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E-FILE

March 15, 2021

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

Re: Semi-Annual Report for the Period June 1, 2020 through May 31, 2021 and Demand Response Annual Report for the Period June 1, 2020 through November 15, 2020, Program Year Twelve (12) of PPL Electric Utilities Corporation's Act 129 Plan
Docket No. M-2015-2515642

Dear Ms. Chiavetta:

Enclosed on behalf of PPL Electric Utilities Corporation ("PPL Electric") are the Semi-Annual Report and the Demand Response Annual Report for Program Year Twelve (12) of PPL Electric's Act 129 Plan.

Pursuant to 52 Pa. Code § 1.11, the enclosed documents are to be deemed filed on March 15, 2021, which is the date it was filed electronically using the Commission's E-filing system.

If you have any questions or need additional information, please contact me or Dirk Chiles, Manager-Energy Efficiency, at (484) 634-3005.

Respectfully submitted,

Michael J. Shafer

Enclosures

cc via email: Greg Clendenning (GDS Associates, Inc. Act 129 Statewide Evaluator)
Salil Gogte – Ecometric Consulting
Jesse Smith – Demand Side Analytics

Semi-Annual Report to the Pennsylvania Public Utility Commission

Phase III of Act 129

Program Year 12

(June 1, 2020 – May 31, 2021)

For Pennsylvania Act 129 of 2008

Energy Efficiency and Conservation Plan

Prepared by Cadmus

For

PPL Electric Utilities

March 15, 2021

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Acronyms

BDR	Behavioral Demand Response
C&I	Commercial and Industrial
CFL	Compact Fluorescent Lamp
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
GNE	Government, Nonprofit, Education
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
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 savings 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
PYVTD	Program Year Verified to Date
RTD	Phase III to Date Reported Gross Savings
SWE	Statewide Evaluator
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 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 EDC or its program Implementation Conservation Service Providers (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 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 MWh/year or MW/year. The Pennsylvania 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. The 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 semi-annual 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).

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.

Table 1 lists savings values for a hypothetical EDC as of the PY10 semi-annual report, when the first six months of PY10 reported savings are available. The calculations below are then used to illustrate the differences between various savings values.

Table 1: P3TD Savings Calculation Example

Program Period	Reported Gross (MWh/year)	Verified Gross (MWh/year)
Phase II (Carryover)	N/A	400
PY8	800	700
PY9	900	850
PY10 (Q1+Q2)	500	N/A

PYRTD (PY10) = 500 MWh/year

RTD = 800 + 900 + 500 = 2,200 MWh/year

VTD = 700 + 850 = 1,550 MWh / year

PSA = 1,550 + 500 = 2,050 MWh/year

PSA + CO = 2,050 + 400 = 2,450 MWh/year

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 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 PPL Electric Utilities in Program Year 12 (PY12), 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 towards EDC savings compliance targets for Phase III.

This report details the participation, spending, and reported gross impacts of the energy efficiency programs in PY12 quarters 1 and 2. Compliance with Act 129 savings goals are ultimately based on verified gross savings. PPL Electric Utilities has retained Cadmus as an independent evaluation contractor for Phase III of Act 129. Cadmus is responsible for the measurement and verification of the savings and calculation of verified gross savings. The verified gross savings for PY12 energy efficiency programs will be reported in the final annual report, to be filed on November 15, 2021.

Phase III of Act 129 includes a demand response goal for PPL Electric Utilities. Demand response events are limited to the months of June through September, which are the first four months of the Act 129 program year. Because the demand response season is completed early in the program year, it is possible to complete the independent evaluation of verified gross savings for demand response sooner than is possible for energy efficiency programs. *Section 6.2* of this report includes the verified gross demand response impacts for PY12 as well as the cumulative demand response performance of this 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

PPL Electric Utilities does not have carryover savings from Phase II. Figure 1 compares PPL Electric Utilities' Phase II verified gross savings total to the Phase II compliance target to illustrate the carryover calculation.

The Commission's Phase III Implementation Order[1] also allowed EDCs to carry over savings in excess of the overall (portfolio) Phase II savings compliance target, in excess of the Phase II GNE savings compliance target and in excess of the Phase II low-income savings compliance target.[2] PPL Electric Utilities did not have carry over savings for the portfolio but did exceed its Phase II compliance targets for GNE and low-income. However, in the August 3, 2017, Compliance Order,[3] the PA PUC determined that because PPL Electric Utilities did not obtain Phase II savings in excess of its Phase II consumption reduction requirement, PPL Electric Utilities was not entitled to any GNE or low-income sector carryover savings into Phase III.

2.2 Phase III Energy Efficiency Achievements to Date

Since the beginning of Program Year 12 on June 1, 2020, PPL Electric Utilities has claimed:

- 69,220 MWh/yr of reported gross electric energy savings (PYRTD)
- 10.53 MW/yr of reported gross peak demand savings (PYRTD) from energy efficiency programs
- 98.72 MW/yr of reported gross peak demand savings (PYRTD) from demand response programs

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

- 1,650,846 MWh/yr of reported gross electric energy savings (RTD)
- 279.37 MW/yr of reported gross peak demand savings (RTD) from energy efficiency programs
- 1,568,191 MWh/yr of gross electric energy savings (PSA), which includes verified gross savings from previous Phase III program years[4] and the PYTD reported gross savings from PY12
- 4,084 MWh/yr from PY11 remain unverified
- 219.92 MW/yr of gross peak demand savings (PSA) from energy efficiency programs
- 1.38 MW/yr of peak demand savings from energy efficiency programs in PY11 remain unverified
- 106.70 MW/yr of reported gross peak demand savings (RTD) from demand response, reported as the average demand savings across all PY9, PY10, PY11, and PY12 Act 129 demand response events

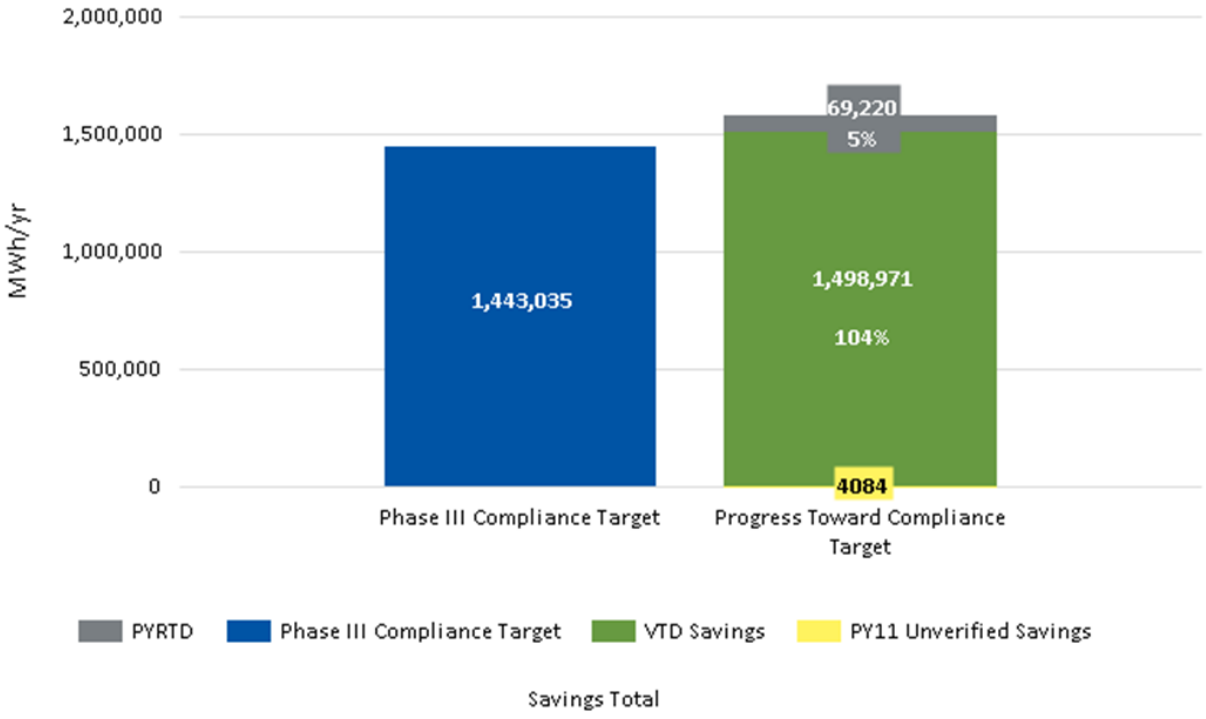
[1] Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program* Implementation Order, at Docket No. M-2014-2424864, (*Phase III Implementation Order*), entered June 11, 2015.
[2] Proportionate to those savings achieved by dedicated low-income programs in Phase III.
[3] The Order addresses the EDCs' compliance with the Phase II energy reduction targets and the Petitions for reconsideration of the April 6, 2017, Compliance Order filed by Duquesne, PECO, and PPL Electric Utilities. Pennsylvania Public Utility Commission. Act 129 Phase II Final Compliance Order. Docket No. M-2012-2289411. Adopted August 3, 2017. Available online: http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/energy_efficiency_and_conservation_ee_c_program.aspx
[4] Verified savings from previous program years have been adjusted to account for Home Energy Education Program energy savings uplift (see Appendix C in the PY11 Annual Report). Uplift results in savings counted in more than one program; therefore, an adjustment is made to prevent double counting.

- 108.37 MW/yr of verified gross peak demand savings (PSA) from demand response programs, calculated as the average demand savings across all PY9, PY10, PY11, and PY12 Act 129 demand response events

PPL Electric Utilities has achieved:

- 1,568,191 MWh/yr of PSA+CO energy savings recorded to date in Phase III[5]
    - This represents 109% of the May 31, 2021, energy savings compliance target of 1,443,035 MWh/yr.

Figure 1: EE&C Plan Performance Toward Phase III Portfolio Compliance Target [(1)]



[(1)]The total may not sum to 100% due to rounding.

