

Semi-Annual Report to the Pennsylvania Public Utility Commission

Phase III of Act 129

Program Year 8

(June 1, 2016 – May 31, 2017)

For Pennsylvania Act 129 of 2008

Energy Efficiency and Conservation Plan

Prepared by Cadmus

For

PPL Electric Utilities

July 17, 2017

Table of Contents

ACRONYMS	III
TYPES OF SAVINGS	IV
SECTION 1 INTRODUCTION	1
SECTION 2 SUMMARY OF ACHIEVEMENTS	2
2.1 CARRYOVER SAVINGS FROM PHASE II OF ACT 129	2
2.2 PHASE III ENERGY EFFICIENCY ACHIEVEMENTS TO DATE	4
2.3 PHASE III DEMAND RESPONSE ACHIEVEMENTS TO DATE.....	7
2.4 PHASE III PERFORMANCE BY CUSTOMER SEGMENT	7
SECTION 3 UPDATES AND FINDINGS	9
3.1 IMPLEMENTATION UPDATES AND FINDINGS.....	9
3.2 EVALUATION UPDATES AND FINDINGS	10
SECTION 4 SUMMARY OF PARTICIPATION BY PROGRAM	12
SECTION 5 SUMMARY OF ENERGY IMPACTS BY PROGRAM	14
SECTION 6 SUMMARY OF DEMAND IMPACTS BY PROGRAM	17
6.1 ENERGY EFFICIENCY	17
6.2 DEMAND RESPONSE	20
SECTION 7 SUMMARY OF FINANCES	20
7.1 PROGRAM FINANCIALS.....	20
7.2 COST RECOVERY	22

Figures

FIGURE 1: CARRYOVER SAVINGS FROM PHASE II OF ACT 129	2
FIGURE 2: CUSTOMER SEGMENT-SPECIFIC CARRYOVER FROM PHASE II	3
FIGURE 3: EE&C PLAN PERFORMANCE TOWARD PHASE III PORTFOLIO COMPLIANCE TARGET	5
FIGURE 4: EE&C PLAN PERFORMANCE TOWARD PHASE III LOW-INCOME COMPLIANCE TARGET	6
FIGURE 5: EE&C PLAN PERFORMANCE AGAINST PHASE III GNE COMPLIANCE TARGET	7
FIGURE 6: PYTD REPORTED GROSS ENERGY SAVINGS BY PROGRAM	14
FIGURE 7: PSA ENERGY SAVINGS BY PROGRAM FOR PHASE III	15
FIGURE 8: PYRTD GROSS DEMAND SAVINGS BY ENERGY EFFICIENCY PROGRAM	18
FIGURE 9: PSA DEMAND SAVINGS BY ENERGY EFFICIENCY PROGRAM FOR PHASE III	19

Tables

TABLE 1: P3TD SAVINGS CALCULATION EXAMPLE	V
TABLE 2. CALCULATION OF SECTOR-LEVEL CARRYOVER FROM PHASE II.....	3
TABLE 3: PY8 SUMMARY STATISTICS BY CUSTOMER SEGMENT	8
TABLE 4: PHASE III SUMMARY STATISTICS BY CUSTOMER SEGMENT	8
TABLE 5: EE&C PLAN PARTICIPATION BY PROGRAM	12
TABLE 6: ENERGY SAVINGS BY PROGRAM (MWH/YEAR).....	16
TABLE 7: PEAK DEMAND SAVINGS FROM ENERGY EFFICIENCY PROGRAM (MW/YEAR).....	19
TABLE 8: PROGRAM YEAR TO DATE FINANCIALS (\$1,000)	20
TABLE 9: PHASE III TO DATE FINANCIALS	21
TABLE 10: EE&C PLAN EXPENDITURES BY COST-RECOVERY CATEGORY.....	22

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, Non-Profit, 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). For PY8, the PSA savings will always equal the PYTD savings because PY8 is the first program year of the phase (no savings will be verified until the PY8 final annual report).

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

Section 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 8 (PY8), as well as the cumulative accomplishments of the Phase III programs since inception. This report additionally documents the energy savings carried over from Phase II. The Phase II carryover savings count towards EDC savings compliance targets for Phase III.

This report details the participation, spending, and reported gross impacts of the energy efficiency programs in PY8. 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 PY8 energy efficiency programs will be reported in the final annual report, to be filed on November 15, 2017.

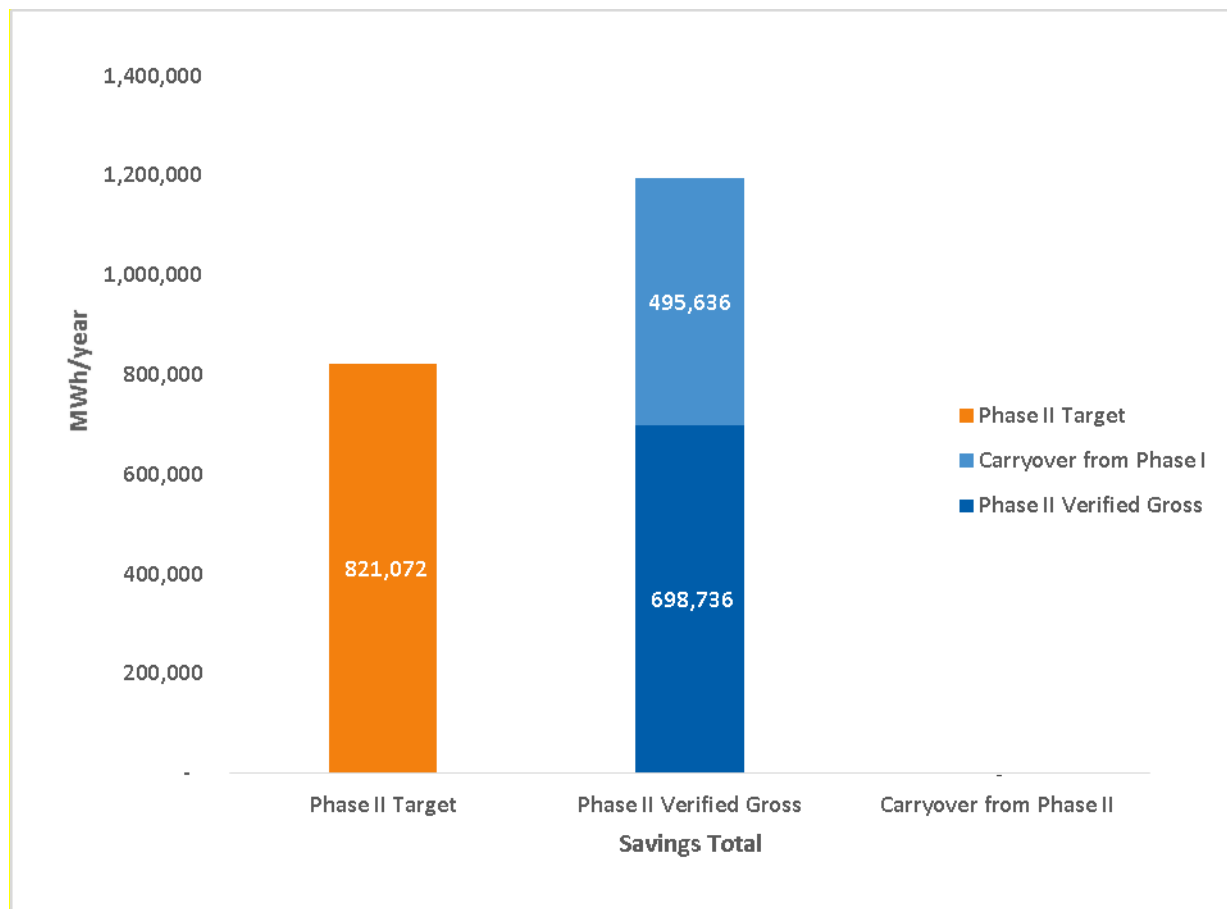
Phase III of Act 129 includes a demand response goal for PPL Electric Utilities. Demand response events are limited to the months of June through September, which are the first four months of the Act 129 program year. Because the demand response season is completed early in the program year, it is possible 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 [PYX] as well as the cumulative demand response performance of the EE&C program to date for Phase III of Act 129.

