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Petition of PP&L          |
Electric Utilities        |
Corporation for Approval | Docket No.: M-2025-3057329
of its Act 129 Phase V   |
Energy Efficiency and    |
Conservation Plan        |
                          |
Call-In Telephonic       |
Evidentiary Hearing      |
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Judge's Chambers
 Commonwealth Keystone
 Building - Plaza Level
 400 North Street
 Harrisburg, PA

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Docket No. M-2025-3057329

Hearing Date: February 3, 2206

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Before the
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PPL Electric Utilities Corporation

Energy Efficiency and Conservation Plan

Act 129 Phase V

Docket No. M-2025-3057329

Filed December 1, 2025

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Acronyms and Abbreviations

Acronym	Definition
Act 129	Act 129 of 2008, P.L. 1592, 66 Pa. C.S. §§ 2806.1, 2806.2
ACR	Act 129 Compliance Rider
BOC	Builder Operator Certification
C&I	Commercial and industrial
CHP	Combined heat and power
Commission	Pennsylvania Public Utility Commission
CSP	Conservation service provider
CVR	Conservation Voltage Reduction
EDC	Electric distribution company
EE&C Plan	Act 129 Phase IV Energy Efficiency and Conservation Plan
EE&C Plan Template	EE&C Plan Template issued by the Commission on September 8, 2025, at Docket No. M-2025-3052826
EM&V	Evaluation, measurement, and verification
EUL	Effective useful life
EV	Electric Vehicle
FTE	Full-time employ
FTM	Front-of-the-meter
GNI	Government, nonprofit, and institutional
HEAR	Home Electrification and Appliance Rebates (HEAR)
HER	Home Efficiency Rebates (program)
Implementation Order	Pennsylvania Public Utility Commission's Final Implementation Order entered on June 18, 2025, at Docket No. M-2025-3052826
IRA	Inflation Reduction Act
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light Emitting Diode
LIURP	Low-Income Usage Reduction Program
MW	Megawatt
MWh	Megawatt-hour
MWh/year	MWh credited toward the compliance target in the year a measure is installed
OEM	Original Equipment Manufacturer
Pa PUC	Pennsylvania Public Utility Commission
Pa TRM	Pennsylvania Technical Reference Manual
Phase V Plan	Act 129 Phase V Energy Efficiency and Conservation Plan
PTR	Peak Time Rebates
PV	Photovoltaic
PY	Program year

Acronym	Definition
QA/QC	Quality assurance and quality control
RFP	Request for proposals
SEM	Strategic energy management
SWE	Statewide Evaluator
TOU	Time of use
UBC	Uniform Building Code
TRC	Total resource cost

1. Overview of PPL Electric Utilities’ Act 129 Phase V Plan

1.1. Summary Description of the Plan

PPL Electric Utilities Corporation (“PPL Electric Utilities” or the “Company”) hereby submits its Act 129 Phase V Energy Efficiency and Conservation Plan (“EE&C Plan,” “Plan,” or “Phase V Plan”) in compliance with Act 129 of 2008, P.L. 1592, 66 Pa. C.S. §§ 2806.1, 2806.2 (“Act 129”). This Plan is being filed pursuant to the Pennsylvania Public Utility Commission’s (“Pa PUC” or the “Commission”) Final Implementation Order entered on June 18, 2025, at Docket No. M-2025-3052826 (“Phase V Implementation Order”). The proposed portfolio comprises three programs, with the nine associated components listed in Table 1.

Table 1. PPL Electric Utilities’ Phase V Programs and Components

Program	Components	Incentive Tiers
Residential Energy Efficiency Program	▪ Energy Efficient Homes ▪ Appliance Recycling ▪ Student Education ▪ Persistent Peak Demand	▪ Standard ▪ Moderate Income
Business Energy Efficiency Program	▪ Small C&I Business Solutions ▪ Large C&I Business Solutions	▪ Standard
Resource Constrained Energy Efficiency Program (Low-Income)	▪ Energy Efficient Homes ▪ Appliance Recycling ▪ Student Education	▪ Low-Income

The portfolio of programs and components meets the goals set forth in the Phase V Implementation Order, including cost-effectively achieving all savings objectives within the required budget caps with a savings buffer to counteract any potential market uncertainty, federal changes to codes and standards, evaluation issues, and/or new program offerings to ensure the portfolio is successful. The Phase V forecast is shown in Table 2.