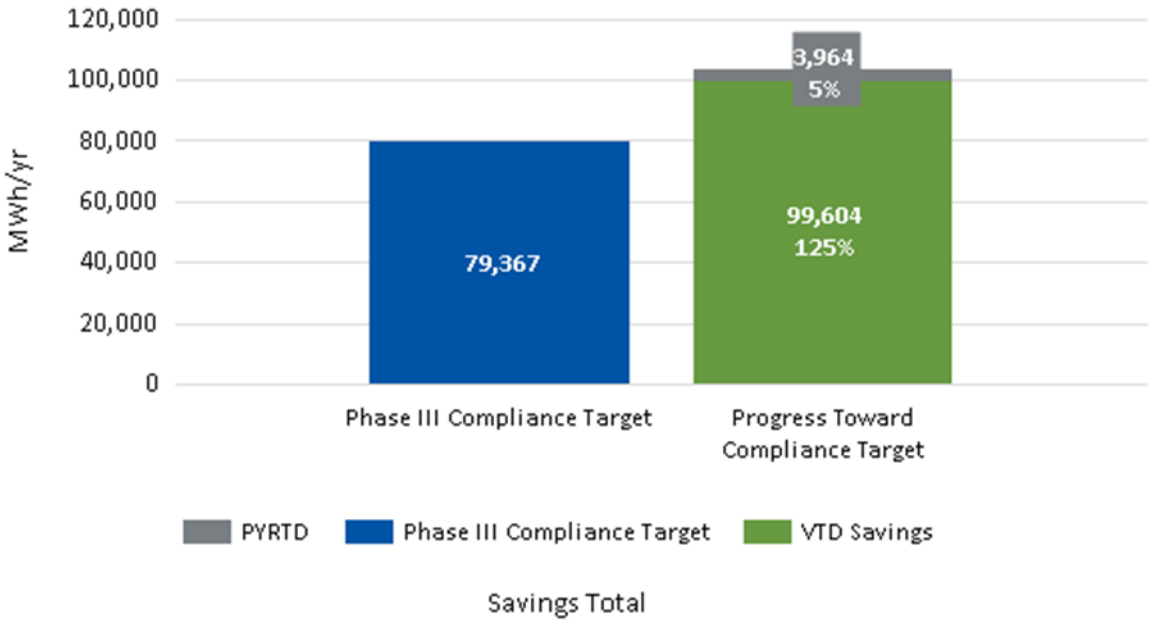
The Phase III Implementation Order directed EDCs to offer conservation measures to the low-income customer segment based on the proportion of electric sales attributable to low-income households. The proportionate number of measures target for PPL Electric Utilities is 9.95%. PPL Electric Utilities offers a total of 100 EE&C measures to its residential and nonresidential customer classes. In PY12 Q1 and Q2, there are 22 measures available to the low-income customer segment at no cost to the customer. This represents 22% 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 low-income savings target for PPL Electric Utilities is 79,367 MWh/yr verified gross energy savings. Figure 2 compares

[5] Verified savings from previous program years have been adjusted to account for Home Energy Education Program energy savings uplift (see Appendix C in the PY11 Annual Report). Uplift results in savings counted in more than one program; therefore, an adjustment is made to prevent double counting.

the PSA+CO performance to date for the low-income customer segment to the Phase III savings target. Based on the latest available information, PPL Electric Utilities has achieved 130% of the Phase III low-income energy savings target.

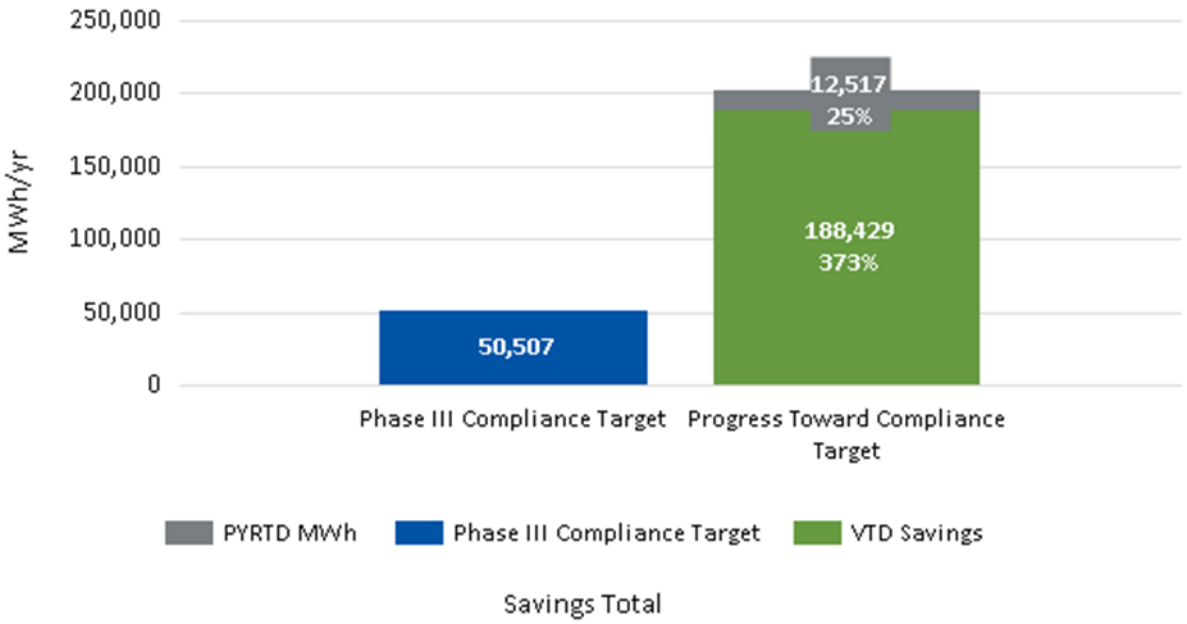
Figure 2: EE&C Plan Performance Toward Phase III Low-Income Compliance Target [(1)]



[(1)]WRAP includes savings for master-metered multifamily projects that are allocated to the GNE and Small C&I sectors based on the rate class of the buildings' meters (included in this figure). All savings from the WRAP program are counted toward the low-income compliance target, as set forth in PPL Electric Utilities EE&C Plan Act 129 Phase III, Docket No. M-2015-2515642, November 2018. Therefore, the total savings shown here do not match the totals in Table 4: Phase III Summary Statistics by Customer Segment. The additional savings counted toward the low-income compliance target total 2,909 MWh/yr of verified savings: 2,426 MWh/yr from GNE and 483 MWh/yr from Small C&I, and 0 MWh/yr of reported savings from PY12.

The Phase III Implementation Order established a government, nonprofit, and educational energy savings target of 3.5% of the portfolio savings goal. The GNE savings target for PPL Electric Utilities is 50,507 MWh/yr verified gross energy savings. Figure 3 compares the PSA+CO performance to date for the GNE customer segment to the Phase III savings target. Based on the latest available information, PPL Electric Utilities has achieved 398% of the Phase III GNE energy savings target.

Figure 3: EE&C Plan Performance Toward Phase III GNE Compliance Target [(1)]



[(1)]WRAP includes savings for master-metered multifamily projects that are allocated to the GNE and Small C&I sectors based on the rate class of the buildings' meters (included in this figure). All savings from the WRAP program are counted toward the low-income compliance target, as set forth in PPL Electric Utilities EE&C Plan Act 129 Phase III, Docket No. M-2015-2515642, November 2018. Therefore, the savings in this figure do not include the 2,426 verified MWh/yr and 0 reported MWh/yr GNE savings allocated to Low Income WRAP and do not match the GNE savings in Table 4: Phase III Summary Statistics by Customer Segment.

2.3 Phase III Demand Response Achievements to Date

The Phase III demand response performance target for PPL Electric Utilities is 92 MW. Compliance targets for demand response programs are based on average performance across event hours and were established at the system level, which means the load reductions measured at the customer meter must be escalated to reflect transmission and distribution losses. Compliance with Act 129 will not be based on performance in PY12 per the Pennsylvania Public Utility Commission's Phase III Modification Order that the Pennsylvania electric distribution companies may operate the demand response programs in PY12 on a voluntary basis.[6] The Commission modified the compliance requirements in response to disruptions to electric utility customer operations related to the COVID-19 pandemic. However, the Commission encouraged the utilities to operate their programs in PY12, and PPL Electric Utilities elected to continue operating the program for commercial and industrial (C&I) customers and for government, nonprofit, and education (GNE) customers.

Act 129 demand response 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 demand response event is initiated for the following day. In

[6] Pennsylvania Public Utility Commission. June 3, 2020. *Phase III Modification Oder.* Docket No. M-2014-2424864. http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/energy_efficiency_and_conservation_ee_c_program.aspx

PY12, there were five voluntary demand response events called. Table 2 lists the days that DR events were called along with the verified gross demand reductions achieved by each program. Table 2 also lists the average DR performance for PY12, the PY9-PY11 compliance period, and for Phase III to date.

Table 2: PY12 Demand Response PYVTD Performance by Event

Event Date	Start Hour	End Hour	Small CI Load Curtailment (MW)	Large CI Load Curtailment (MW)	GNE Load Curtailment (MW)	Portfolio MW/event Impact [1]
July 20, 2020	2 p.m.	6 p.m.	2.1	103.1	4.5	109.6
July 27, 2020	2 p.m.	6 p.m.	1.6	97.5	3.2	102.4
July 29, 2020	3 p.m.	7 p.m.	2.0	71.2	3.3	76.5
August 25, 2020	2 p.m.	6 p.m.	2.9	87.6	0.9	91.3
August 27, 2020	3 p.m.	7 p.m.	1.9	101.5	1.3	104.7
PYVTD - Average PY12 DR Event Performance						**96.9**
PY9-PY11 Compliance Period Average DR Event Performance						**112.8**
VTD - Average Phase III DR Event Performance						**108.4**

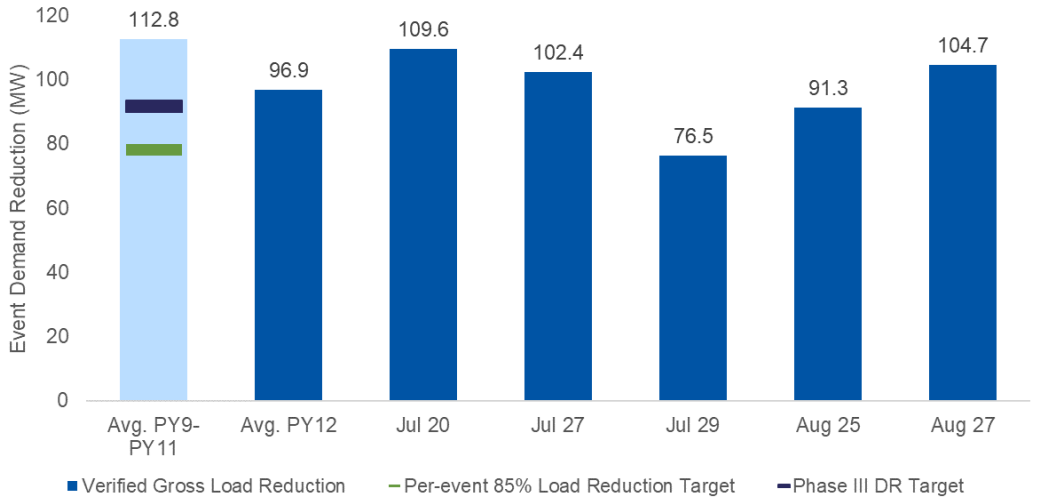
[1] Portfolio MW/event may not equal the sum of customer segment MW/event because of rounding.

Figure 4 shows the PY9-PY11 gross verified savings, which were the basis for determining Phase III compliance. For Phase III, the verified Act 129 event load reductions were 112.8 MW (the average load reduction over PY9, PY10, and PY11 event hours), which exceeds the Phase III compliance target of 92 MW. In addition, in PY9, PY10, and PY11, PPL Electric Utilities met its per-event compliance target of at least 78.2 MW (85% of the total compliance target) in each demand response event.

Figure 4 also shows the gross verified savings for PY12 by event. In PY12, verified Act 129 event load reductions were 96.9 MW (equal to the average demand reduction over the five 4-hour demand response events), a realization rate of 98.2% relative to the reported (*ex ante*) load reduction.

These verified load impacts are based on Cadmus analysis of participant AMI consumption data and have been grossed up to reflect transmission and distribution losses.

Figure 4: Event Performance Compared to 85% Per-Event Target



2.4 PHASE III PERFORMANCE BY CUSTOMER SEGMENT

Table 3 presents the participation, savings, and spending by customer sector for PY12. 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 (LI) segment is a subset of the residential customer class. The GNE segment includes customers who are part of the small C&I or large C&I rate classes. The savings, spending, and participation values for the LI and GNE segments have been removed from the parent sectors in Table 3.