Section 2 Summary of Achievements

2.1 CARRYOVER SAVINGS FROM PHASE II OF ACT 129

PPL Electric Utilities does not have portfolio-level 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.

Figure 1: Carryover Savings from Phase II of Act 129¹



The Commission's Phase III Implementation Order² also allowed EDCs to carry over savings in excess of the Phase II Government, Non-Profit, and Educational (GNE) savings goal and

¹ Phase I carryover into Phase II cannot contribute to the Phase II carryover into Phase III. Therefore, PPL Electric Utilities has no Phase II carryover into Phase III at the portfolio level.

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

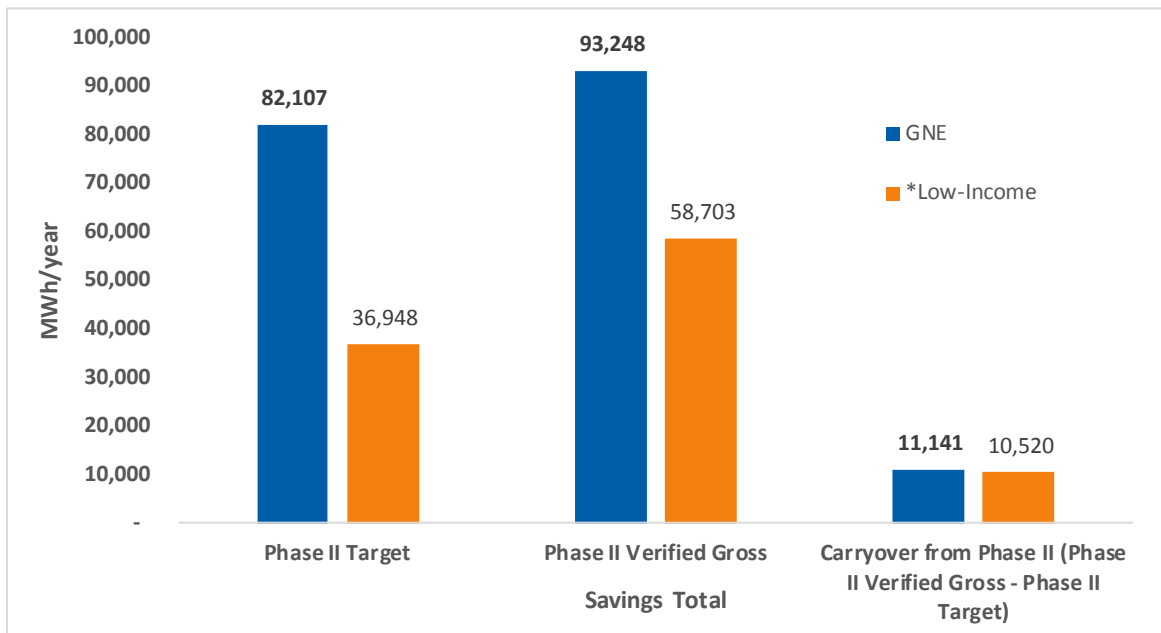
excess savings from the low-income customer segment.³ Table 2 shows the calculation of carryover savings for the low-income and GNE targets and Figure 2 illustrates these savings.

Table 2. Calculation of Sector-Level Carryover from Phase II

Sector	Phase II Target	Phase II Verified Gross	Carryover from Phase II (Phase II Verified Gross - Phase II Target)
GNE	82,107	93,248	11,141
Low-Income ¹	36,948	58,703	10,520

¹ Although PPL Electric reported a low-income carryover savings figure of 10,299 MWh/yr in its Final Annual Report for Phase II, the Commission adopted the SWE’s calculated figure of 10,520 MWh/yr.

Figure 2: Customer Segment-Specific Carryover from Phase II



*Although PPL Electric reported a low-income carryover savings figure of 10,299 MWh/yr in its Final Annual Report for Phase II, the Commission adopted the SWE’s calculated figure of 10,520 MWh/yr.

PPL Electric Utilities observes that the Commission’s Phase II Compliance Order entered on April 6, 2017, at Docket No. M-2012-2289411 initially denied carrying over the excess Phase II low-income and GNE savings. PPL Electric Utilities disputed this finding in its Petition for Reconsideration filed on April 21, 2017. At the time of this report’s submission, PPL Electric Utilities’ Petition for Reconsideration of the Commission’s determination remains pending before the Commission.

³ Proportionate to those savings achieved by dedicated low-income programs in Phase III.

