

Kimberly A. Klock
Senior Counsel

PPL
Two North Ninth Street
Allentown, PA 18101-1179
Tel. 610.774.5696 Fax 610.774.6726
KKlock@pplweb.com



July 26, 2017

FEDERAL EXPRESS

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

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

**Re: Preliminary Annual Report for the Period June 2016
through May 2017, Program Year Eight (8)
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") is the Preliminary Annual Report for Program Year Eight (8), of PPL Electric's Act 129 Plan. Please note that the enclosed report revises the report PPL Electric filed July 17, 2017 named "Semi-Annual Report to the Pennsylvania Public Utility Commission." This report contains the following revisions:

- Changed the title page from Semi-Annual to Preliminary Annual Report
- Changed the header from Semi-Annual to Preliminary Annual Report
- Changed the name of the document from Semi-Annual Report to Preliminary Annual Report
- Changed the HEE participant count to 184,257 in Table 5
- Changed the participant definition for HEE to unique account #
- Adjusted the sum of all participants in Table 5
- Updated the number of participants in tables 3 and 4 (customer segment tables)

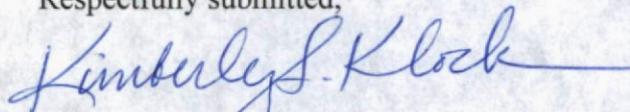
Rosemary Chiavetta, Secretary

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July 26, 2017

In addition, please date and time-stamp the enclosed extra copy of this letter and return it to me in the envelope provided.

Respectfully submitted,



Kimberly A. Klock

Enclosure

cc: Richard F. Spellman (GDS Associates, Inc. Act 129 Statewide Evaluator

Preliminary 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

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

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Acronyms

| | |
|--------|---|
| BDR | Behavioral Demand Response |
| C&I | Commercial and Industrial |
| 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 |

$PYRTD (PY10) = 500 \text{ MWh/year}$

$RTD = 800 + 900 + 500 = 2,200 \text{ MWh/year}$

$VTD = 700 + 850 = 1,550 \text{ MWh / year}$

$PSA = 1,550 + 500 = 2,050 \text{ MWh/year}$

$PSA + CO = 2,050 + 400 = 2,450 \text{ MWh/year}$

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.

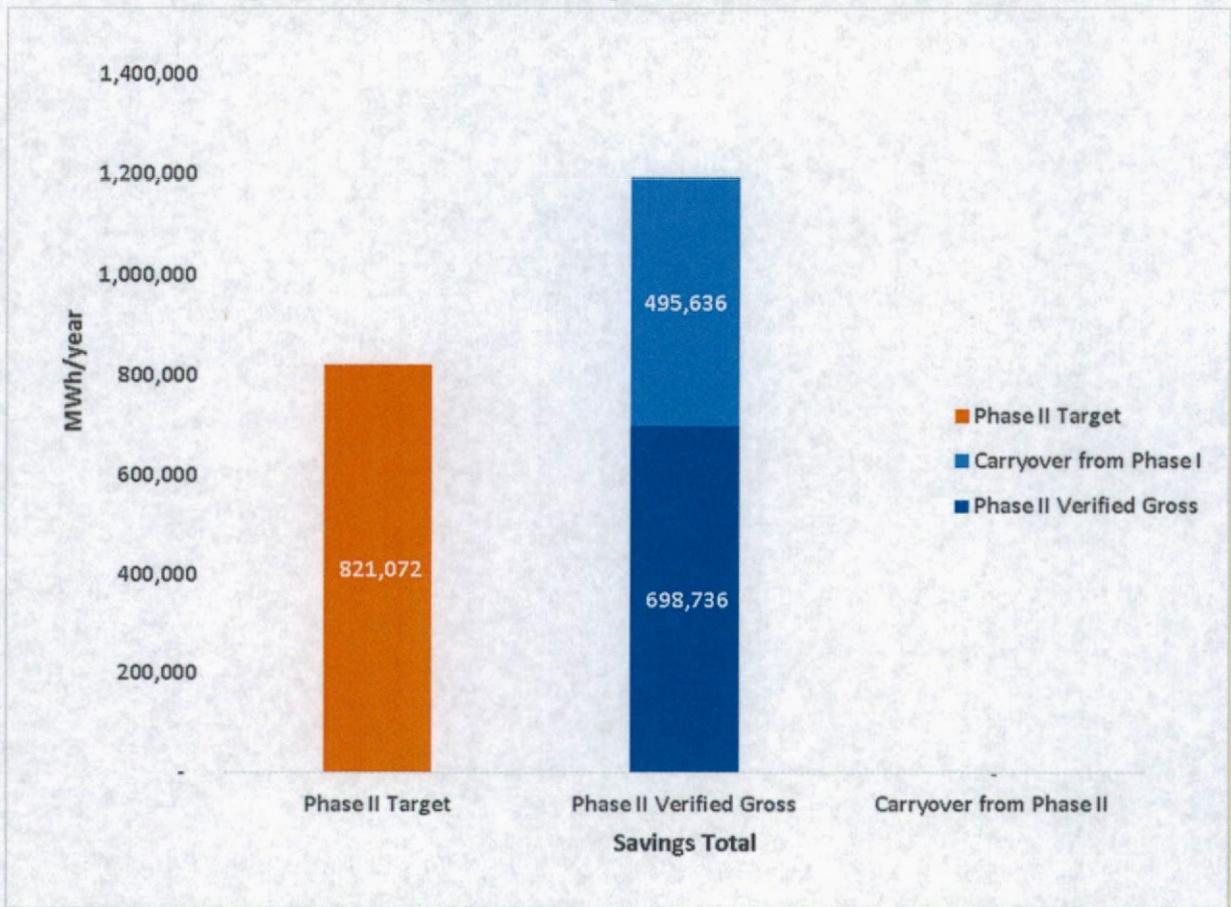
Phase III of Act 129 includes a demand response goal for PPL Electric Utilities. Demand response events are limited to the months of June through September, which are the first four months of the Act 129 program year. Because the demand response season is completed early in the program year, it is possible 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.