Table 3: PY12 Summary Statistics by Customer Segment

Parameter	Residential	Low-Income	Small C&I	Large C&I	GNE	Total [1]
Number of Participants [2]	10,593	2,408	1,703	526	895	16,125
PYRTD MWh/yr	10,976	3,964	27,160	14,603	12,517	69,220
PYRTD MW/yr (Energy Efficiency)	2.25	0.38	4.04	2.11	1.76	10.53
PYVTD MW/yr (Demand Response) [3]	-	-	2.10	92.18	2.63	96.91
Incentives ($1000)	$1,482	$0	$2,413	$2,095	$1,010	$7,001

[1] Total may not sum due to rounding.
[2] Please see Table 5 for participant definitions. Some participant definitions, e.g., WRAP, have been retroactively changed.
[3] Savings are presented as the average of the total demand response savings per event across the July 20, July 27, July 29, August 25, and August 27 Act 129 events.

Table 4 summarizes plan performance by sector since the beginning of Phase III.

Table 4: Phase III Summary Statistics by Customer Segment

Parameter	Residential (1)	Low Income	Small C&I (1)	Large C&I	GNE	Total (2)
Number of Participants (3)	1,374,495	132,204	64,303	3,617	8,346	1,582,965
PSA MWh/yr (4)	635,220	100,658	391,501	263,488	203,372	1,594,239
PSA MW/yr (4) (Energy Efficiency)	89.43	10.43	60.87	33.57	29.45	223.75
Phase III MW/yr (Demand Response) (5)	-	-	1.70	102.41	4.26	108.37
Incentives ($1000)	$34,386	$0	$27,604	$19,732	$10,053	$91,775

(1) 80,945 of PSA MWh/yr and 16.97 PSA MW from Efficient Lighting are attributed to Small C&I.
(2) Total may not sum due to rounding.
(3) Please see Table 5 for participant definitions. Some participant definitions, e.g., WRAP, have been retroactively changed.
(4) These totals also include unverified savings from PY11 for the New Homes component of the Energy Efficient Home Program. The residential verified savings included in PSA MWh/yr and MW/yr have not been adjusted to account for energy savings uplift (double counting) in the Home Energy Education Program. As shown in Table 6 and Table 7, the double-counting adjustments applied to cumulative verified savings are -21,964 MWh and -2.45 MW.

Parameter	Residential [1]	Low Income	Small C&I [1]	Large C&I	GNE	Total [2]
[5] Savings are presented as the average of the total demand response savings per event across the June 13, 2017, July 20, 2017, July 21, 2017, July 2, 2018, July 3, 2018, August 6, 2018, August 28, 2018, September 4, 2018, September 5, 2018 and July 17, 2019, July 18, 2019, July 19, 2019 and August 19, 2019, and July 20, 2020, July 27, 2020, July 29, 2020, August 25, 2020, and August 27, 2020 Act 129 events.						

3 Updates and Findings

3.1 Implementation Updates and Findings

This section contains implementation updates.

- **Appliance Recycling (residential sector).** COVID-19 has had a great impact on the Appliance Recycling program. The program was suspended in mid-March 2020 but customers could add their name to a waitlist until the program resumed. The waitlist remained in effect until mid-July at which time contactless pick-ups began for those customers. In November, the program re-opened to all customers with contactless pick-ups. There were 1,655 participants in PY12-to-date and 53,202 phase-to-date who recycled refrigerators, freezers, room air conditioners, and dehumidifiers.
- **Demand Response.** PPL Electric Utilities' ICSP, CPower, enrolled 126 customers' facilities in the program either itself or through sub-contractors during PY12 (June 1, 2020, to May 31, 2021) and 118 participated in at least one event. PPL Electric Utilities initiated five events during the summer of PY12 because the PJM threshold trigger was met. The average reported performance of the events was 96.9 MWs, exceeding the program performance requirement of 92 MW per event average. The Pennsylvania Public Utility Commission made PY12 participation voluntary due to possible customer hardship related to COVID-19.
- **Efficient Lighting (residential sector).** This program was not implemented in PY12. Given the uncertainty of the current lighting legislation, the Efficient Lighting Program was designed to emphasize the lighting incentives in the early part of Phase III, with a phase out target toward the end of 2019. By the end of November 2019, the lighting incentives were discontinued by major retailers. Although the lighting incentive was phased out, PPL Electric Utilities continues to maintain the lighting page on its website and continues to encourage customers to purchase LEDs. Specialty LEDs are available on the online marketplace.
- **Energy Efficiency Kits and Education (residential low-income sector).** This program was not implemented in PY12. The Energy Efficiency Kits and Education program launched June 1, 2016, and targeted income eligible customers. The program delivered more than 50,000 energy efficiency kits through direct mail or one of the 20 participating agencies. The ICSP stopped distributing energy efficiency kits to agencies and through direct mail in 2019. The program enjoyed very high customer satisfaction levels.
- **Energy Efficient Home (residential sector).** Phase-to-date, over 54,000 customers have completed the online assessment and over 40,000 received an energy efficiency kit for their home. Ductless heat pumps remain the most popular HVAC measure with over 1,200 projects in PY12-to-date. Smart thermostat rebates were steady through PY12 with 258 downstream rebates and 176 through the online marketplace. PPL Electric Utilities continues to experience strong performance in efficient new home construction with 577 homes-to-date in PY12.
- **Home Energy Education (residential sector).** This program sends home energy reports to customers; it is not a rebate program. This program had shown decreasing customer satisfaction, which was due in part to customer fatigue in receiving the reports over several years. The home energy reports were discontinued beginning January 1, 2020 although the low-income customers will continue to receive the home energy reports through the end of Phase III.

- **Non-Residential: Custom (nonresidential sector).** Due to COVID-19, all site visits were conducted virtually. For projects that required logging, data loggers were sent to the premise for installation. The Custom program continues to be a popular program with 34% of the Non-Residential savings in PY11 attributed to custom projects. While a large portion of the custom savings are attributed to CHP projects, PPL Electric Utilities has a mix of HVAC, advanced lighting controls, process improvement, and motor projects that contribute to the custom savings.
- **Non-Residential: Efficient Equipment (nonresidential sector).** PPL Electric Utilities continues to receive applications for prescriptive equipment projects. In PY11 less than 1% of the overall savings for the Non-Residential Program was attributed to prescriptive equipment projects. Effective January 1, 2020 all efficient equipment projects require pre-approval.
- **Non-Residential: Efficient Equipment Lighting (nonresidential sector).** Due to COVID-19, all site visits were conducted virtually. For projects that required logging, data loggers were sent to the premise for installation. About 54% of nonresidential PY11 savings are attributed to Efficient Equipment lighting measures. Direct Discount (DD) channel contributes about 18% of the nonresidential portfolio PY11 savings. Effective January 1, 2020, all efficient equipment lighting projects require pre-approval.
- **Non-Residential: Midstream Lighting (nonresidential sector).** Distributors were impacted by COVID-19 from closures and shutdowns in early 2020. Entering the 5th year of Midstream PPL Electric Utilities has 21 distributors with 80+ locations and continues to ensure distributors are active participants. In PY11, 12% of total savings were attributed to the Midstream Lighting Program.
- **Student Energy Efficient Education (residential sector)**. Due to COVID-19, the Student Energy Efficient Education Program for PY12 will be delivered to students virtually. The Bright Kids and Innovation cohorts are fully subscribed for PY12 and the Take Action program is continuing to recruit students for the spring. The program will reach over 24,000 children at approximately 200 schools, including over 23,000 kits distributed to participating children. With the PA PUC approval of changes to PPL Electric Utilities' EE&C Plan, a portion of the program's energy savings, budget, and participants from this residential program will be allocated to the low-income sector. In PY12, this program will again focus on schools in low-income areas of PPL Electric Utilities' service territory with a minimum of 45% reduced and free lunches, as documented by the Pennsylvania Department of Education. Savings for the low-income component will be reported under WRAP.
- **WRAP (residential low-income sector).** This program for income eligible customers launched June 1, 2016 with a seamless transition for customers from Phase II to Phase III. Customer interest and satisfaction remains high. The program has completed nearly 45,000 jobs, including participants in the Manufactured Home Initiative. The program was paused in March 2020 due to safety concerns around COVID-19. A virtual WRAP component was launched in June 2020, with about 2,400 assessments completed as of November 30th, 2020.

3.2 Evaluation Updates and Findings

This section summarizes evaluation activities occurring within each program during PY12. For each program offered in PY12, Cadmus updated the evaluation plans, and submitted them to PPL Electric Utilities and the SWE. Cadmus received Q1 and Q2 participation data and confirmed that it contained the necessary data for evaluation activities. Cadmus launched surveys with Q1 and Q2 participants in January 2021 for the Appliance Recycling, Energy Efficient Home, Custom, Efficient Equipment and WRAP programs.

- **Appliance Recycling (residential sector).** Cadmus finalized and updated the PY12 interview guide and will schedule an interview with the program implementer in the coming months. Cadmus reviewed tracking data for Q1-Q2 and completed the mid-year realization rate memo.
- **Demand Response (nonresidential sector).** Cadmus estimated the load impacts for each of the PY12 participant facilities during the hours of the five events. Cadmus administered an online and telephone survey with enrolled customers and drafted the findings of the load impact analysis, staff interviews, and customer surveys for the PY12 annual report which will be submitted by March 15, 2021.
- **Energy Efficient Home (residential sector).** Cadmus started mid-year analysis of realization rates using data through Q2.

Non-Residential: Custom (nonresidential sector). Cadmus verified savings for five PY12 projects in the large stratum in Q1 and Q2. Ongoing evaluation activities, including review of project documentation, creation of site-specific measurement and verification plans, deployment of evaluator installed metering equipment, determination of project savings using a high-rigor approach, and presenting finalized savings in a verification report, are currently underway for five projects in the small stratum sample and approximately 17 large stratum project.

Non-Residential: Efficient Equipment (nonresidential sector). Cadmus began a review of project documentation and submitted a list of projects in the evaluation sample to the SWE. Verification site visits will begin later in February.

Non-Residential Efficient Equipment Lighting (nonresidential sector). Cadmus prepared the PY12 Q1 and Q2 survey samples for prescriptive lighting and Direct Discount lighting projects and launched the PY12 Q1Q2 participant survey on January 28th. Cadmus submitted a list of projects in the evaluation sample to the SWE for Q1 and Q2.

Non-Residential: Midstream Lighting (nonresidential sector). Cadmus selected an evaluation sample from PY12 Q1 and Q2 records, requested and received supporting data from the ICSP, and began conducting desk reviews. Cadmus submitted a list of projects in the evaluation sample to the SWE.

- **Student Energy Efficient Education (residential sector)**. Cadmus updated the stakeholder interview guide and conducted the stakeholder interview.
- **WRAP (residential low-income sector).** Cadmus began reviewing survey data to determine in-service rates and other impact analysis inputs.

4 Summary of Participation by Program

Participation is defined differently for each program depending on the program delivery channel and data tracking practices. The nuances of the participant definition vary by program and are summarized by program in Table 5. The table provides the current participation totals for PY12 and Phase III.