2.2 PHASE III ENERGY EFFICIENCY ACHIEVEMENTS TO DATE

Since the beginning of Program Year 8 on June 1, 2016, PPL Electric Utilities has claimed:

- 380,028 MWh/yr of reported gross electric energy savings (PYRTD)
- 100.81 MW/yr of reported gross peak demand savings (PYRTD) from energy efficient programs
- 0 MW/yr of reported gross peak demand savings (PYRTD) from demand response programs because the program did not call events in PY8

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

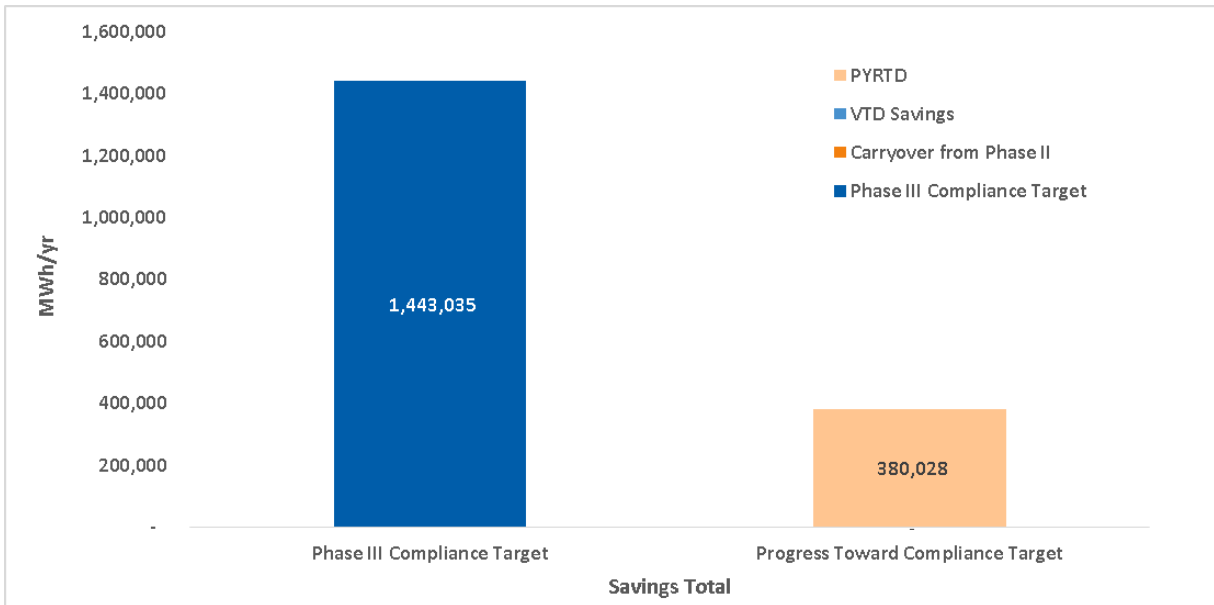
- 380,028 MWh/yr of reported gross electric energy savings (RTD)
- 100.81 MW/yr of reported gross peak demand savings (RTD) from energy efficiency programs
- 0 MW/yr of reported gross peak demand savings (RTD) from demand response programs because the program did not call events in PY8

- 380,028 MWh/yr of gross electric energy savings (PSA). This total includes verified gross savings from previous Phase III program years and the PYTD reported gross savings from PY8
- 100.81 MW/yr of gross peak demand savings (PSA) from energy efficiency programs
- 0 MW/yr of reported gross peak demand savings (PSA) from demand response programs because the program did not call events in PY8

PPL Electric Utilities has achieved:

- 380,028 MWh/yr of PSA+CO energy savings recorded to date in Phase III
 - This represents 26% of the May 31, 2021, energy savings compliance target of 1,443,035 MWh/yr.

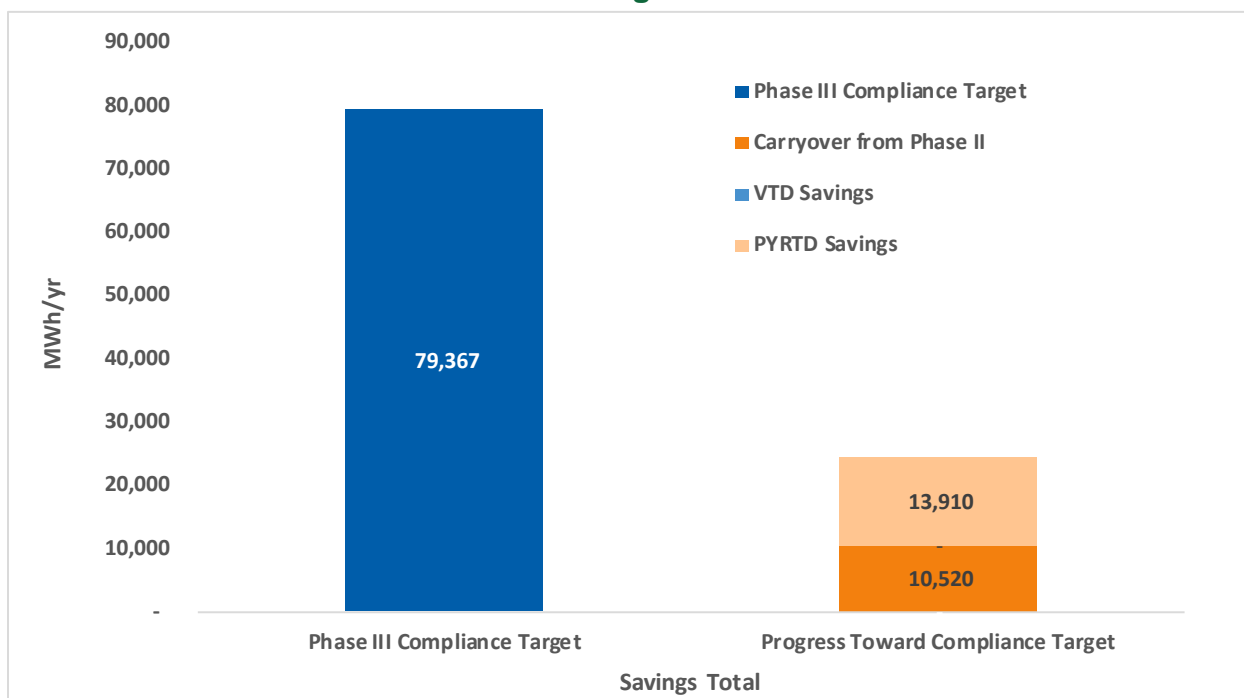
Figure 3: EE&C Plan Performance Toward Phase III Portfolio Compliance Target



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 65 EE&C measures to its residential and non-residential customer classes⁴. There are 23 PPL Electric Utilities measures available to the low-income customer segment at no cost to the customer. This represents 35% 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 and is based on verified gross savings. Figure 4 compares the PSA+CO performance to date for the low-income customer segment to the Phase III savings target. Based on the latest available information, PPL Electric Utilities has reported 18% of the Phase III low-income energy savings target, not including verified low-income carryover from Phase II.