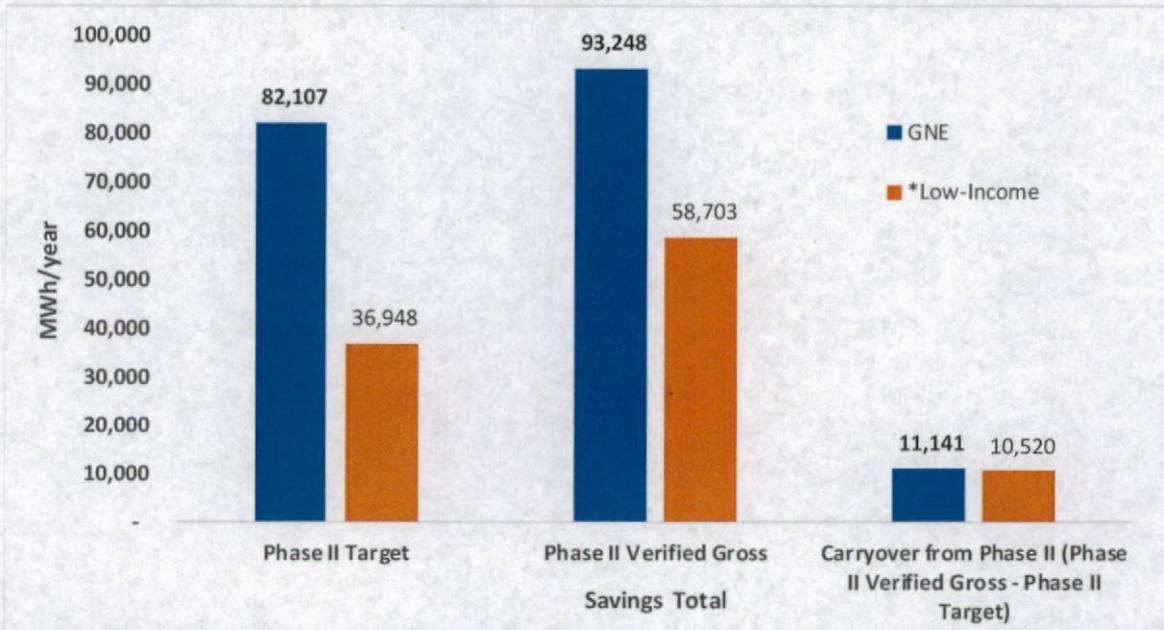
excess savings from the low-income customer segment.³ Table 2 shows the calculation of carryover savings for the low-income and GNE targets and Figure 2 illustrates these savings.