Table 5: EE&C Plan Participation by Program

Program	Participant Definition	PY12TD Participation	P3TD Participation
Appliance Recycling	Unique job number; corresponds with each unique appliance decommissioned through the program during the program year.	1,655	53,202
Demand Response	Unique account number; corresponds to a customer that enrolled in the Program; not the number who participated in at least one event.	126	353
Efficient Lighting	Person or business purchasing discounted bulbs. See the Efficient Lighting Chapter, in the PY11 Annual report [(1)] describing the approach to computing number of participants. This program is not being implemented in PY12.	-	1,003,843
Energy-Efficiency Kits and Education	Unique job number; corresponds to an energy-savings kit delivered to an income-eligible customer through the agency or the direct-mail delivery channel Participation is determined by the unique job numbers. Returned kits are assigned two unique job numbers: one for the distributed kit, and one for the returned kit. This program is not being implemented in PY12.	-	55,137
Energy Efficient Home	Unique job number; corresponds to a rebated project Households could have more than one rebated project.	8,954	93,189
Home Energy Education [(2)]	Unique bill account number (household) that receives a home energy report in any program year (a household is counted once, even if it received reports in more than one year).	-	208,079
Non-Residential Energy Efficiency	*Custom:* Unique job number; commercially operable job that received an incentive payment during the reporting period. *Midstream Lighting Program:* Unique job number (RBT); corresponds to each purchase of discounted products. *Prescriptive Lighting and Equipment*: Unique job number; corresponds to each unique job that received a rebate.	2,982	28,526
Student Energy Efficient Education [(2)]	Number of participants is counted as the number of energy conservation kits delivered.	-	96,381

Program	Participant Definition	PY12TD Participation	P3TD Participation
Winter Relief Assistance Program (WRAP)	Unique bill account number; corresponds to an income-eligible household that receives an audit and program services. In PY8, a participant was defined as a unique job, but the PY9 updated definition is applied retroactively here. Therefore, the P3TD total will not match the PY8 total plus PY9TD + PY10TD + PY11TD + PY12TD. In PY10 and PY11, an LED giveaway component was added to the program. The participant count for this component is equal to the number of packs given away, 2,450 in PY10 and 2,200 in PY11.	2,408	44,255
Portfolio Total		**16,125**	**1,582,965**

[1] PPL Electric Utilities. Annual Report Program Year 11: June 1, 2019–May 31, 2020. Presented to Pennsylvania Public Utility Commission. Prepared by Cadmus. February 15, 2021.
(2) Participants in the Home Energy Education and Student Energy Efficient Education programs are not available in January 2021 for the Semi-Annual Report and will be reported later in PY12 for the Annual Report.

5 Summary of Energy Impacts by Program

Figure 5 presents a summary of the PYTD reported gross energy savings by program for Program Year 12. The energy impacts in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses.

Figure 5: PYTD Reported Gross Energy Savings by Program

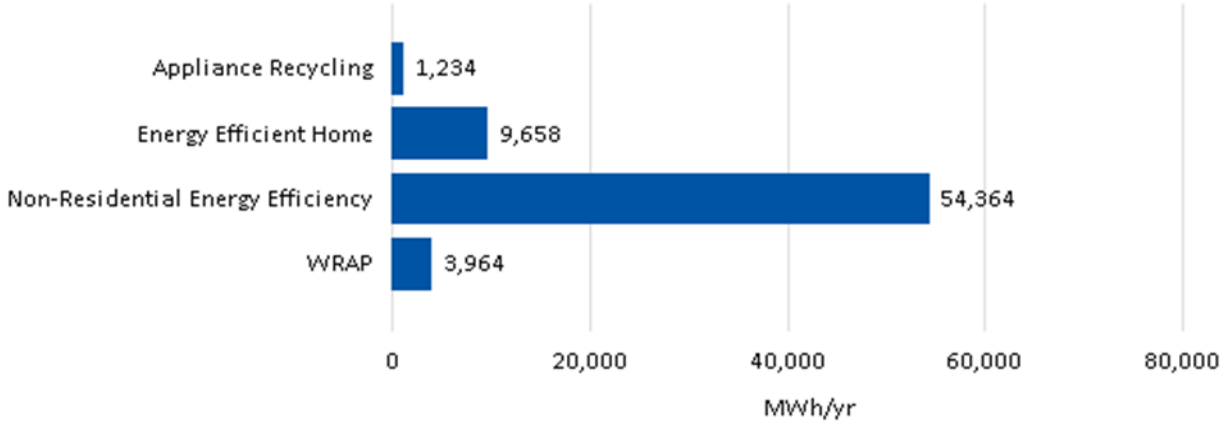
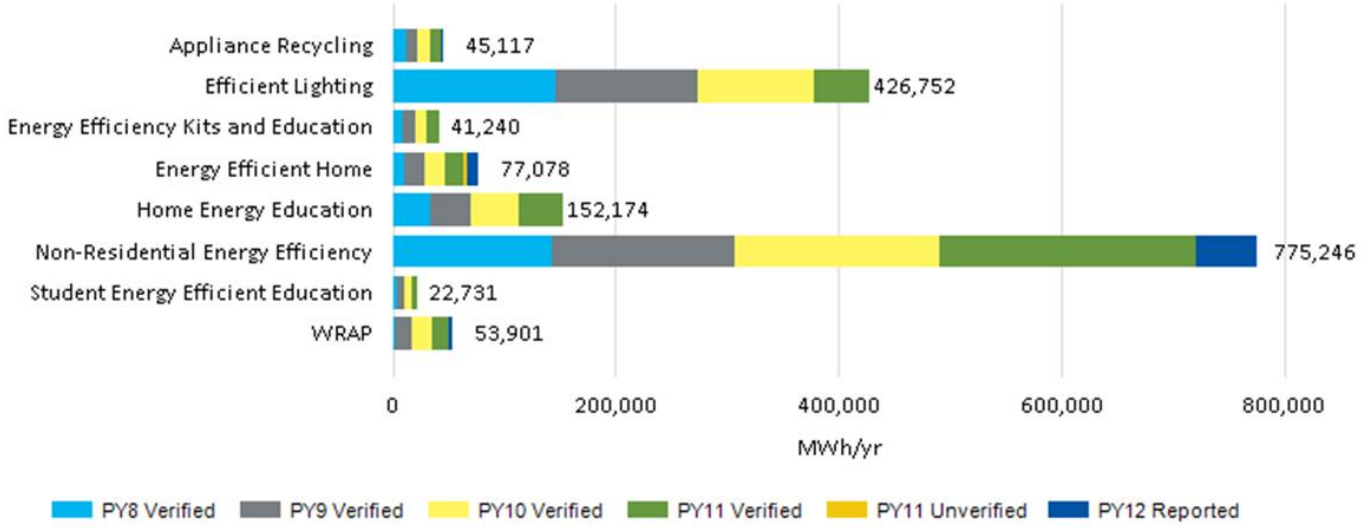


Figure 6 presents a summary of the PSA gross energy savings by program for Phase III of Act 129. PSA savings include verified gross savings from previous program years, unverified savings from PY11, and the PYTD savings from the current program year.

Figure 6: PSA Energy Savings by Program for Phase III



A summary of energy impacts by program through the current reporting period is presented in Table 6.

Table 6: Energy Savings by Program (MWh/Year)

Program	PYTD MWh/yr	RTD MWh/yr	VTD MWh/yr	Unverified Savings from PY11 MWh/yr	PSA MWh/yr [1]
Appliance Recycling	1,234	51,137	43,883	-	45,117
Efficient Lighting[2]	-	438,501	426,752	-	426,752
Energy Efficiency Kits and Education	-	48,719	41,240	-	41,240
Energy Efficient Home	9,658	82,679	63,336	4,084	77,078
Home Energy Education [3]	-	152,567	152,174	-	152,174
Non-Residential Energy Efficiency	54,364	792,861	720,882	-	775,246
Student Energy Efficient Education [3]	-	23,050	22,731	-	22,731
WRAP [4]	3,964	61,332	49,937		53,901
Total	**69,220**	**1,650,846**	**1,520,935**	**4,084**	**1,594,239**
Adjustment for Residential Home Energy Education Program Double-Counted Savings			(21,964)		(21,964)
Adjusted Portfolio Savings	**69,220**	**1,650,846**	**1,498,971**	**4,084**	**1,572,275**

[1] Total may not sum due to rounding. Includes unverified savings.
[2] 80,945 of PSA MWh/yr from Efficient Lighting are attributed to Small C&I (cross-sector sales).
[3] 6,863 of PSA MWh/yr from Student Energy Efficient Education and 1,564 of PSA MWh/yr from Home Energy Education are attributed to Low-Income.
[4] 50,991 of PSA MWh/yr from WRAP are attributed to Low-Income, 2,426 MWh/yr to GNE and 483 MWh/yr to Small C&I.

6 Summary of Demand Impacts by Program

PPL Electric Utilities' Phase III EE&C programs achieve peak demand reductions in two ways. The first is through coincident reductions from energy efficiency measures and the second is through dedicated demand response programs that exclusively target temporary demand reductions on peak days. Energy efficiency 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 demand response programs.

The two types of peak demand reduction savings are also treated differently for reporting purposes. Peak demand reductions from energy efficiency are generally additive across program years, meaning that the P3TD savings reflect the sum of the first-year savings in each program year. Conversely, demand response 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 energy efficiency and demand response are reported separately in the following sub-sections.

6.1 Energy Efficiency

Act 129 defines peak demand savings from energy efficiency 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 energy efficiency in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses. Figure 7 presents a summary of the PYRTD reported gross peak demand savings by energy efficiency program for Program Year 12.

Figure 7: PYRTD Gross Demand Savings by Energy Efficiency Program

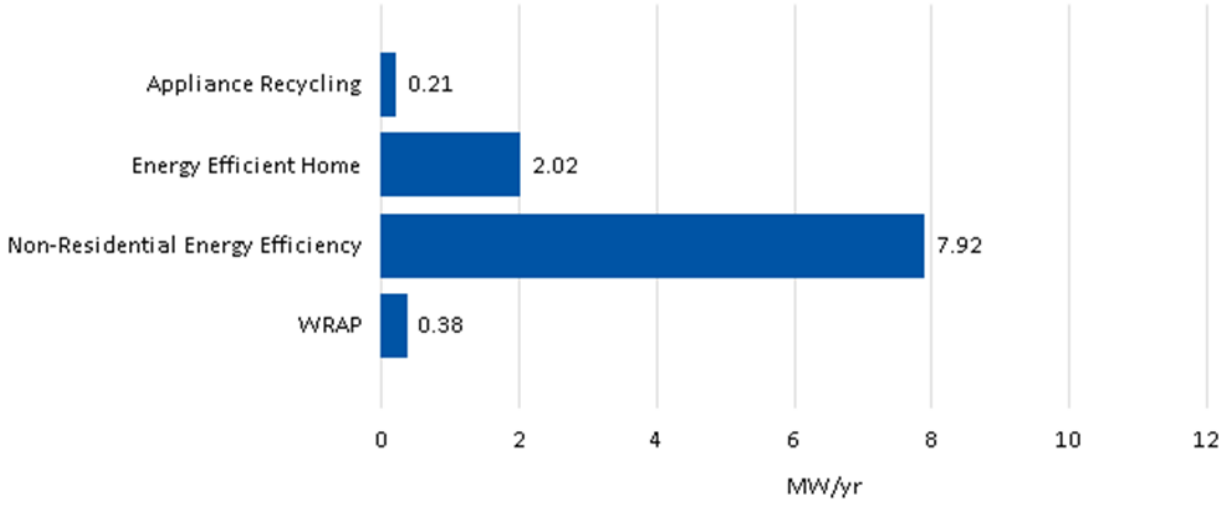
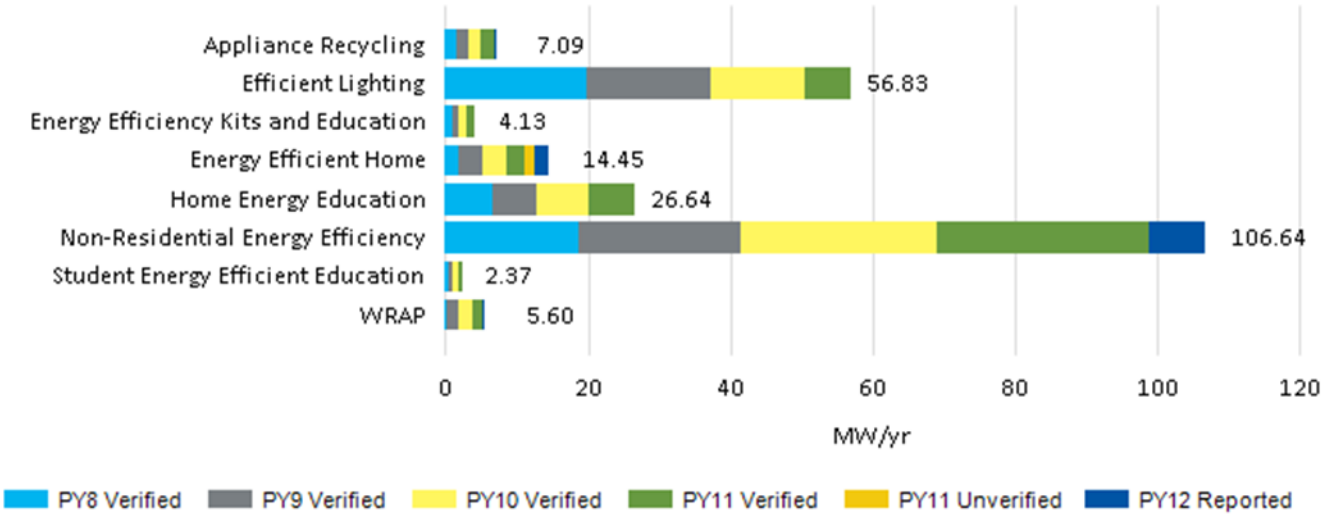