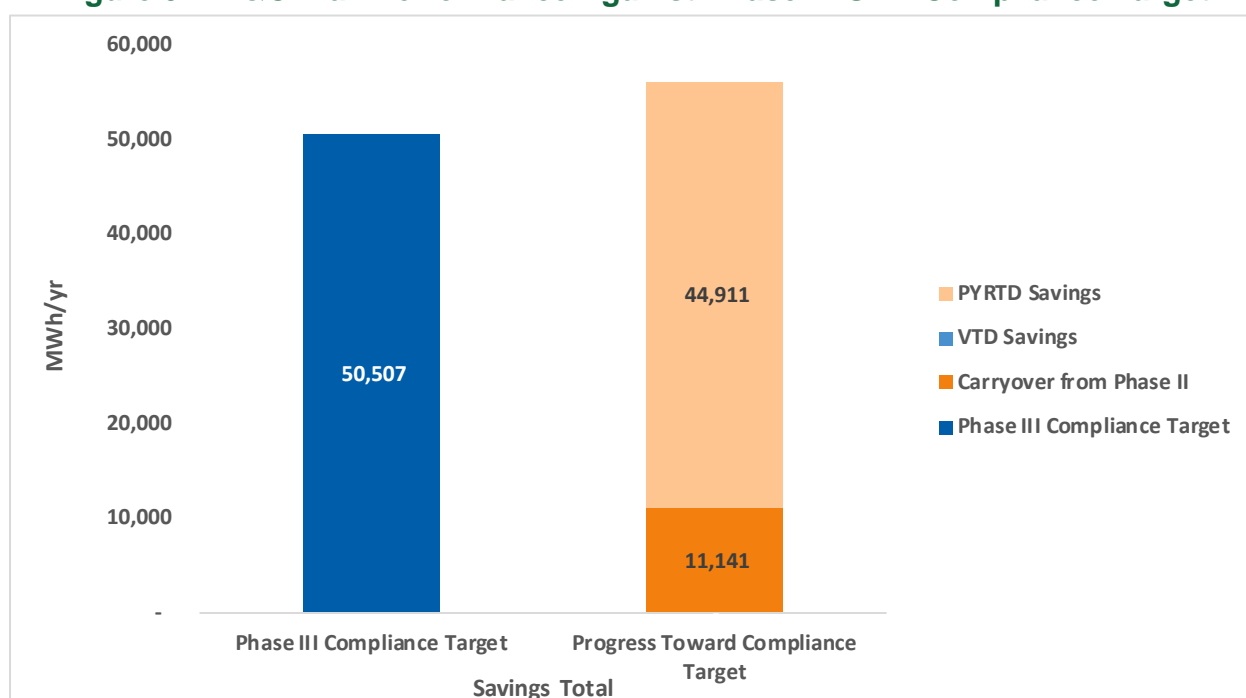
Figure 4: EE&C Plan Performance Toward Phase III Low-Income Compliance Target



⁴ PPL Electric Utilities. PPL Electric Utilities Energy Efficiency and Conservation Plan Act 129 Phase III. Before the Pennsylvania Public Utility Commission. Docket No. M-2015-2515642. Compliance Filing April 22, 2016. Available online: https://www.pplelectric.com/~media/pplelectric/save%20energy%20and%20money/docs/act129_phase3/phase%203revised%20planfinalclean.pdf?la=en

The Phase III Implementation Order established a government, non-profit, 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 and is based on verified gross savings. Figure 5 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 89% of the Phase III GNE energy savings target, with reported savings in PY8, not including carryover from Phase II.

Figure 5: EE&C Plan Performance Against Phase III GNE Compliance Target



2.3 PHASE III DEMAND RESPONSE ACHIEVEMENTS TO DATE

PPL Electric Utilities did not implement curtailment events in PY8. The program's ICSP enrolled customers during PY8 (June 1, 2016, to May 31, 2017) and will initiate events during the summers of PY9, PY10, PY11, and PY12.

2.4 PHASE III PERFORMANCE BY CUSTOMER SEGMENT

Table 3 presents the participation, savings, and spending by customer sector for PY8. The residential, small C&I, large C&I sectors are defined by EDC tariff and the residential low-income and governmental/educational/non-profit sector were defined by statute (66 Pa. C.S. § 2806.1). The residential low-income segment is a subset of the residential customer class and

the GNE segment will include 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: PY8 Summary Statistics by Customer Segment

Parameter	Residential (Non-Low Income)	Low Income	Small C&I	Large C&I	GNE	Portfolio Total ¹
Number of participants	844,160	14,835	22,336	183	548	882,062
PYRTD MWh/yr	176,493	13,910	80,966	63,748	44,911	380,028
PYRTD MW/yr (Energy Efficiency)	70.92	1.09	14.86	6.45	7.49	100.81
PYVTD MW (Demand Response)	0	0	0	0	0	0
Incentives (\$1000) ²	\$12,180	\$0	\$4,159	\$3,555	\$2,563	\$22,458

¹ Portfolio total may not equal sum of columns due to rounding.
² Costs associated with low income program measures provided to customers at no cost are categorized as administrative costs.

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

Table 4: Phase III Summary Statistics by Customer Segment

Parameter	Residential (Non Low Income)	Low Income	Small C&I	Large C&I	GNE	Portfolio Total ¹
Number of participants	844,160	14,835	22,336	183	548	882,062
PSA MWh/yr	176,493	13,910	80,966	63,748	44,911	380,028
PSA MW (Energy Efficiency)	70.92	1.09	14.86	6.45	7.49	100.81
Phase III MW (Demand Response)	0	0	0	0	0	0
Incentives (\$1000) ²	\$12,180	\$0	\$4,159	\$3,555	\$2,563	\$22,458

¹ Portfolio total may not equal sum of columns due to rounding.
² Costs associated with low income program measures provided to customers at no cost are categorized as administrative costs.

Section 3 Updates and Findings

3.1 IMPLEMENTATION UPDATES AND FINDINGS

- **Appliance Recycling:** The program launched in early June 2016. Customers have provided PPL Electric with positive feedback about the return of this program. Over eleven thousand participants recycled refrigerators, freezers, and room air conditioners.
- **Custom:** The program launched June 1, 2016 with an entirely new customer facing website and online rebate application portal. A significant number of combined heat and power (CHP) projects have been submitted, especially from the GNE customer sector. The custom program continues to be a source of projects with comprehensive measures, including CHP and advanced lighting systems. The TRC threshold for custom projects was adjusted in a plan change to encourage comprehensive measures. This change has been successful in allowing PPL Electric Utilities to increase savings through the custom route.
- **Demand Response:** PPL Electric Utilities' ICSP enrolled 92 customers in the program either through their prime ICSP, CPower, or sub-contractors during PY8 (June 1, 2016, to May 31, 2017). PPL Electric Utilities will initiate events during the summer of PY9. The number of customers enrolled will generate about 141 MWh/yr. Additional customers under review may contribute another 10 MWhr/yr.
- **Efficient Equipment:** The program launched June 1, 2016 with an entirely new customer facing website and online rebate application portal. The new website provides both customers and trade allies the ability to securely upload all project documentation and track the status of application submissions in real time.
 - The Distributor Discount offering is a new component of the Efficient Equipment program, and launched in November 2016. This is a midstream offering, providing incentives to commercial lighting distributors. The program has been well received by the market with 14 distributors and 59 locations now participating.
 - The Direct Discount component of the program—where contractors work directly with small businesses to offer discounted products—launched in January 2017. The program has focused incentives on integrated LEDs, controls, compressed air and refrigeration. The ICSP has also conducted seven sector specific customer webinars since November 2016 to foster a direct to customer approach using low cost channels.
- **Efficient Lighting:** The upstream lighting program launched June 1, 2016. PPL Electric has seen strong LED bulb sales over the first year of the program with sales exceeding 3,000,000 bulbs and over 75,000 LED fixtures.
- **Energy-Efficiency Kits and Education:** The Energy Efficiency Kits and Education program launched June 1, 2016, and targets income eligible customers. The program is

