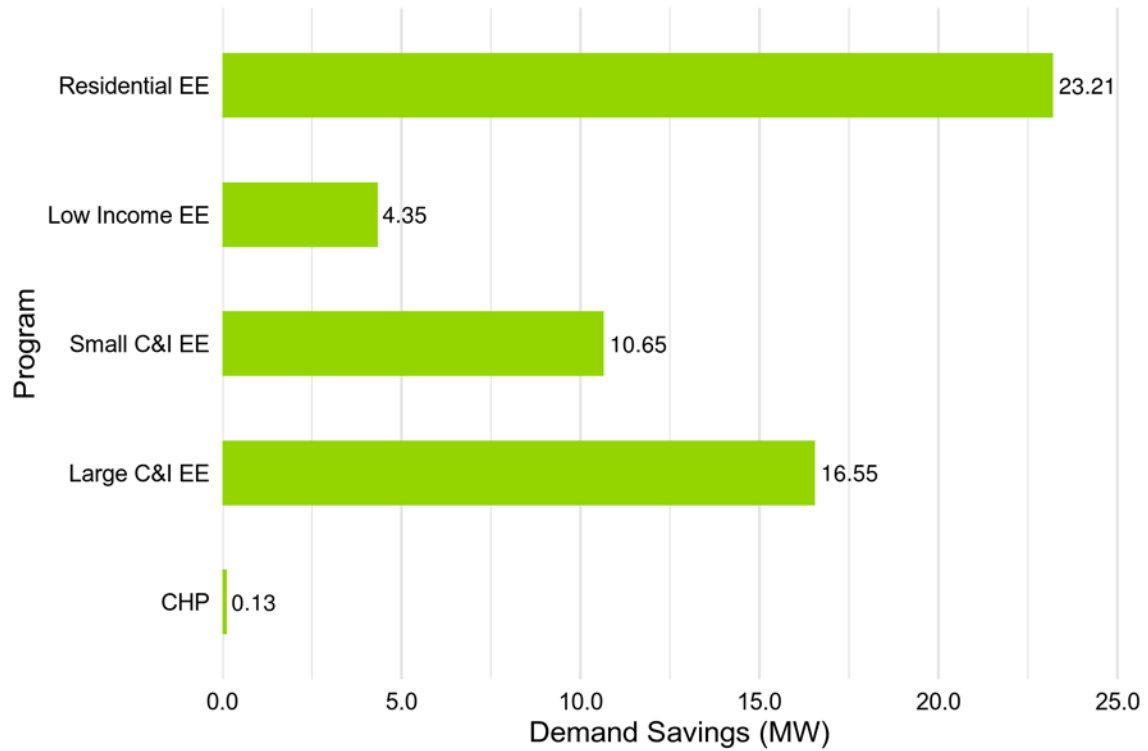
6. SUMMARY OF DEMAND IMPACTS BY PROGRAM

PECO's Phase III EE&C programs achieve peak demand reductions primarily in two 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 Total Resource Cost (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 program year. 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 Sections 6.1 and 6.2.