Figure 8 presents a summary of the PSA gross demand savings by energy efficiency program for Phase III of Act 129. This includes verified savings from previous years, unverified savings from PY11, and reported savings from PY12.

Figure 8: PSA Demand Savings by Energy Efficiency Program for Phase III



A summary of the peak demand impacts by energy efficiency program through the current reporting period are presented in Table 7.

Table 7: Peak Demand Savings by Energy Efficiency Program (MW/Year)

Program	PYTD MW/yr	RTD MW/yr	VTD MW/yr	Unverified Savings from PY11 MW/yr	PSA MW/yr [1]
Appliance Recycling	0.21	7.76	6.87	-	7.09
Efficient Lighting[2]	-	61.68	56.83	-	56.83
Energy Efficiency Kits and Education	-	3.43	4.13	-	4.13
Energy Efficient Home	2.02	15.19	11.05	1.38	14.45
Home Energy Education [3]	-	74.45	26.64	-	26.64
Non-Residential Energy Efficiency	7.92	108.62	98.73	-	106.64
Student Energy Efficient Education [3]	-	2.23	2.37	-	2.37
WRAP [4]	0.38	6.00	5.22	-	5.60
Total	**10.53**	**279.37**	**211.84**	**1.38**	**223.75**
Adjustment for Residential Home Energy Education Program Double-Counted Savings			**-2.446**		**-2.446**
Adjusted Portfolio Savings	**10.53**	**279.37**	**209.39**	**1.38**	**221.30**

[1]Total may not sum due to rounding. Includes PY11 unverified savings.
[2] 16.97 of PSA MW/yr from Efficient Lighting are attributed to Small C&I.
[3] 0.71 of PSA MW/yr from Student Energy Efficient Education and 0.26 of PSA MW/yr from Home Energy Education are attributed to Low-Income.
[4] 5.33 of PSA MW/yr from WRAP are attributed to Low-Income, 0.22 MW/yr to GNE and 0.04 MW/yr to Small C&I

6.2 Demand Response

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

1) Curtailment events shall be limited to the months of June through September.
2) Curtailment events shall be called for the first six days of each program year (starting in PY9) in which the peak hour of PJM's day-ahead forecast for the PJM 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 four hours.
4) Each curtailment event shall be called such that it will occur during the day's forecasted 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 demand response in this report are presented at the system level and reflect adjustments to account for transmission and distribution losses. PPL Electric Utilities uses the following line loss percentages/multipliers by sector.

- Residential = [8.75% or 1.0875]
- Small C&I = [8.75% or 1.0875]
- Large C&I = [4.2% or 1.0420]

Table 8 summarizes PYVTD and VTD demand reductions for each of the demand response programs in the EE&C plan and for the demand response portfolio as a whole. VTD demand reductions are the average performance across all Phase III demand response events independent of how many events occurred in a given program year. Phase III demand response compliance was determined on PY9 through PY11 demand reductions per the Pennsylvania Public Utility Commission's Phase III Modification Order.[7] The relative precision columns indicate the margin of error (at the 90% confidence interval) around the PYVTD and VTD demand reductions.

Table 8: Verified Gross Demand Response Impacts by Program

Program	PYVTD		Verified PY9-PY11 Compliance Period		VTD	
	Gross MW	Relative Precision (90%)	Gross MW	Relative Precision (90%)	Gross MW	Relative Precision (90%)
Demand Response	96.9	3.1%	112.8	1.8%	108.4	1.5%
Portfolio Total	**96.9**	**3.1%**	**112.8**	**1.8%**	**108.4**	**1.5%**

[7] Pennsylvania Public Utility Commission. June 3, 2020. *Phase III Modification Oder.* Docket No. M-2014-2424864. http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/energy_efficiency_and_conservation_ee_c_program.aspx

7 Summary of Finances

Section 7 provides an overview of the expenditures associated with PPL Electric Utilities' portfolio and the recovery of those costs from ratepayers.

7.1 Program Financials

Program-specific and portfolio total finances through the end of Q2 for PY12 are shown in Table 9. The columns in Table 9 and Table 10 are adapted from the 'Direct Program Cost' categories in the Commission's EE&C Plan template[8] 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 an EDC employs to support program delivery. The dollar amounts are based on EDC tracking of expenditures with no adjustments to account for inflation.[9]

Table 9: Program Year (PY12) to Date Financials ($1,000)

Program	Incentives to Participants and Trade Allies	EDC Materials, Labor, and Administration	ICSP Materials, Labor, and Administration	EM&V	Total (1)
Appliance Recycling Program	$27	$39	$629	-	$695
Demand Response Program	$1,407	$30	$550	-	$1,987
Efficient Lighting Program	$5	$19	$57	-	$82
Energy Efficiency Kits & Education Program (2)	-	$8	$0	-	$8
Energy Efficient Home Program	$1,443	$39	$1,386	-	$2,868
Home Energy Education Program		$22	$1,165	-	$1,187
Non-Residential Energy Efficiency	$4,118	$81	$2,122	-	$6,321
Student Energy Efficiency Education Program	-	$29	$491	-	$520
WRAP (2)	-	$75	$2,307	-	$2,382
Common Portfolio Costs (3)	-	$1,544	$414	$1,131	$3,089
Portfolio Total (4)	**$7,001**	**$1,886**	**$9,120**	**$1,131**	**$19,138**
SWE Costs (5)	-	--	-	-	**$200**
Total (4)	**$7,001**	**$1,886**	**$9,120**	**$1,131**	**$19,338**

(1) Total may not equal sum of column due to rounding.
(2) Costs associated with low income program measures provided to customers at no cost are categorized as administrative costs (rather than incentives to participants).
(3) Common Portfolio Costs are costs applicable to more than one customer class, to more than one program, or those that provide portfolio-wide benefits. These include PPL Electric Utilities labor and materials, costs related to PPL Electric Utilities' tracking system, EE&C plan development, etc.
(4) Portfolio Total and Total may not equal total of column due to rounding.
(5) Statewide Evaluation costs are outside of the 2% spending cap.

[8] Pennsylvania Public Utility Commission Phase III Energy Efficiency and Conservation Plan Template (Docket No. M-2014-2424864) dated July 21, 2015. (http://www.puc.pa.gov/pcdocs/1372426.doc)
[9] The cost-recovery of program expenses through riders generally happens promptly so that costs are being recovered from ratepayers in the same dollars that they are incurred.

Program-specific and portfolio total finances since the inception of Phase III are shown in Table 10.

Table 10: Phase III to Date Financials ($1,000)

Program	Incentives to Participants and Trade Allies	EDC Materials, Labor, and Administration	ICSP Materials, Labor, and Administration	EM&V	Total [1]
Appliance Recycling Program	$1,543	$235	$7,170	-	$8,948
Demand Response Program	$5,448	$300	$3,344	-	$9,093
Efficient Lighting Program	$23,410	$263	$6,385	-	$30,057
Energy Efficiency Kits & Education Program [2]	-	$200	$6,386	-	$6,586
Energy Efficient Home Program	$11,981	$273	$14,575	-	$26,828
Home Energy Education Program	-	$182	$6,858	-	$7,040
Non-Residential Energy Efficiency	$49,394	$867	$27,342	-	$77,603
Student Energy Efficiency Education Program	-	$225	$5,109	-	$5,334
WRAP [2]	-	$978	$31,616	-	$32,594
Common Portfolio Costs [3]	-	$13,474	$5,417	$11,695	$30,587
Portfolio Total [4]	**$91,775**	**$16,998**	**$114,202**	**$11,695**	**$234,670**
SWE Costs [5]	-	-	-	-	**$2,100**
Total [4]	**$91,775**	**$16,998**	**$114,202**	**$11,695**	**$236,770**

[1] Total may not equal sum of column due to rounding.
[2] Costs associated with low income program measures provided to customers at no cost are categorized as administrative costs.
[3] Common Portfolio Costs are costs applicable to more than one customer class, to more than one program, or those that provide portfolio-wide benefits. These include PPL Electric Utilities labor and materials, costs related to PPL Electric Utilities' tracking system, EE&C plan development, etc.
[4] Portfolio Total and Total may not equal total of column due to rounding.
[5] Statewide Evaluation costs are outside of the 2% spending cap.

Cost-effectiveness testing for Act 129 EE&C programs is performed using the 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 results for PY12 will be presented in the final annual report to the PA PUC on November 15, 2021 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. PPL Electric Utilities' cost-recovery charges are organized separately by 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 charges for electric service. Readers should be mindful of the differences between Table 11 and *Section 7.1*. For example, the low-income customer segment is a subset of PPL Electric Utilities' residential tariff(s) and therefore not listed in Table 11.

Table 11: EE&C Plan Expenditures by Cost-Recovery Category [1] ($1,000)

Cost Recovery Customer Sector	Rate Schedules Included	PYTD Spending	P3TD Spending
Residential & Low-Income	Residential (primarily RS)	$8,102	$117,237
Small C&I	Small C&I (primarily GS1 & GS3)	$3,738	$42,952
Large C&I	Large C&I (primarily LP4 & LP5)	$3,470	$34,571
GNE	Residential, Small C&I, and Large C&I	$1,538	$18,089
Common [2]	N/A	$2,491	$23,921
Portfolio Total [3]	-	**$19,338**	**$236,770**

[1] Includes SWE costs.
[2] Includes costs not collected at the sector level. These costs are allocated to the sectors at the end of the phase.
[3] Totals may not sum due to rounding.