well underway with over 12,000 kits delivered through direct mail or one of the 22 participating agencies. About 126,000 LEDs have been distributed between all of the low-income programs. No major issues have affected implementation.

- **Energy Efficient Home:** All components of this residential program launched June 1, 2016 with the exception of the online assessment component. This component launched in late October 2016. The new customer facing website and online rebate application portal have been well received by customers. Over 3,000 customers have completed the online assessment and received an energy efficiency kit for their home.
- **Home Energy Education:** The program launched June 1, 2016. The program sends Home Energy Reports to customers; it is not a rebate program. Customers continue to provide positive feedback about the improvements made to the Home Energy Reports in Phase III.
- **Low-Income WRAP:** The 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 over 2,700 jobs, including participants in the Manufactured Home initiative. Interest in WRAP for multifamily buildings has generated a lead list of over 6,000 individual low-income tenants (combination of individual and master-metered).
- **Student Energy Efficient Education:** The program launched June 1, 2016. The program was fully subscribed for PY8 (fall 2016) and reached over 24,000 children at approximately 200 schools, including over 24,000 kits being distributed to participating children.

3.2 EVALUATION UPDATES AND FINDINGS

This section summarizes evaluation activities occurring within each program during PY8:

- **Appliance Recycling:** Cadmus has completed the following impact evaluation activities: database review, first and second quarter records verification and accompanying reconciliation memo. Cadmus has completed the following process evaluation activities: stakeholder interviews, online and telephone surveys with participants and non-participants. Outstanding evaluation activities include third and fourth quarter records verification, gross and net savings analyses, survey analysis and final reporting.
- **Custom:** Cadmus, the ICSP, and PPL Electric reviewed communication and site visit protocols and the measure savings calculator. Cadmus researched appropriate measure life for RCx projects to compare prior year cost effectiveness testing and TRMs. Advanced lighting controls projects will be submitted under the Custom program. The ICSP will meter the projects to develop a site-specific savings factor. Cadmus conducted interviews with trade allies. Cadmus conducted monthly online participant surveys and quarterly telephone surveys.

- **Demand Response:** Cadmus finalized the EM&V plan and received approval. Cadmus received interval consumption data for summer 2016 for PPL Electric's industrial, commercial, and GNE customers eligible for the program. Cadmus used these data to test methods for estimating customer baselines. In addition, Cadmus determined the most appropriate baseline for each customer recruited into the program.
- **Efficient Equipment:** Cadmus selected equipment and lighting project samples for all quarters and requested data from the implementer. Cadmus performed site visits at 10 unique equipment sites and reviewed project documentation for 15 equipment measures. Cadmus plans to perform 11 additional site visits for the PY8 verification. Cadmus performed site visits at 43 lighting sites and plans to complete 26 additional site visits for the PY8 verification. Cadmus conducted interviews with trade allies. Cadmus conducted monthly online participant surveys and quarterly telephone surveys.
 - **Distributor Discount:** In the second half of PY8, Cadmus worked closely with the ICSP to ensure that their calculations and reporting for the program met the intention of the Lighting Improvements for Midstream Interim Measure Protocol (IMP). Cadmus reviewed program data files, drew samples, and began site visits for the PY8 impact evaluation. The PY8 sample size was reduced from 68 projects to 63 due to lower-than-planned participation in the program. For the process evaluation, Cadmus conducted interviews with PPL Electric and ICSP program staff and 7 participating distributors. Outstanding process evaluation activities include interviews with lighting purchasers and participant profile analyses.
- **Efficient Lighting:** Cadmus conducted interviews with PPL Electric and ICSP program staff, fielded both residential and commercial general population telephone surveys and completed verification activities for the first three quarters. Outstanding evaluation activities include finalization of the cross-sector sales analysis and Q4 database review and manufacturer invoice audits.
- **Energy-Efficiency Kits and Education:** Cadmus received final PY8 survey and enrollment data from the ICSP and confirmed that it contains the necessary data for Phase III evaluation activities. Cadmus conducted a phone survey with program participants who did not return their paper survey included in the energy efficiency kit. Cadmus has completed all stakeholder and agency interviews. Cadmus received the final data from PPL Electric Utilities, and are preparing the data for analysis.
- **Energy Efficient Home:** Cadmus developed the HVAC, HPWH, and audit and weatherization trade ally interview guides and new homes builder interview guides and began fielding trade ally interviews and participant surveys. Cadmus completed all stakeholder and implementer interviews. Cadmus received the final PY8 data for all program components and confirmed that it contains the necessary data for evaluation activities. Cadmus selected samples for all components, and requested data from the implementer.

- Home Energy Education:** Cadmus conducted program staff interviews with PPL, the ICSP, and the ICSP’s subcontractor. Information collected from the interviews helped to design the customer survey and low-propensity survey instruments. Cadmus completed fielding the customer surveys with treatment group (n=375) and control group (n=375); survey data have been weighted, analyzed, and tested for statistical significance. The low-propensity survey with the customers who did not opt back into the program is in progress. Cadmus prepared and submitted the data request needed for the billing analysis to determine program energy savings.
- Low-Income WRAP:** Cadmus completed program staff interviews with PPL, the ICSP, and the ICSP’s subcontractor, and began gathering contact information for implementer interviews. Cadmus finalized recruitment letters and drew a sample for participant site visits. Cadmus developed a data collection tool and staff training materials for site visits. Outstanding PY8 evaluation activities include participant phone surveys, implementer interviews, audit records review, site visits, gross savings analysis and final reporting.
- Student Energy Efficient Education:** Cadmus has completed all stakeholder interviews with PPL, the ICSP and the ICSP’s subcontractor. Cadmus received final PY8 Home Energy Worksheets completed by students and confirmed that it contains the necessary data for evaluation activities. Cadmus conducted an online survey with participating teachers, and analyzed survey responses. Cadmus received the final program data from PPL Electric Utilities, and they are preparing the data for analysis.