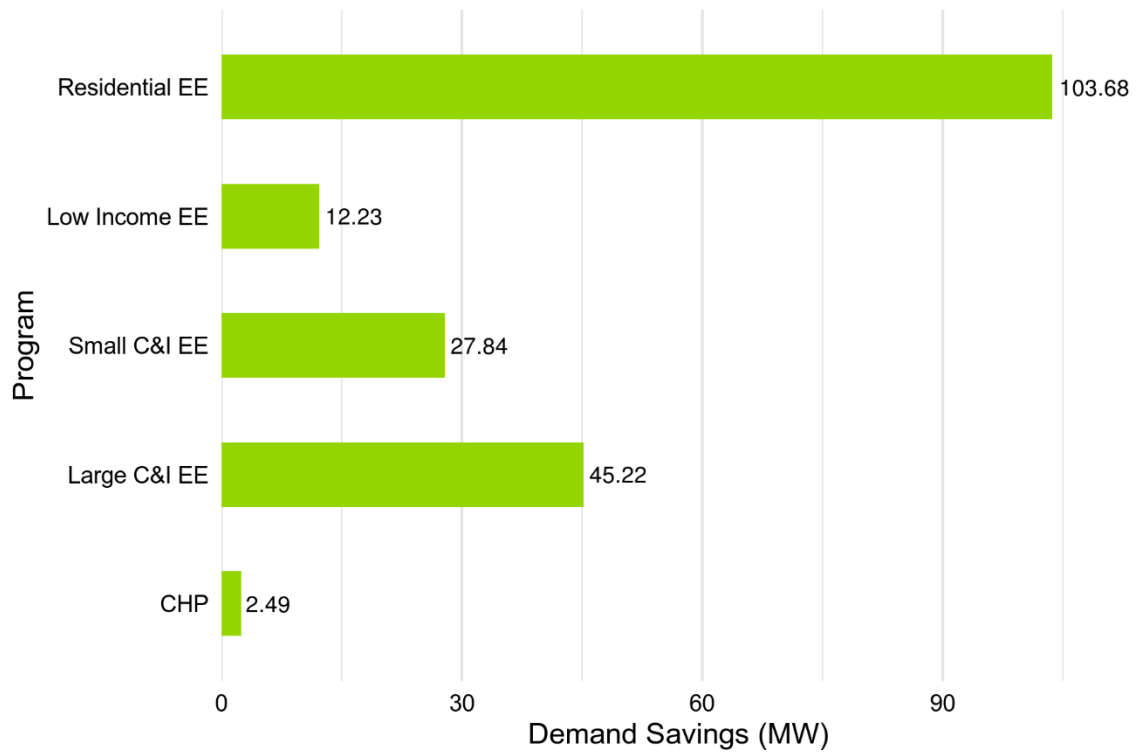
6.1 Energy Efficiency

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 to August. The peak demand impacts from EE in this report are presented at the meter level and do not reflect adjustments for T&D losses. Figure 6-1 presents a summary of the PYRTD reported gross peak demand savings by EE program for PY11.

Figure 6-1. PYRTD Gross Demand Savings by EE Program


Sources: PECO's eTrack database, CSP tracking data

Figure 6-2 presents a summary of the PSA gross demand savings by EE program for Phase III of Act 129.

Figure 6-2. PSA Demand Savings by EE Program for Phase III


Sources: PECO's eTrack database, CSP tracking data

Table 6-1 presents a summary of the peak demand impacts by EE program and solution through the current reporting period.

Table 6-1. Peak Demand Savings by EE Program and Solution (MW)

Program and Solution	PYRTD	RTD	VTD	PSA
Lighting, Appliance & HVAC	18.74	62.69	46.27	65.01
Behavioral	0.00	0.00	24.08	24.08
Appliance Recycling	2.45	8.56	5.89	8.34
Whole Home	0.85	2.85	1.88	2.73
Multifamily Targeted	0.37	1.63	1.18	1.56
Residential New Construction	0.80	2.02	1.17	1.97
Residential EE Program	23.21	77.76	80.47	103.68
Whole Home	4.35	11.93	6.81	11.16
Lighting	0.00	1.07	1.07	1.07
Low Income EE Program	4.35	13.00	7.88	12.23
Equipment & Systems	7.42	19.68	12.65	20.07
Whole Building	1.95	5.47	2.48	4.43
C&I New Construction	0.89	2.24	1.37	2.27
Multifamily Targeted	0.38	1.18	0.68	1.06
Data Center Targeted	0.00	0.02	0.01	0.01
Small C&I EE Program	10.65	28.59	17.19	27.84
Equipment & Systems	14.76	39.60	25.04	39.80
C&I New Construction	1.37	3.34	2.53	3.90
Multifamily Targeted	0.42	1.52	1.07	1.49
Data Center Targeted	0.00	0.04	0.04	0.04
Large C&I EE Program	16.55	44.50	28.67	45.22
Combined Heat & Power Program	0.13	2.80	2.36	2.49
Portfolio Total	54.88	166.65	136.58	191.46

Sources: PECO's eTrack database, CSP tracking data

6.2 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. Act 129 peak demand reduction targets were set for PY9 through PY12; there was no PY8 peak demand reduction target. Phase III DR events are initiated according to the following guidelines¹³:

1. Curtailment events shall be limited to the months of June through September.
2. Curtailment events shall be called for the first 6 days of each program year (starting in PY10) 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.
3. Each curtailment event shall last 4 hours.