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:

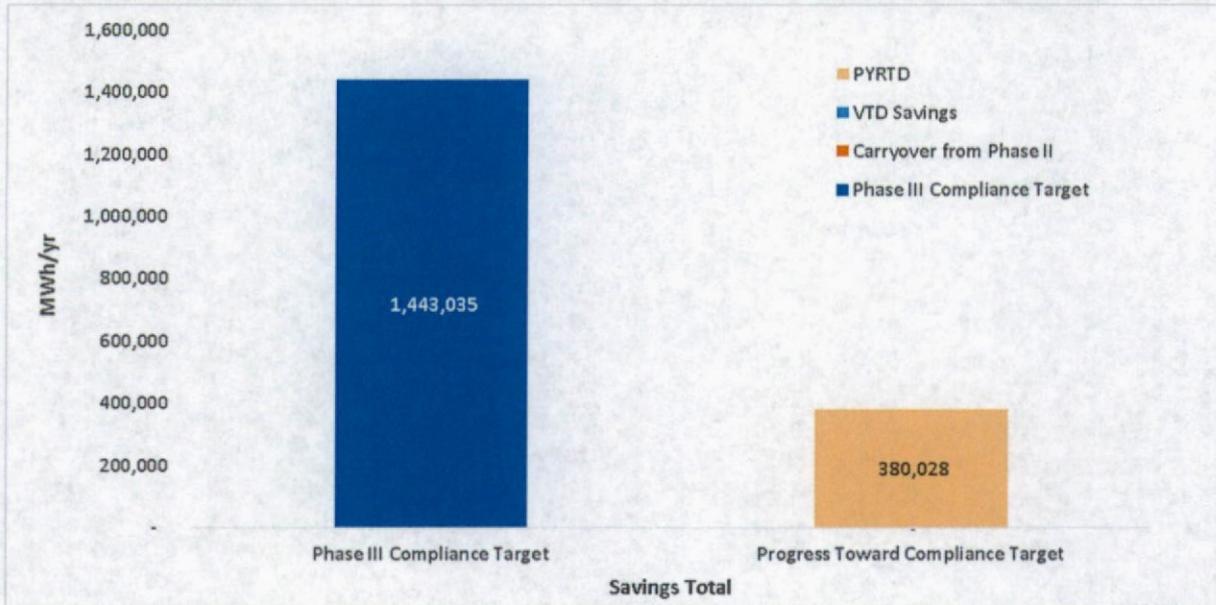
- 380,028 MWh/yr of reported gross electric energy savings (RTD)
- 100.81 MW/yr of reported gross peak demand savings (RTD) from energy efficiency programs
- 0 MW/yr of reported gross peak demand savings (RTD) from demand response programs because the program did not call events in PY8

- 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.