Section 4 Summary of Participation by Program

Participation is defined for each program, and can vary by program, depending on the delivery channel and data tracking practices. The participant definitions are summarized by program in the bullets below. Table 5 provides the current participation totals for PY8 and Phase III.

Table 5: EE&C Plan Participation by Program

Program	Participant Definition	PYTD Participation	P3TD Participation
Appliance Recycling	Unique CSP job ID	11,368	11,368
Custom	Customer project that received an incentive payment between June 1, 2016, and May 31, 2017	74	74
Efficient Equipment	Unique CSP job ID	1,750	1,750
Efficient Lighting	Jobs are reported as weekly bulb sales by product. The number of participants is determined by dividing the total number of bulbs sold or distributed by a bulbs-per-participant estimate derived from general residential and small C&I population survey respondents who reported having purchased bulbs.	332,628	332,628

Program	Participant Definition	PYTD Participation	P3TD Participation
Energy Efficiency Kits and Education	Unique CSP job ID	12,117	12,117
Energy Efficient Home	Unique CSP job ID	11,401	11,401
Home Energy Education	Unique CSP job ID	509,120	509,120
Low Income WRAP	Unique CSP job ID	2,718	2,718
Student Energy Efficient Education	Number of kits	24,145	24,145
Portfolio Total		905,321	905,321

Section 5 Summary of Energy Impacts by Program

Figure 6 presents a summary of the PYTD reported gross energy savings by program for Program Year 8. The energy impacts in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses.

Figure 6: PYTD Reported Gross Energy Savings by Program

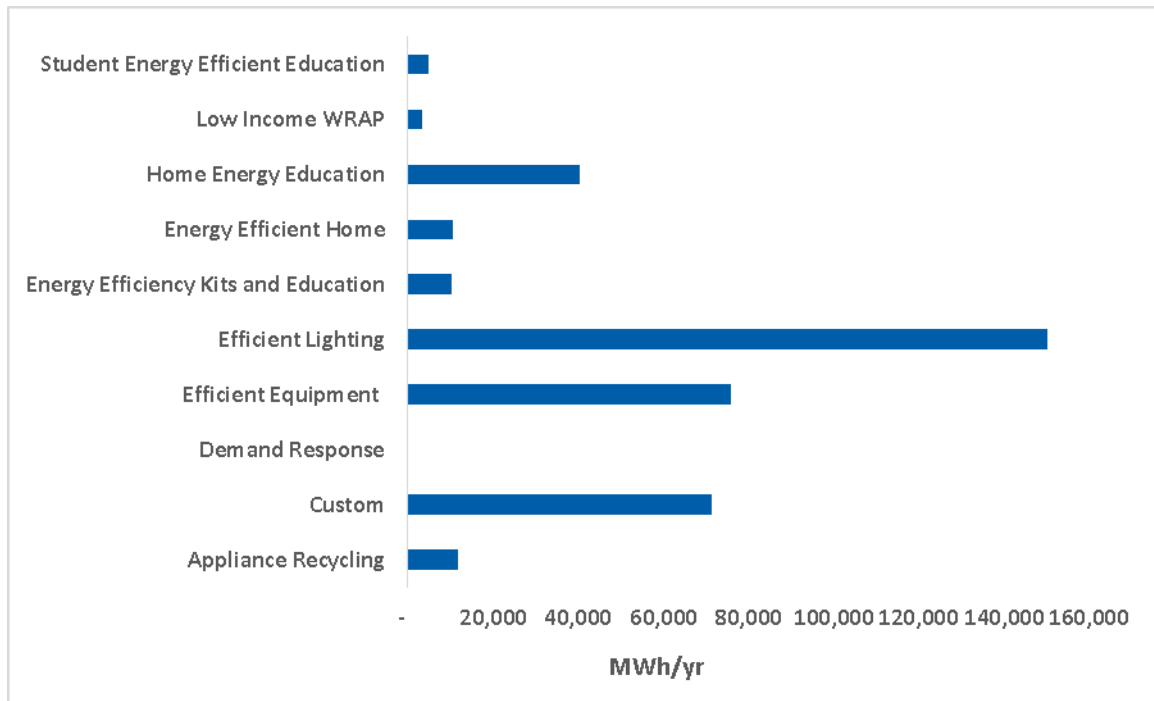
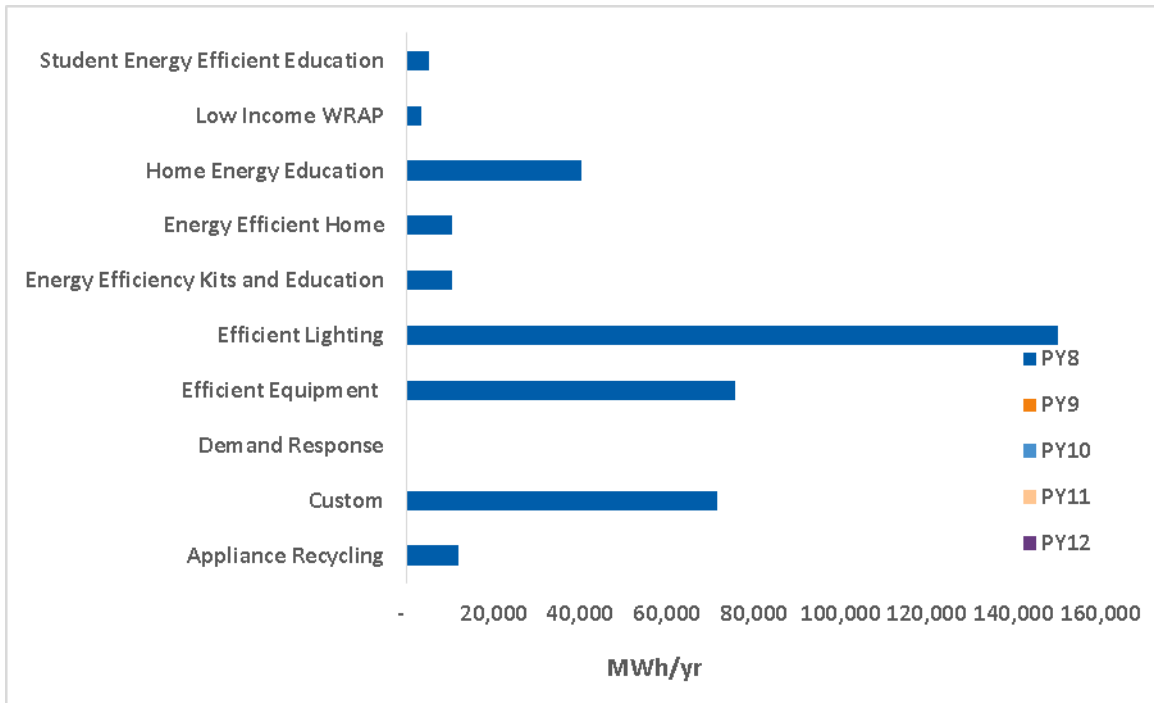


Figure 7 presents a summary of the PSA gross energy savings by program for Phase III of Act 129. PSA savings include verified gross savings from previous program years and the PYTD savings from the current program year.