¹³ 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.

4. Each curtailment event shall be called such that it will occur during the day's forecast peak hour(s) above 96% of PJM's RTO summer peak demand forecast.
5. Once six curtailment events have been called in a program year, the peak demand reduction program shall be suspended for that program year.

The peak demand impacts from DR in this report are presented at the system level and reflect adjustments to account for T&D losses. The PA 2016 Technical Reference Manual (TRM) specified the T&D line loss adjustment factors that each EDC must use for Act 129 Phase III.¹⁴ PECO uses the following line loss percentages/multipliers by sector.

- Residential = 7.4% or 1.0799
- Small C&I = 7.4% or 1.0799
- Large C&I = 7.4% or 1.0799

Table 6-2 summarizes the demand reductions for each of the DR programs in PECO's EE&C Plan and for the DR portfolio as a whole. Verified gross demand savings are the average performance across all Phase III DR events independent of how many events occurred in a given program year.

Table 6-2. PY11 DR PYVTD Performance by Event

PY	Event Date	Residential DR	Small C&I DR	Large C&I DR	Portfolio	Relative Precision at 90% CI
PY11	July 17, 2019	34.36	0.86	120.04	155.26	6.1%
PY11	July 18, 2019	11.06	1.02	121.63	133.71	5.9%
PY11	July 19, 2019	34.93	1.18	120.89	157.00	5.8%
PY11	August 19, 2019	24.90	0.98	126.17	152.05	5.6%
PYVTD - Average PY11 DR Event Performance		26.31	1.01	122.18	149.50	5.9%

Sources: Guidehouse analysis

¹⁴ 2016 PA TRM. *Pennsylvania Public Utility Commission Technical Reference Manual; State of Pennsylvania Act 129 Energy Efficiency and Conservation Program and Act 213 Alternative Energy Portfolio Standards*. Section 1.14 Transmission and Distribution System Losses. June 2016, Errata Update February 2017.

7. SUMMARY OF FINANCES

Section 7 provides an overview of the expenditures associated with PECO's portfolio and the recovery of those costs from ratepayers.

7.1 Program Financials

Program-specific and portfolio total finances for PY11 are shown in Table 7-1. The columns in Table 7-1 and Table 7-2 are adapted from the Direct Program Cost categories in the Commission's EE&C Plan template¹⁵ for Phase III. EDC Materials, Labor, and Administration includes costs associated with an EDC's own employees. ICSP Materials, Labor, and Administration includes both the program implementation contractor and the costs of any other outside vendors EDCs employ to support program delivery.

Table 7-1. PYTD Financials

Program	Incentives to Participants and Trade Allies (\$1,000)	EDC Materials, Labor, and Administration (\$1,000)	ICSP Materials, Labor, and Administration (\$1,000)	Total Cost (\$1,000)
Residential EE	\$8,795	\$6,808	\$11,431	\$27,035
Low-Income EE	\$170	-\$123	\$8,516	\$8,563
Small C&I EE	\$4,077	\$2,366	\$4,843	\$11,286
Large C&I EE	\$7,066	\$1,474	\$5,044	\$13,583
CHP	\$54	\$0	\$6	\$60
Residential DR	\$2,507	\$1	\$1,308	\$3,815
Small C&I DR	\$99	\$0	\$41	\$139
Large C&I DR	\$0	\$1	\$4,556	\$4,557
Common Portfolio Costs ^a	N/A	N/A	N/A	\$9,545
Portfolio Total	\$22,767	\$10,526	\$35,744	\$78,583
SWE Costs ^b	N/A	N/A	N/A	\$0
Total	\$22,767	\$10,526	\$35,744	\$78,583

^a Includes the administrative CSP, tracking system, general administration, and clerical costs; EDC program management; CSP program management; general management; oversight of major accounts; and technical assistance.

^b Statewide evaluation costs are outside of the 2% spending cap.

Sources: PECO's eTrack database, CSP tracking data

¹⁵ <http://www.puc.pa.gov/pcdocs/1372426.doc> Section 10

Table 7-2 shows program-specific and portfolio total finances since the inception of Phase III.