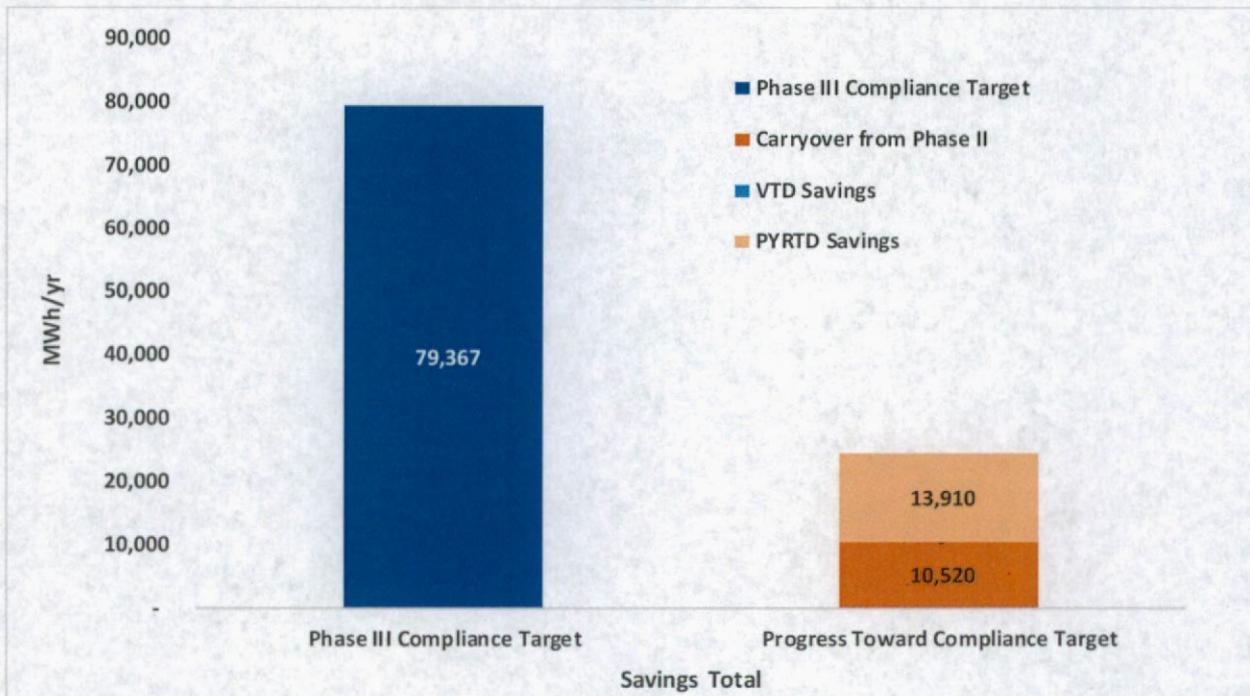
Figure 3: EE&C Plan Performance Toward Phase III Portfolio Compliance Target



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.

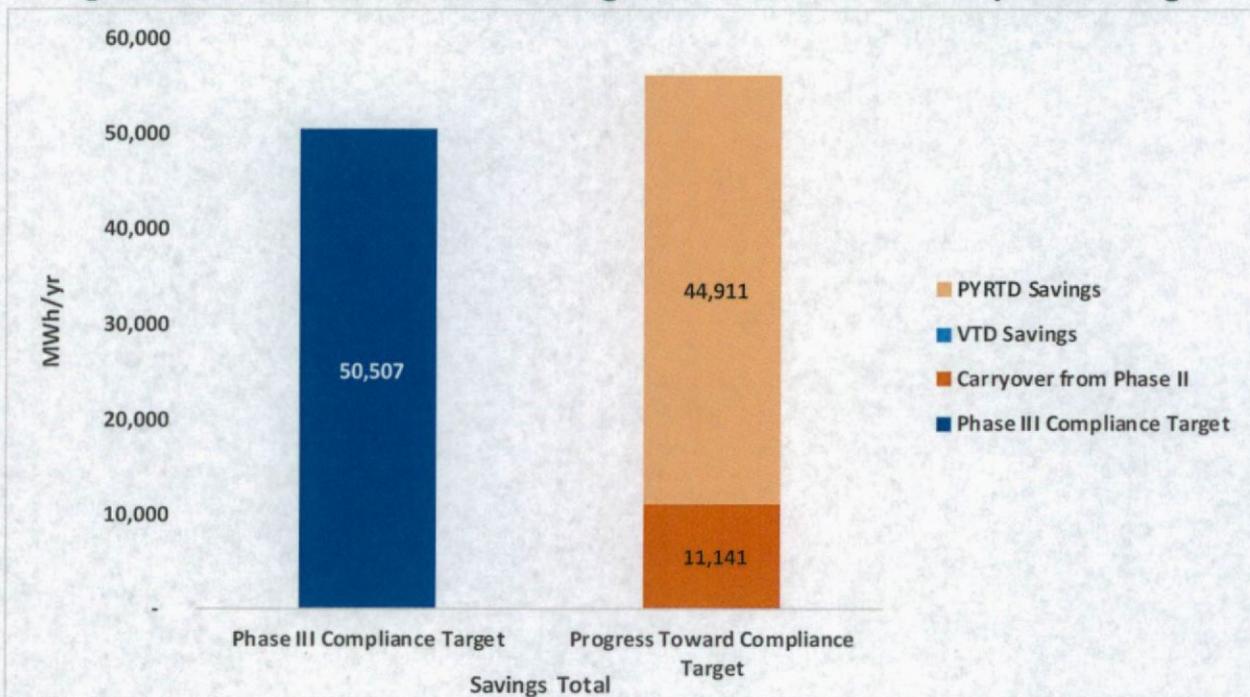
Figure 4: EE&C Plan Performance Toward Phase III Low-Income Compliance Target