Figure 7: 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 Name	PYTD MWh	RTD	VTD	PSA
Appliance Recycling	12,035	12,035	-	12,035
Custom	71,565	71,565	-	71,565
Demand Response	-	-	-	-
Efficient Equipment	75,936	75,936	-	75,936
Efficient Lighting	150,376	150,376	-	150,376
Energy Efficiency Kits and Education	10,420	10,420	-	10,420
Energy Efficient Home	10,621	10,621	-	10,621
Home Energy Education	40,467	40,467	-	40,467
Low Income WRAP	3,491	3,491	-	3,491
Student Energy Efficient Education	5,118	5,118	-	5,118
Portfolio Total ¹	380,028	380,028	-	380,028

¹ Portfolio total does not equal total of column due to rounding.

Section 6 Summary of Demand Impacts by Program

PPL Electric Utilities' Phase III EE&C programs achieve peak demand reductions in two primary ways. The first is through coincident reductions from energy efficiency measures and the second is through dedicated demand response offerings 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 8 presents a summary of the PYRTD reported gross peak demand savings by energy efficiency program for Program Year 8.

Figure 8: PYRTD Gross Demand Savings by Energy Efficiency Program

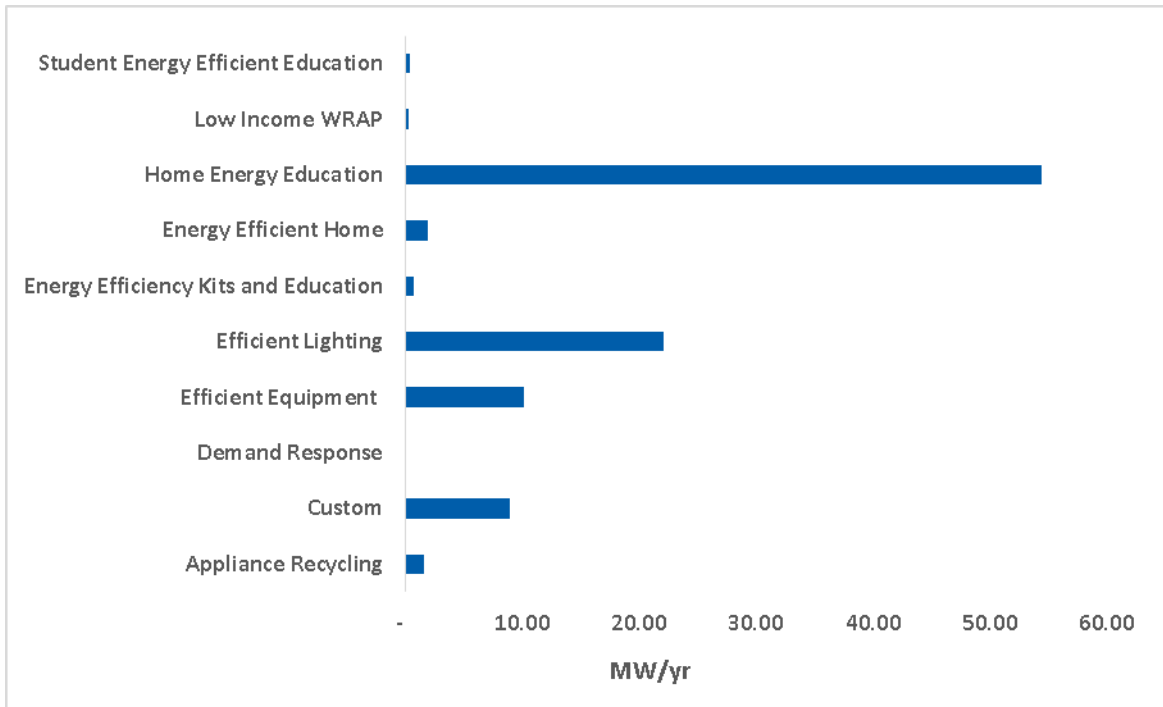
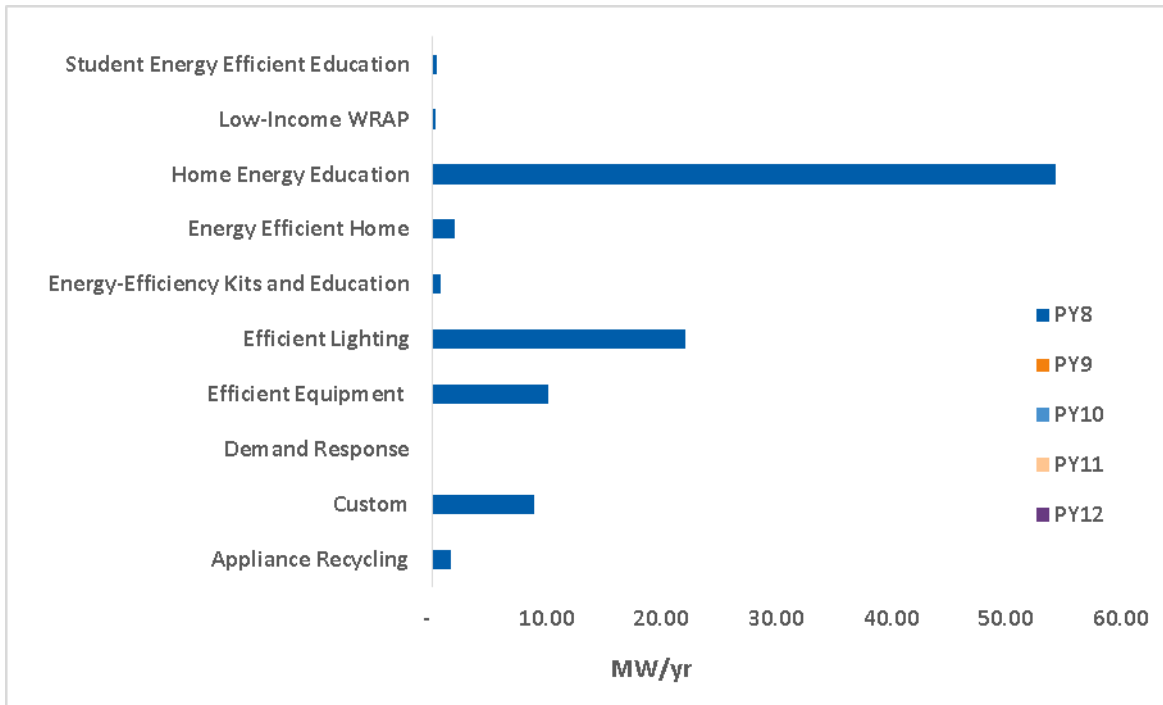


Figure 9 presents a summary of the PSA gross demand savings by energy efficiency program for Phase III of Act 129.