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PPL Electric Utilities
Demand Response Annual Report to the Pennsylvania Public Utility Commission

PHASE III OF ACT 129 PY12 ANNUAL REPORT
(JUNE 1, 2020 – NOVEMBER 15, 2020)
FOR PENNSYLVANIA ACT 129 OF 2008
ENERGY EFFICIENCY AND CONSERVATION PLAN

Prepared by:
Cadmus

Prepared for:
PPL Electric Utilities

November 15, 2020

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1 Demand Response Program

To comply with the Pennsylvania Public Utility Commission's Act 129 Phase III demand response compliance targets, PPL Electric Utilities' Demand Response Program must reduce its system load (measured at the generator level) by an average of 92 MW during demand response events in PY9, PY10, and PY11 of Phase III.[1] In addition, PPL Electric Utilities is required to achieve a minimum of 85% of the 92 MW compliance target, or 78.2 MW, during each event during these program years. Compliance with Act 129 will not be based on performance in PY12 per the Pennsylvania Public Utility Commission's Phase III Modification Order that the Pennsylvania electric distribution companies may operate the demand response programs in PY12 on a voluntary basis.[2] The Commission modified the compliance requirements in response to disruptions to electric utility customer operations related to the COVID-19 pandemic. However, the Commission encouraged the utilities to operate their programs in PY12, and PPL Electric Utilities elected to continue operating the program for commercial and industrial (C&I) customers and for government, nonprofit, and education (GNE) customers.

PPL Electric Utilities manages the implementation conservation service provider (ICSP) and provides overall strategic direction for the program. CPower, the ICSP, enrolls and contracts with PPL Electric Utilities retail customers to reduce electricity demand during Act 129 demand response events.[3] After the summer season concludes, the ICSP makes performance-based payments to participating customers.[4]

Definition of a Participant

A participant in the Demand Response Program in PY12 is defined as a customer facility that participated in at least one of PPL Electric Utilities' Act 129 demand response events. The ICSP enrolled 43 customers representing 126 facilities in PY12. A total of 36 customers with 118 facilities participated in at least one Act 129 demand response event.

Program Participation and Reported Impacts

Table 1 presents the participation counts, reported demand reductions, and incentive payments for the Demand Response Program in PY12 by customer segment and Act 129 event. In PY12 (summer of 2020), there were five Act 129 events. The program reported demand savings of approximately 108.7 MW on

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1 Program objectives are stipulated on PPL Electric Utilities' revised EE&C Plan (Docket No. M-2015-2515642) filed with the Pennsylvania Public Utilities Commission in July 2018 and approved in November 2018.

2 Pennsylvania Public Utility Commission. June 3, 2020. *Phase III Modification Oder.* Docket No. M-2014-2424864. http://www.puc.pa.gov/filing_resources/issues_laws_regulations/act_129_information/energy_efficiency_and_conservation_ee_c_program.aspx

3 CPower, the ICSP, contracted with four PPL Electric Utilities' customer facilities through the demand response aggregators NRG, COI Energy Services, and Direct Energy.

4 In PY12, 43 customers representing 126 facilities were enrolled in the program; however, seven customers representing eight facilities did not participate in any events.

July 20, 103.0 MW on July 27, 79.4 MW on July 29, 93.3 MW on August 25, and 109.2 MW on August 27. Between 93% and 98% of the reported demand savings for each of these events were attributable to large C&I customers.

Table 1. PY12 Demand Response Program Participation and Reported Demand Reductions

Parameter	Small C&I (Non-GNE)	Large C&I (Non-GNE)	GNE	Total [1]
PYTD Number of Participants [2]	78	32	8	118
Event 1, July 20, 2020, Reported MW	1.0	104.6	3.1	108.7
Event 2, July 27, 2020, Reported MW	1.4	99.3	2.3	103.0
Event 3, July 29, 2020, Reported MW	2.5	73.7	3.1	79.4
Event 4, August 25, 2020, Reported MW	1.6	90.3	1.5	93.3
Event 5, August 27, 2020, Reported MW	0.3	106.7	2.2	109.2
Total Average Reported MW	**1.4**	**94.9**	**2.4**	**98.7**
PYVTD MW	**2.1**	**92.2**	**2.6**	**96.9**
PY12 Incentives ($1000)	**$26**	**$1,344**	**$37**	**$1,407**

The load impacts reported in this table have been grossed up to reflect transmission and distribution losses.
[1] Total may not equal total of row due to rounding.
[2] Number of facilities that participated in at least one event (118) in PY12, not the number enrolled in the program (126).

A dual-enrolled participant is a facility that participated in PPL Electric Utilities' Demand Response Program and is enrolled in a PJM demand response program. In PY12, all but three PPL Electric Utilities demand response program participants were dual-enrolled participants. Table 2 reports the number of these dual-enrolled and Act 129-only participating facilities and the incentives paid.

Table 2. PY12 Dual-Enrolled Participants (PPL Electric Utilities Act 129 and PJM programs)

Dual-Enrolled and Participating Customer Facilities	Act 129-Only and Participating Customer Facilities	Incentives Paid to Dual-Enrolled Customers	Incentives Paid to Act 129-Only Customers
115	3	$1,384,812.95	$22,193.68

1.1 Gross Savings Impact Evaluation

Impact Evaluation Data Collection and Sample Design

In PY12, 118 facilities operated by 36 customers of PPL Electric Utilities participated in one or more Act 129 demand response events. Table 3 shows the number of participating facilities by customer stratum. About two-thirds (66%) of the participants were small C&I facilities, one-quarter (27%) were large C&I customers, and the remainder (7%) were GNE customers.[5] Cadmus estimated load impacts for all participant facilities for one or more events.

[5] Appendix A.1 provides a count of participants by stratum for each Act 129 event in PY12.

Table 3. PY12 Program Sampling Strategy

Stratum	Population Size (Facilities)	Target Levels of Confidence & Precision	Target Sample Size	Achieved Sample Size	Evaluation Activity
Small C&I	78	NA	Census	78	Analysis of individual customer hourly consumption
Large C&I	32	NA	Census	32	
GNE	8	NA	Census	8	
Program Total	**118**	**NA**	**Census**	**118**	

Compliance targets for demand response programs were established at the generator level, which means load reductions measured at the customer meter must be increased to reflect transmission and distribution losses (line losses). The peak demand impact estimates presented in this report have been adjusted for these line losses. PPL Electric Utilities uses the following line loss percentages and/or multipliers by customer sector:

- Small C&I = [8.75% or 1.0875]
- Large C&I = [4.2% or 1.0420]

Cadmus evaluated each facility's demand savings by comparing the facility's metered demand during event hours with an estimated baseline. The baseline was estimated using either regression analysis or a day-matching method.[6] For each facility, Cadmus analyzed interval consumption data to identify the most accurate baseline calculation method. Additional details about the evaluation and baseline selection methodology are in *Appendix A*.

Gross Savings Impact Evaluation Results

PPL Electric Utilities met its Phase III Act 129 demand reduction compliance target specified in the Implementation Order and Phase III Modification Order. Figure 1 shows the PY9-PY11 gross verified savings, the basis for determining Phase III compliance. For Phase III, the verified Act 129 event load reductions were 112.8 MW (the average load reduction over PY9, PY10, and PY11 event hours), which exceeds the Phase III compliance target of 92 MW. In addition, in PY9, PY10, and PY11, PPL Electric Utilities met its per-event compliance target of at least 78.2 MW (85% of the total compliance target) in each demand response event.

Figure 1 also shows the gross verified savings for PY12 by event. In PY12, verified Act 129 event load reductions were 96.9 MW (equal to the average demand reduction over the five demand response events), a realization rate of 98.2% relative to the reported (*ex ante*) load reduction.

These verified load impacts are based on Cadmus analysis of participant AMI consumption data and have been grossed up to reflect transmission and distribution losses.

[6] Cadmus applied standard day-matching baseline calculation methods, such as selecting the seven days of the previous 10 with the highest average demand, in accordance with Statewide Evaluator (SWE) guidelines.

Figure 1. Gross Verified Savings Compared to Act 129 Targets, PY9-PY12

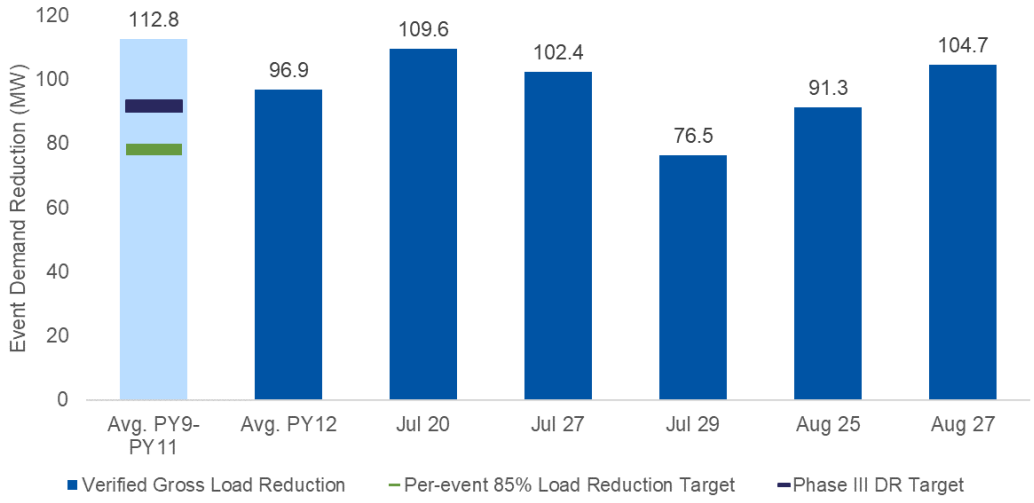


Table 4 shows PY12 Demand Response Program load reduction achievements by sector and demand response event.

Table 4. PY12 Demand Response Program Gross Impact Results for Demand by Sector

Stratum	Event	Number of Participants	PYRTD MW	Demand Realization Rate [1]	PYVTD MW [2]	Standard Error	Relative Precision at 90% C.L. [3]
Small C&I	**July 20, 2020**	77	1.0	204%	2.1	0.1	11.4%
	July 27, 2020	78	1.4	121%	1.6	0.1	14.6%
	July 29, 2020	78	2.5	80%	2.0	0.1	11.2%
	August 25, 2020	78	1.6	178%	2.9	0.1	8.3%
	August 27, 2020	77	0.3	543%	1.9	0.1	11.7%
Large C&I	**July 20, 2020**	28	104.6	99%	103.1	4.2	6.7%
	July 27, 2020	28	99.3	98%	97.5	4.2	7.0%
	July 29, 2020	22	73.7	97%	71.2	3.5	8.1%
	August 25, 2020	29	90.3	97%	87.6	4.1	7.7%
	August 27, 2020	30	106.7	95%	101.5	4.2	6.8%
GNE	**July 20, 2020**	8	3.1	143%	4.5	0.6	22.2%
	July 27, 2020	8	2.3	139%	3.2	0.6	29.3%
	July 29, 2020	7	3.1	106%	3.3	0.5	27.1%
	August 25, 2020	7	1.5	58%	0.9	0.4	78.7%
	August 27, 2020	4	2.2	58%	1.3	0.5	59.8%
Event [4]	**July 20, 2020**	113	108.7	101%	109.6	4.3	6.4%
	July 27, 2020	114	103.0	99%	102.4	4.2	6.8%
	July 29, 2020	107	79.4	96%	76.5	3.5	7.6%
	August 25, 2020	114	93.3	98%	91.3	4.1	7.4%
	August 27, 2020	111	109.2	96%	104.7	4.2	6.7%
Average	**-**	**112**	**98.7**	**98%**	**96.9**	4.1	3.1%

[1] Due to rounding, multiplying the PYRTD savings by the realization rate may not exactly equal the final verified savings.
[2] Based on Cadmus' analysis of participant AMI consumption data. MW were grossed up to reflect transmission and distribution losses.
[3] Precision accounts for covariances of facility savings across hours of each event but not between events.
[4] Total may not sum due to rounding.