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 | 542,556 | 14,835 | 22,336 | 183 | 548 | 580,458 |
| 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 | 542,556 | 14,835 | 22,336 | 183 | 548 | 580,458 |
| 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 account # | 184,257 | 184,257 |
| Low Income WRAP | Unique CSP job ID | 2,718 | 2,718 |
| Student Energy Efficient Education | Number of kits | 24,145 | 24,145 |
| Portfolio Total | | 580,458 | 580,458 |

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

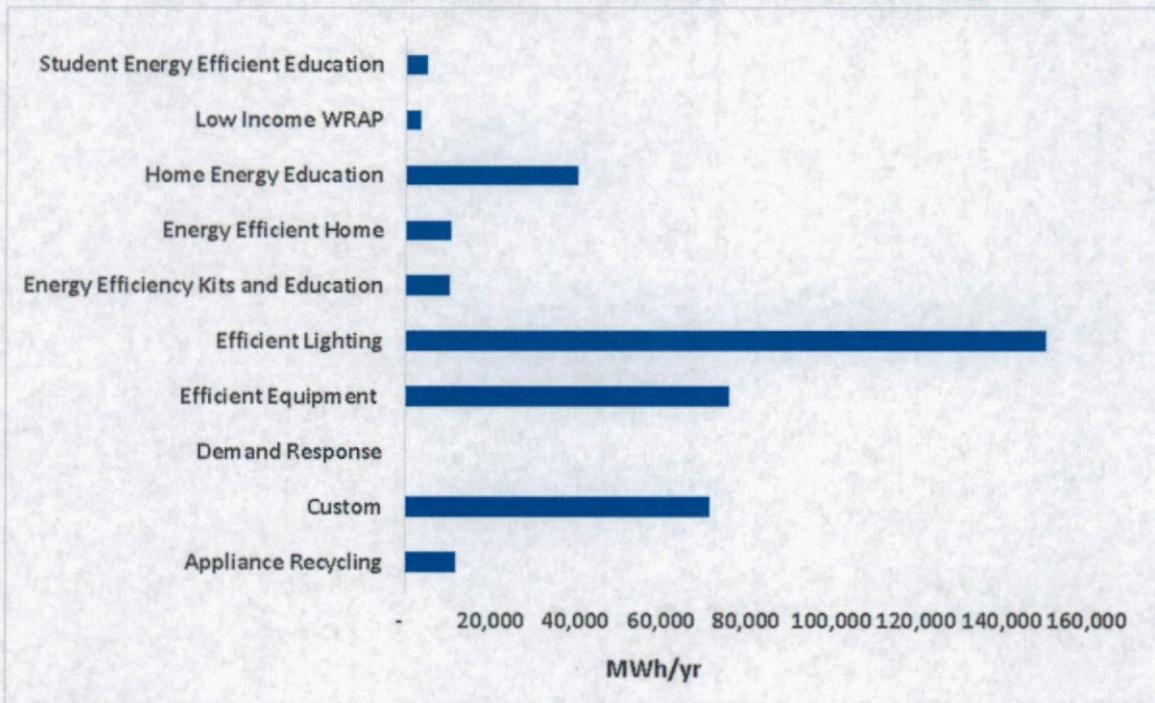
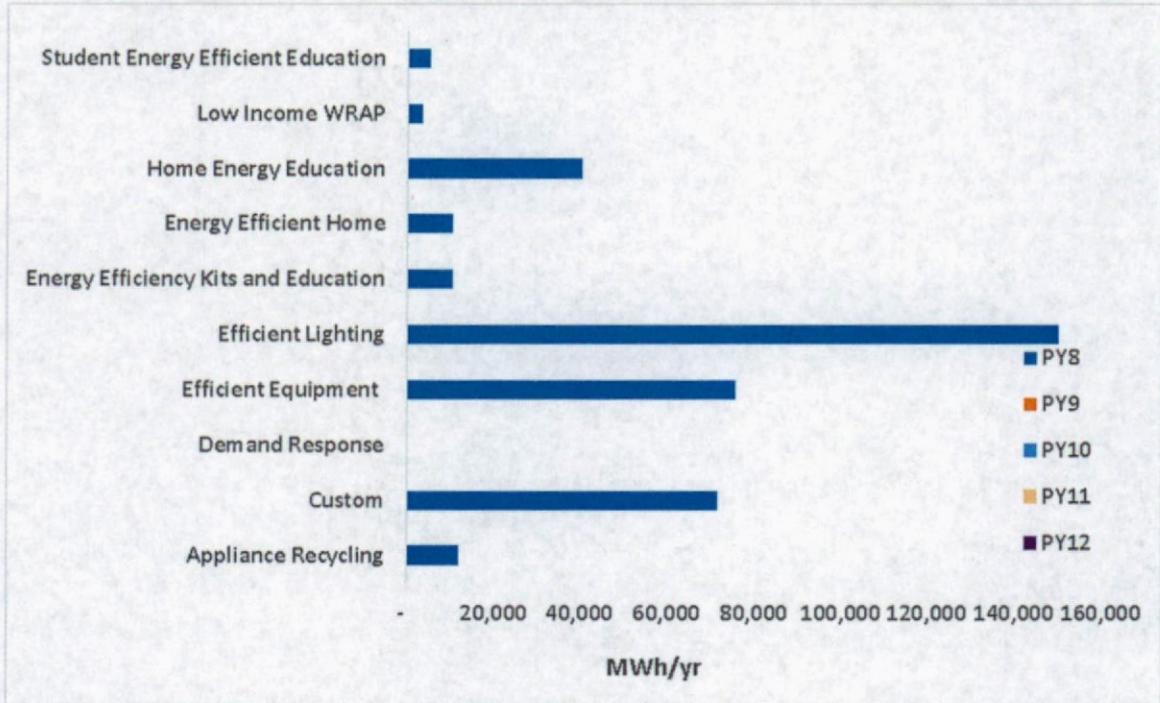