Figure 9: 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 From Energy Efficiency Program (MW/Year)

Program Name	PYTD MW	RTD	VTD	PSA
Appliance Recycling	1.65	1.65	-	1.65
Custom	8.97	8.97	-	8.97
Demand Response	-	-	-	-
Efficient Equipment	10.15	10.15	-	10.15
Efficient Lighting	22.15	22.15	-	22.15
Energy-Efficiency Kits and Education	0.75	0.75	-	0.75
Energy Efficient Home	1.95	1.95	-	1.95
Home Energy Education	54.39	54.39	-	54.39
Low-Income WRAP	0.34	0.34	-	0.34
Student Energy Efficient Education	0.46	0.46	-	0.46
Portfolio Total ¹	100.81	100.81	-	100.81

¹ Portfolio total does not equal total of column due to rounding.

6.2 DEMAND RESPONSE

PPL Electric Utilities did not implement curtailment events in PY8. The program's ICSP enrolled customers during PY8 (June 1, 2016, to May 31, 2017) and will initiate events during the summers of PY9, PY10, PY11, and PY12

Section 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 for PY8 are shown in Table 8. The columns in Table 8 and Table 9 are adapted from the 'Direct Program Cost' categories in the Commission's EE&C Plan template⁵ 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 and EDCs employs to support program delivery.

Table 8: Program Year 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 ⁵
Appliance Recycling Program	\$341	\$200	\$1,405	-	\$1,945
Custom Program	\$4,325	\$588	\$2,438	-	\$7,351
Demand Response Program	-	\$148	\$499	-	\$647
Efficient Equipment Program	\$4,546	\$591	\$2,141	-	\$7,279
Efficient Lighting Program	\$11,513	\$347	\$1,302	-	\$13,162
Energy Efficiency Kits & Education Program ¹	-	\$174	\$1,721	-	\$1,894
Energy Efficient Home Program	\$1,734	\$265	\$2,939	-	\$4,937
Home Energy Education Program	-	\$182	\$663	-	\$845
Low-Income WRAP Program ¹	-	\$574	\$3,438	-	\$4,012
Student Energy Efficiency Education Program	-	\$231	\$674	-	\$905
Common Portfolio Costs²	-	\$3,399	\$1,412	\$2,110	\$6,922
Portfolio Total³	\$22,458	\$6,700	\$18,631	\$2,110	\$49,899
SWE Costs⁴	-	-	-	-	\$700

⁵ <http://www.puc.pa.gov/pcdocs/1372426.doc> Section 10

Program	Incentives to Participants and Trade Allies	EDC Materials, Labor, and Administration	ICSP Materials, Labor, and Administration	EM&V	Total ⁵
Total ⁵	\$22,458	\$6,700	\$18,631	\$2,110	\$50,599

¹ Costs associated with low income program measures provided to customers at no cost are categorized as administrative costs.

² 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 labor and materials, costs related to the EEMIS tracking system, EE&C plan development, etc.

³ Portfolio Total and Total may not equal total of column due to rounding.

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

⁵ Total may not equal sum of column due to rounding.

Program-specific and portfolio total finances since the inception of Phase III are shown in Table 9.

Table 9: Phase III to Date Financials

Program	Incentives to Participants and Trade Allies	EDC Materials, Labor, and Administration	ICSP Materials, Labor, and Administration	EM&V	Total ⁵
Appliance Recycling Program	\$341	\$200	\$1,405	-	\$1,945
Custom Program	\$4,325	\$588	\$2,438	-	\$7,351
Demand Response Program	-	\$148	\$499	-	\$647
Efficient Equipment Program	\$4,546	\$591	\$2,141	-	\$7,279
Efficient Lighting Program	\$11,513	\$347	\$1,302	-	\$13,162
Energy Efficiency Kits & Education Program ¹	-	\$174	\$1,721	-	\$1,894
Energy Efficient Home Program	\$1,734	\$265	\$2,939	-	\$4,937
Home Energy Education Program	-	\$182	\$663	-	\$845
Low-Income WRAP Program ¹	-	\$574	\$3,438	-	\$4,012
Student Energy Efficiency Education Program	-	\$231	\$674	-	\$905
Common Portfolio Costs ²	-	\$3,399	\$1,412	\$2,110	\$6,922
Portfolio Total ³	\$22,458	\$6,700	\$18,631	\$2,110	\$49,899
SWE Costs ⁴	-	-	-	-	\$700
Total ⁵	\$22,458	\$6,700	\$18,631	\$2,110	\$50,599

¹ Costs associated with low income program measures provided to customers at no cost are categorized as administrative costs.

² 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 labor and materials, costs related to the EEMIS tracking system, EE&C plan development, etc.

³ Portfolio Total may not equal total of column due to rounding.

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

⁵ Total may not equal sum of column due to rounding.

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 PY8 will be presented in the final annual report to the PA PUC on November 15, 2017 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 organized separately by 8 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 10 and Section 2.4. For example, the low-income customer segment is a subset of PPL Electric Utilities' residential tariff(s) and therefore not listed in Table 10.

Table 10: EE&C Plan Expenditures by Cost-Recovery Category

Cost Recovery Customer Sector	Rate Schedules Included	PYTD Spending (\$1000)	P3TD Spending (\$1000)
Residential & Low Income	RS and RTS	\$27,597	\$27,597
Small Commercial and Industrial (Small C&I)	GS-1, GS-3, BL, SA, SM (R), SHS, TS (R), and GH-2 (R)	\$6,460	\$6,460
Large commercial and Industrial (Large C&I)	LP-4, LP-5, LPEP and L5S	\$6,511	\$6,511
GNE	All rate schedules above	\$4,430	\$4,430
Common ^{1,6}	N/A	\$5,601	\$5,601
Portfolio Total ²	-	\$50,599	\$50,599

¹ Common costs are assigned to each customer sector at the conclusion of Phase III.
² Portfolio total may not equal sum of rows due to rounding.
⁶ Includes SWE costs.