The reported and evaluated savings were close, but the following factors may have contributed to differences between the reported and verified savings and to realization rates that deviated from 100%.

- **Different treatment of estimated readings**. The ICSP provided estimates rather than actual values for fewer than 1% of all hourly interval readings for participating facilities on event or weekdays that were not holidays or notification days between April 1, 2020, and September 11, 2020. Cadmus replaced these estimated readings with missing values and did not include them in the analysis dataset.
- **Different methods for calculating customer baselines.** To the extent possible, the ICSP attempted to align its baseline calculation method with Cadmus' method. However, whereas the ICSP employed day-matching, Cadmus employed regression analysis to calculate the baseline for 95% of small C&I facilities, 71% of GNE facilities, and 38% of large C&I facilities. The ICSP employed day-matching because it is transparent and easier for participants to understand savings (and anticipated incentives) than regression. Cadmus chose regression after determining this method yielded more accurate *ex post* savings estimates than day-matching.

1.2 Process Evaluation

Process Evaluation Data Collection and Sample Design

The process evaluation gathered program implementation details and assessed customer satisfaction with the Demand Response Program. Table 5 lists the process evaluation sampling strategy. Unlike the impact evaluation, which analyzed the entire population of participating facilities, the process evaluation attempted a survey of enrolled customers contracted by the ICSP CPower. Customers did not have to participate in an event in PY12 to qualify for the survey but must have enrolled for the PY12 program and received the event notifications.

Table 5. PY12 Process Evaluation Sampling Strategy

Stratum	Stratum Boundaries	Mode	Population Size	Assumed Proportion or Cv in Sample Design	Target Sample Size	Achieved Sample Size	Number of Records Selected for Sample Frame [1]	Percent of Sample Frame Contacted to Achieve Sample [2]
PPL Electric Utilities Program and ICSP Staff	Staff	Telephone in-depth Interview	2	N/A	2	2	2	N/A
Customer Surveys	Enrolled Companies Contracted by CPower	Online and telephone survey	38[3]	N/A	12	6	36	100%
Program Total			**40**	**N/A**	**14**	**8**	**38**	**N/A**

[1] Sample frame is the enrolled customer companies with contact information that were asked to complete the survey. The final sample frame includes unique records in the PPL Electric Utilities tracking database.
[2] Percent contacted means the percentage of the sample frame that were emailed to complete surveys.
[3] The ICSP contracted with 38 unique companies that enrolled in the PY12 Demand Response Program. Cadmus included all enrolled companies, even those that did not participate in any events, in its survey population. Cadmus did not survey the companies under contract with the demand response aggregators NRG, COI Energy Services, and Direct Energy. The survey population, therefore, differs from the population used in the impact evaluation. The impact evaluation counts as participants all facilities that participated in at least one event across CPower, NRG, COI Energy Services, and Direct Energy.

In October 2020, Cadmus contacted 36 enrolled companies by email and telephone, even if they did not participate in any PY12 events, to ask them to complete a short survey.[7]

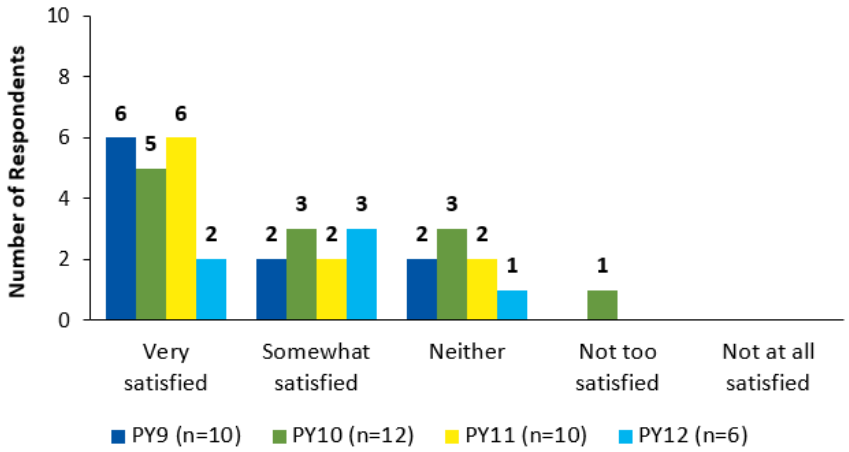
The survey was directed to the person who authorized the events at each company, typically an energy manager. Cadmus coordinated with the ICSP on emailing notice of the survey in advance. Cadmus made four attempts to gather survey responses. The first, second, and third attempts were by email; the fourth attempt was by telephone. Despite multiple attempts, Cadmus only gathered six completed surveys, which was less than the target of 12 completed surveys. Because of the small number of respondents, the expected confidence and precision levels for survey data are not reported here. Therefore, data gathered from the participant surveys should be viewed as qualitative.

Program Satisfaction

In PY12, five of six respondents were satisfied with the Demand Response Program—two were *very satisfied* and three were *somewhat satisfied*. No respondent reported being dissatisfied. Figure 2 shows overall satisfaction with the program for PY9 through PY12.

[7] Cadmus did not survey the enrolled customers under contract with the demand response sub-contractors NRG, COI Energy Services, and Direct Energy, only customers enrolled under contract with CPower.

Figure 2. Overall Satisfaction with Demand Response Program



Source: Survey question, "How would you rate your overall satisfaction with the Demand Response Program?"

The survey asked respondents a follow-up question about the reason for their program satisfaction rating. Three respondents answered the question. One *very satisfied* respondent said their rating was because of the simplicity of participation. One *somewhat satisfied* respondent said they were less than very satisfied due to a reduction in their incentive payments. The one respondent who said they were *neither satisfied nor dissatisfied* said it was because of the short notice, which made it challenging for their business.

1.3 Cost-Effectiveness Reporting

Cadmus will include a detailed breakdown of finances and cost-effectiveness for the Demand Response Program in the PY12 Annual Report due November 15, 2021, when program costs are finalized.

1.4 Recommendations

Because the program did well in PY12 and will not be delivered in Phase IV, Cadmus does not have any recommendations to make for the program.

Appendix A. Evaluation Detail – Demand Response Program

A.1 Evaluation Sampling Approach

The impact evaluation strategy is shown in Table A-1. Cadmus analyzed consumption data to estimate Act 129 demand response event load impacts in PY12 for the population of participating facilities. Participants were facilities that participated in at least one Act 129 demand response event and were associated with any of the four demand response aggregators—CPower or one of its subcontractors: NRG, COI Energy Services, or Direct Energy.

Table A-1. PY12 Demand Response Program Gross Impact Evaluation Design

Stratum	Event	Population Size [1]	Assumed Proportion or Cv in Sample Design	Target Sample Size	Achieved Sample Size	Impact Evaluation Activity
Small C&I	July 20, 2020	77	NA	77	77	Analysis of individual participating facility loads was performed for each event hour
	July 27, 2020	78	NA	78	78	
	July 29, 2020	78	NA	78	78	
	August 25, 2020	78	NA	78	78	
	August 27, 2020	77	NA	77	77	
Large C&I	July 20, 2020	28	NA	28	28	
	July 27, 2020	28	NA	28	28	
	July 29, 2020	22	NA	22	22	
	August 25, 2020	29	NA	29	29	
	August 27, 2020	30	NA	30	30	
GNE	July 20, 2020	8	NA	8	8	
	July 27, 2020	8	NA	8	8	
	July 29, 2020	7	NA	7	7	
	August 25, 2020	7	NA	7	7	
	August 27, 2020	4	NA	4	4	
Program Total [2]	**July 20, 2020**	**113**	**NA**	**113**	**113**	
	July 27, 2020	**114**	**NA**	**114**	**114**	
	July 29, 2020	**107**	**NA**	**107**	**107**	
	August 25, 2020	**114**	**NA**	**114**	**114**	
	August 27, 2020	**111**	**NA**	**111**	**111**	

[1] Population size is the count of facilities that participated in one or more Act 129 DR event hours as reported by the ICSP.

A.2 Ex Post *Verified Savings Methodology*

Cadmus analyzed advanced metering infrastructure (AMI) interval consumption data for each participating facility. A facility was defined as the area over which the participating customer's electricity consumption was metered and the load reductions measured during PY12 Demand Response Program period (June 1, 2020, through September 30, 2020). In PY12, 118 facilities participated in one or more Act 129 events.

Cadmus estimated the event load impacts for a facility as the difference between the facility's baseline electricity demand and metered demand, as shown in this equation:

$$\text{kW impact} = \text{Baseline kW} - \text{Metered kW}$$

Baseline demand is a counterfactual and represents what the facility's load would have been if the Act 129 demand response event had not been called. The baseline is unobservable and must be estimated. Accurate estimation of load impacts requires establishing a valid method for estimating the baseline. The methods Cadmus employed for estimating the baselines are described below.

Data Collection

Cadmus collected data from several sources to evaluate the PY12 Demand Response Program impacts. Table A-2 lists the data and sources.

PPL Electric Utilities provided 15-minute or one-hour interval consumption data between April 1, 2020, and September 11, 2020, for the participating facilities. Cadmus aggregated all facility 15-minute interval data to the hour level. A small percentage of intervals was estimated or included one or more estimated or missing 15-minute intervals. Cadmus flagged these observations and set them to missing for the analysis. Estimated readings were not used in the calculation of facility baselines or in estimating savings. Cadmus also screened the data for outliers but did not remove any observations.

Table A-2. Data Sources

Data	Population	Period	Variables	Source
Participant information data	Demand Response Program participant facilities	June 1, 2020 – September 30, 2020	Customer name, account number, business segment, ICSP baseline calculation method, enrolled MW, event hour participation indicators and reported load reductions, advance notification times, PJM economic market participation dates	CPower (ICSP)
PJM day-ahead forecasts and Act 129 event dates and hours	PPL Electric Utilities Demand Response Program participants	Summer 2020	Event dates and hours	PJM Interconnection LLC website
Facility interval consumption data	PPL Electric Utilities Demand Response Program participants	April 1, 2020– September 11, 2020	15 minute or hour interval kWh, estimated read indicator	PPL Electric Utilities
Weather	11 weather stations in PPL Electric Utilities service area	April 1, 2020– September 11, 2020	Dry-bulb temperature	NOAA
Solar radiation	Penn State, Pennsylvania SURFRAD site	April 1, 2020— September 11, 2020	Global horizontal irradiance	NOAA ESRL GMD
Line losses	Commercial and industrial electric utility customers	Phase III Act 129	Line loss factor	PA Technical Resource Manual (2016), Table 1-4

Baseline Calculation Approach

Day-Matching Customer Baselines and Regression Baselines

Cadmus estimated individual consumption baselines for each participating facility and event using either a day-matching approach or regression. Day-matching identifies a set of nearby, non-event, non-holiday weekdays for each event day, referred to as the basis window. For each event hour, the baseline is the average consumption during the same hour of the days or subset of days in the basis window.

The facility baseline regression models were estimated with data from days that almost qualified as Act 129 event days. These "almost Act 129 event days" were the 30 non-notification, non-holiday weekdays with the highest PJM day-ahead load forecasts that did not qualify as event days. The load on these days provided a natural baseline for assessing the impact of Act 129 events.