Figure 7 presents a summary of the PSA gross energy savings by program for Phase III of Act 129. PSA savings include verified gross savings from previous program years and the PYTD savings from the current program year.

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

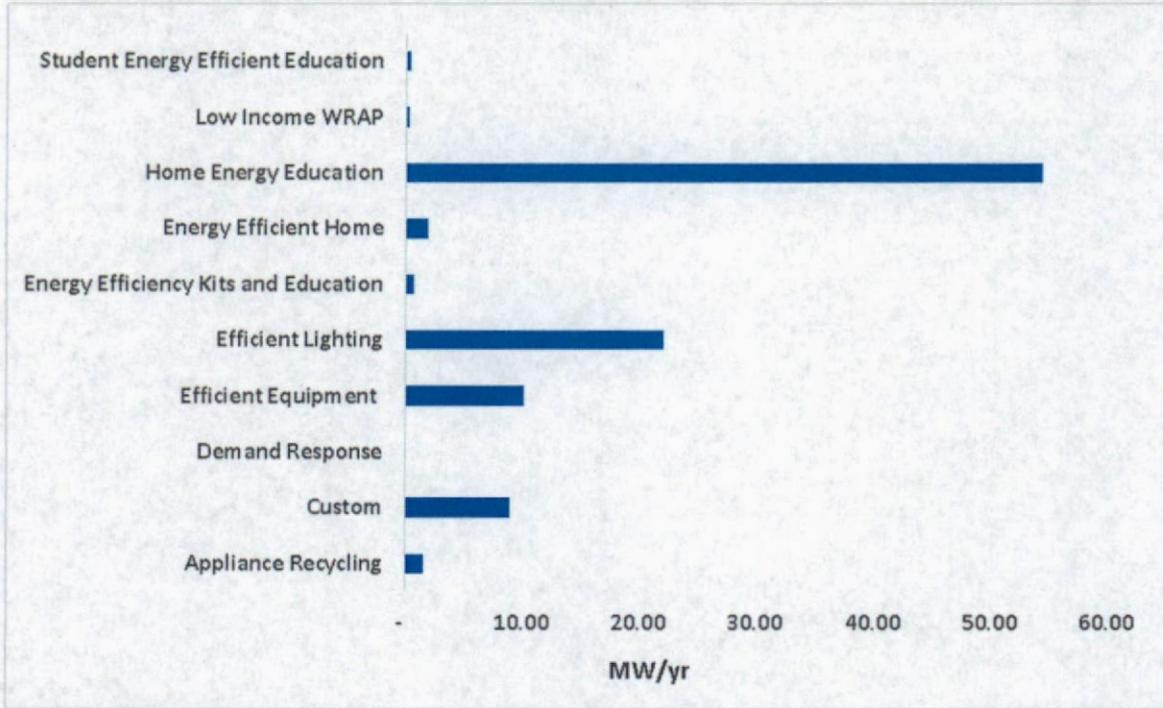
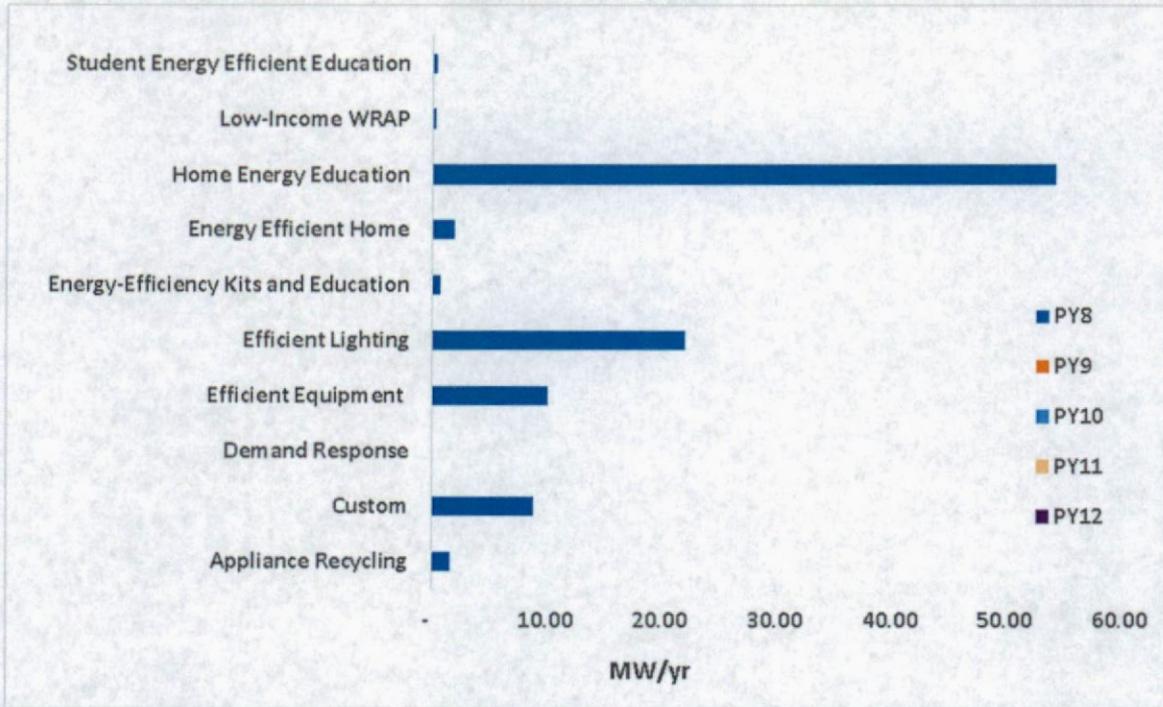


Figure 9 presents a summary of the PSA gross demand savings by energy efficiency program for Phase III of Act 129.

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 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 |

⁵ <http://www.puc.pa.gov/pdocs/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.



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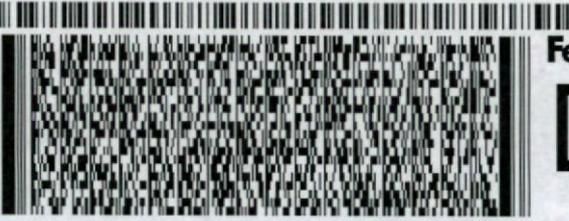
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