Table 7-2. Phase III to Date Financials

Program	Incentives to Participants and Trade Allies (\$1,000)	EDC Materials, Labor, and Administration (\$1,000)	ICSP Materials, Labor, and Administration (\$1,000)	Total Cost (\$1,000)
Residential EE	\$30,094	\$23,871	\$44,832	\$98,797
Low-Income EE	\$1,204	\$1,087	\$30,403	\$32,694
Small C&I EE	\$9,970	\$8,935	\$15,517	\$34,421
Large C&I EE	\$16,978	\$3,683	\$18,461	\$39,122
CHP	\$1,143	\$0	\$93	\$1,236
Residential DR	\$11,020	\$33	\$4,646	\$15,699
Small C&I DR	\$442	\$2	\$132	\$577
Large C&I DR	\$0	\$66	\$13,231	\$13,297
Common Portfolio Costs ^a	N/A	N/A	N/A	\$38,353
Portfolio Total	\$70,852	\$37,677	\$127,314	\$274,196
SWE Costs ^b	N/A	N/A	N/A	\$700
Total	\$70,852	\$37,677	\$127,314	\$274,896

^a Includes the administrative CSP, tracking system, general administration, and clerical costs; EDC program management; CSP program management; general management; oversight of major accounts; and technical assistance.

^b Statewide evaluation costs are outside of the 2% spending cap.

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 four customer sectors to ensure that 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 7-3 and Section 2. For example, the low-income customer segment is a subset of PECO's residential tariff(s) and may also include low-income customers in master-metered, multifamily facilities and is, therefore, not listed in Table 7-3.

Table 7-3. EE&C Plan Expenditures by Cost Recovery Category¹⁶

Cost Recovery Sector	Rate Classes Included	PYTD Spending (\$1,000)	P3TD Spending (\$1,000)
Residential	R, RH, and CAP	\$40,865	\$161,207
Small C&I	GS	\$14,209	\$44,373
Large C&I	PD, HT, and EP	\$23,481	\$68,500
Municipal	SLE, AL, and TLCL	\$28	\$117
Portfolio Total		\$78,583	\$274,196

Source: PECO

¹⁶ Excludes SWE costs.

APPENDIX A. PARTICIPATION COUNT

Across PECO's portfolio, there are significant differences in how participation is calculated across solutions and CSPs. Table A-1 provides an overview of the different participation definitions by program and solution.

Table A-1. Overview of Participation Definitions

Program	Solution	Conservation Service Provider	Participation Definition
Residential	LAH (Lighting)	CLEAResult	Sum number of total lamp packs sold
	LAH (Appliance and HVAC)	CLEAResult	Count of rebates issued
	Whole Home	CLEAResult	Count of unique premise ID
	Appliance Recycling	ARCA	Count of all orders on distinct days
	New Construction	PSD	Sum No. of Participants
	Behavioral	Oracle	Sum No. of Participants
	Multifamily	Franklin	Distinct Count of Utility Account ID by Program, Solution and Invoice Number
Low Income	Whole Home	CMC	Count of unique Premise Numbers for Component 1 and 2
	Whole Home	ARCA	Count of all orders on distinct days
Small C&I	Equipment and Systems	ICF	Count of unique Project Number
	New Construction	ICF	Count of unique Project Number
	Whole Building	SmartWatt	Count of unadjusted projects
	Multifamily	Franklin	Distinct Count of Utility Account ID by Program, Solution and Invoice Number
Large C&I	Equipment and Systems	ICF	Count of unique Project Number
	New Construction	ICF	Count of unique Project Number
	Data Centers	ICF	Count of unique Project Number
	Multifamily	Franklin	Distinct Count of Utility Account ID by Program, Solution, Sector and Invoice Number

Program	Solution	Conservation Service Provider	Participation Definition
Combined Heat & Power Program		Varies by participant	Count of unique Project Number
Residential DR		Itron	Count of unique Account Number with device status as installed or swapped and the measure code is CACS (central air conditioner switch)
Small C&I DR		Itron	Count of unique Account Number with device status as installed or swapped and the measure code is CACS (central air conditioner switch)
Large C&I DR		CPower and EnelX	Large C&I customer (defined by Account Number) enrolled for at least 1 hour of at least one event