Selection of Facility Baseline Calculation Methods

Before the beginning of PY12, Cadmus assigned each participating facility to one of the following day-matching baseline calculation methods or a regression method:

- 2 previous days[8]
- 3 previous days
- 4 previous days
- 5 previous days
- 10 previous days
- 3 of 5 previous days with highest average load during event hours
- 4 of 5 previous days with highest average load during event hours 7 of 10 previous days with highest average load during event hours
- 3 previous days of the same day type (e.g., Wednesdays)
- 4 previous days of the same day type
- Regressions (one of 81 models)

Cadmus selected the most accurate baseline calculation method for each participating facility based on tests of predictive accuracy.[9]

Table A-3 shows counts of participating facilities by final baseline modeling approach for all facilities, by customer segment, and for 20 facilities with capacity enrollments greater than or equal to 1 MW. These 20 facilities accounted for 92% of enrolled capacity.

Many large C&I facilities used day-matching approaches because they had nearly constant demand or they had highly variable day-to-day demand, and regression did not predict better than day-matching methods. For these facilities, the best predictor of demand was the demand in days close to events, so Cadmus selected X-of-Y-previous-day baseline methods for many large C&I facilities.

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[8] When selecting basis days, Cadmus excluded previous weekend days, holidays, Act 129 event days, and Act 129 event notification days from the basis window.

[9] Cadmus performed a separate analysis for each facility, selecting the day-matching or regression baseline method that performed best in terms of accuracy, bias, and variability (risk). It assessed the accuracy of the baseline using relative root mean squared error (RRMSE), bias using mean absolute percentage error (MAPE) and median percentage prediction error, and variability using the distribution of errors. Cadmus calculated and plotted the distribution of errors to see if for a small number of hours the models predicted poorly.

Table A-3. Number of Facilities by Baseline Modeling Approach

Baseline	All Facilities	GNE	Large C&I	Small C&I	DR Capacity ≥ 1 MW
2 OF 2	4	-	4	-	4
3 OF 3	1	-	1	-	1
3 OF 5	4	2	2	-	1
4 OF 4	-	-	-	-	-
4 OF 5	4	-	2	2	1
5 OF 5	2	-	1	1	1
7 OF 10	5	-	5	-	5
10 OF 10	3	-	3	-	2
Day of Week 4 of 4	3	-	2	1	2
Day of Week 3 of 3	-	-	-	-	-
Regression	92	6	12	74	3
Total	**118**	**8**	**32**	**78**	**20**

Impacts of COVID-19 on Baseline Calculation Approach

The COVID-19 pandemic affected the operations and electricity consumption of many PPL Electric Utilities C&I customers, especially at the beginning of the pandemic in spring 2020. A concern is that the baseline calculation methods tested in previous years of normal business operations might perform poorly and not yield accurate estimates of demand savings for the demand response program participants during the COVID pandemic.

To investigate the validity of the baseline calculation methods, Cadmus started by plotting hourly consumption between April 1, 2020, and September 10, 2020, for all participant facilities. Many participants exhibited electricity consumption patterns similar to in previous years, and no COVID impacts were evident. For other participants, particularly for big-box retail stores and other retailers, it was obvious that business operations had been disrupted, as electricity consumption remained below normal and the levels observed in previous years. However, in June, as the Pennsylvania economy reopened, it appears many impacted businesses resumed normal operations and electricity consumption increased to expected levels. These normal operations persisted through summer. This lessened Cadmus' concerns that the existing baseline calculation methods may not be valid.

In addition, Cadmus conducted an interim evaluation of the demand response savings for the July 20, 2020, event to evaluate the performance of the baseline calculation methods and the reasonableness of the savings estimates. For the six participant facilities with the greatest committed capacity (91 MW), Cadmus estimated demand savings within 11% of the committed capacity. In addition, Cadmus verified that the baseline calculation methods predicted accurately for recent non-event (placebo) days in July.

Overall, Cadmus concluded that despite the COVID pandemic disruptions, the baseline calculation methods remained valid and it was unnecessary to adjust them.

Act 129 Events in Program Year 12

Table A-4 presents the Act 129 event dates, hours, advance notification date and times, and the average outside temperature during events in PY12.

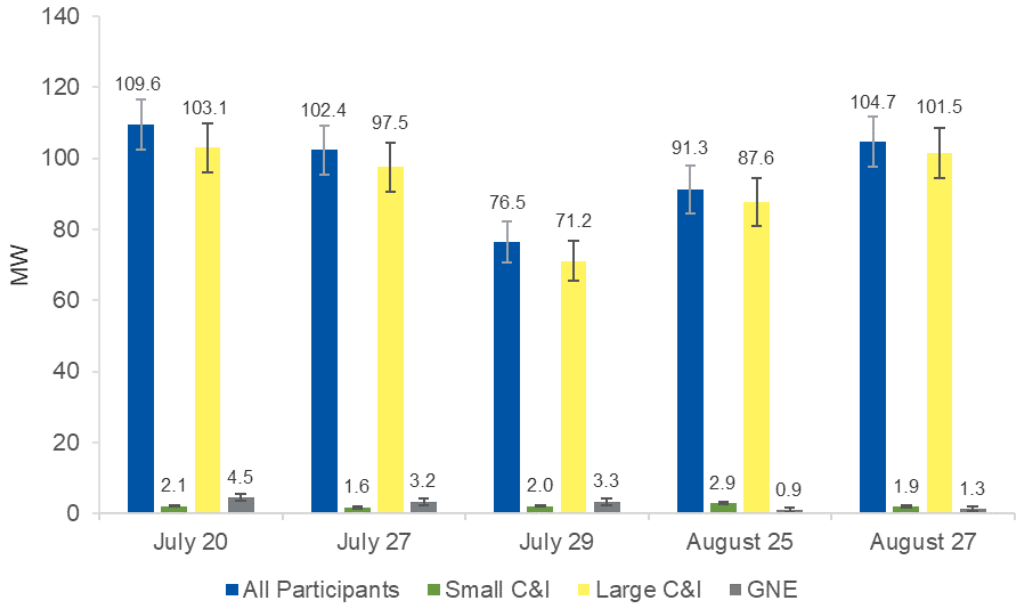
Table A-4. PY12 Act 129 Events Dates and Times

Event Date	Event Hours	Advance Notification Date and Time	Average Outside Temperature (°F) During Event
Monday, July 20, 2020	2:00 p.m. – 6:00 p.m.	Sunday, July 19, 2020, at 10:42 a.m.	89.2
Monday, July 27, 2020	2:00 p.m. – 6:00 p.m.	Sunday, July 26, 2020, at 10:23 a.m.	89.6
Wednesday, July 29, 2020	3:00 p.m. – 7:00 p.m.	Tuesday, July 28, 2020, at 10:35 a.m.	88.6
Tuesday, August 25, 2020	2:00 p.m. – 6:00 p.m.	Monday, August 24, 2020, at 10:32 a.m.	84.6
Thursday, August 27, 2020	3:00 p.m. – 7:00 p.m.	Wednesday, August 26, 2020, at 10:32 a.m.	90.5
Note: Advance notification times were obtained from CPower, the ICSP, through Cadmus data request.			

Results and Discussion

The estimates of program and customer segment demand savings for each PY12 Act 129 event date are presented in Figure 1 and Table 4 in the main content of this report (*Gross Savings Impact Evaluation Results*). In Figure A-1, Cadmus presents the results graphically. Unless noted otherwise, all demand load impacts have been adjusted for line losses.

Figure A-1. PPL Electric Utilities Act 129 Gross Verified Demand Savings, PY12



Notes: Estimates based on Cadmus analysis of AMI interval consumption data for participant facilities. Error bars show 90% confidence intervals. All savings estimates were adjusted for line losses.

In PY12, PPL Electric Utilities achieved average demand savings of 96.9 MW across the five 2020 Act 129 events. PPL Electric Utilities achieved the maximum event demand savings of 109.6 MW on July 20 and the minimum event demand savings of 76.5 MW on July 29. As Figure A-1 shows, large C&I customers were responsible for between 93% and 97% of the gross verified demand response savings depending on the event.

Table A-5 reports the gross verified demand savings, metered demand, estimated baseline demand, and the percentage demand savings by event for each customer segment and the program. All MW/hour have been adjusted for line losses and reflect demand at the generator. On average, the program produced demand savings of 47% relative to baseline consumption. The small C&I sector produced savings between 6% and 10% of baseline demand. The GNE sector produced savings between 14% and 50% of baseline demand. The large C&I sector produced savings between 50% and 57% of baseline demand.

Table A-5. Gross Verified Demand Savings, Metered Demand, and Baseline Demand by Customer Segment and Event

Stratum	Event	Gross Verified Demand Savings (MW/hour)	Metered Demand (MW/hour)	Baseline Demand (MW/hour)	Relative Precision at 90% C.L.	Percentage Demand Savings
Small C&I	July 20, 2020	2.1	27.3	29.3	11.4%	7.1%
	July 27, 2020	1.6	28.9	30.6	14.6%	5.4%
	July 29, 2020	2.0	26.7	28.7	11.2%	7.1%
	August 25, 2020	2.9	25.7	28.6	8.3%	10.0%
	August 27, 2020	1.9	26.6	28.5	11.7%	6.6%
Large C&I	July 20, 2020	103.1	81.5	184.6	6.7%	55.8%
	July 27, 2020	97.5	72.5	170.1	7.0%	57.4%
	July 29, 2020	71.2	56.0	127.2	8.1%	56.0%
	August 25, 2020	87.6	87.6	175.2	7.7%	50.0%
	August 27, 2020	101.5	83.9	185.4	6.8%	54.8%
GNE	July 20, 2020	4.5	6.9	11.4	22.2%	39.3%
	July 27, 2020	3.2	7.2	10.5	29.3%	31.0%
	July 29, 2020	3.3	5.9	9.3	27.1%	35.9%
	August 25, 2020	0.9	5.2	6.1	78.7%	14.1%
	August 27, 2020	1.3	1.3	2.5	59.8%	49.4%
All Participants	July 20, 2020	109.6	115.7	225.3	6.4%	48.7%
	July 27, 2020	102.4	108.7	211.1	6.8%	48.5%
	July 29, 2020	76.5	88.6	165.1	7.6%	46.3%
	August 25, 2020	91.3	118.6	209.9	7.4%	43.5%
	August 27, 2020	104.7	111.8	216.4	6.7%	48.4%
Average	-	96.9	108.7	205.6	3.1%	47.1%

Note: All MW/hour have line loss adjustments applied and represent demand at the generator. Event totals may not sum due to rounding. Difference between baseline demand and metered demand may not equal the gross verified demand savings due to rounding. The percentage demand savings may not equal the ratio of gross verified demand savings to baseline demand due to rounding.

A.3 Survey Participant Profile

Of the 38 enrolled companies (contracted by CPower, the ICSP), 68% had one facility enrolled in the PY12 program, 58% were manufacturing facilities, and 45% participated in all five events. The surveys captured six respondents.

These six survey respondents represented approximately 22% of the total enrolled demand response capacity (138.3 MW) in PY12.

Survey Sample Attrition

Table A-6 lists total contacts, the outcome (final disposition) of each record, and response rate.

Table A-6. PY12 Demand Response Participant Survey Sample Attrition Table

Description of Survey Outcomes	Count
Population (number of CPower, NRG, COI Energy Services, and Direct Energy enrolled facilities)	**126**
Removed: NRG, COI Energy Services, and Direct Energy contracted facilities	6
Removed: Duplicate facility contacts for managers with multiple enrolled facilities	82
Sample Frame (number of unique companies)	**38**
Removed: Records with no contact information	2
Survey Sample Frame (used for surveys)	**36**
Not started	26
Refused or opted out	4
Completed Surveys (online and telephone combined)	**6**
Response Rate (completed surveys divided by number of records)	**17%**