Table 2. Summary of Compliance Targets

Type	Target	EE&C Plan Forecast	
Overall Energy Reduction (MWh) ¹	828,231	1,066,059	
Overall Peak Demand Reductions (MW) ²	151.00	Coincident Peak Demand from Energy Efficiency Measures 167.60	Demand Response 12.99
Low-Income Energy Reductions (MWh)	65,678	75,623	
Budget Cap (excluding Statewide Evaluator [SWE] costs)	\$307,506,880	\$307,506,880	
Total Resource Cost Test	1.0	1.67	

¹ Energy savings (MWh) are on a gross-verified basis at the meter level.

² Peak demand savings (MW) are on a gross-verified basis at the system level.

1.1.1. Portfolio Objectives

The PPL Electric Utilities Phase V EE&C Plan is designed to meet the requirements set forth in the Phase V Implementation Order, which includes offering cost-effective programs for a five-year period beginning on June 1, 2026, and concluding May 31, 2031, which achieve all targets shown in Table 2. The Company's Plan complies with the 2% expenditure cap of 2006 annual revenues, also shown in Table 2, allocating costs to each benefiting customer class with a cost recovery tariff mechanism. The PPL Electric Utilities Phase V EE&C Plan offers comprehensive measures for all sectors and through all programs, while meeting the threshold of at least 50% of funds allocated to incentives at the portfolio level.

1.1.2. Overall Strategy to Achieve Compliance Targets

PPL Electric Utilities is prepared to meet our customers' needs and the targets set forth by the Commission by providing measures and an opportunity to participate for every customer in all parts of our territory. PPL Electric Utilities will supplement our already successful approach to program delivery and build on prior phase infrastructure, best practices, and high customer satisfaction. The Company will maintain effective strategic administration while partnering with highly qualified Conservation Service Providers ("CSPs") to implement the programs. Key new strategies to meet the Commission's compliance targets include removing barriers to participation, ensuring program equity, providing new services, allowing flexibility and innovation, and enhancing our supply chain engagement.

1.2. Plan Development Process, Key Assumptions, and Addressing Uncertainty

PPL Electric Utilities' EE&C Plan is designed around the Phase V Implementation Order requirements and adheres to other key supporting documentation, including the 2026 Pa Technical Reference Manual ("Pa TRM") and Final Total Resource Cost ("TRC") Test Order. In determining measure feasibility, the Company relied upon prior phase implementation data, the Pa PUCs Market Potential Study, as well as CSP input. In addition, the Company maintains an ongoing research and development cycle that allows program examples and best practices to be analyzed for the potential benefit of our customers. This

research also includes surveys of customers from all sectors, trade allies, and other market actors. All available information was synthesized into a cohesive Plan that is realistic, achievable, and meets all compliance requirements.

Act 129 energy efficiency programs are mature and have experienced success in driving changes in the market related to behavior, equipment, and product purchases, as well as updated efficiency standards. Compounding the challenges brought through the change in the market are higher upfront costs for comprehensive measures, fewer low-cost, high-impact measures, and diminishing returns for some measures. There are also uncertainties at the federal level with changes in structure, priorities, and funding. The implementation environment for Phase V will be difficult. Regardless of these headwinds, the Company has a well-developed strategy to ensure Phase V success.

1.2.1. Principles Guiding Development of the Plan

PPL Electric Utilities' prior and future success is dependent on multiple core principles of energy efficiency program design, including the following:

- **Focus on Customer Satisfaction** – Ensure the highest levels of customer satisfaction possible for all programs through meaningful program offerings, education, a dedicated community outreach team, and services that empower customers to understand and control their energy usage.
- **Programs Designed for Customers** – All existing Phase IV programs were evaluated for inclusion in Phase V, and this evaluation was supplemented with extensive research on potential new programs. The resulting portfolio maintains cost-effective, popular existing options with enhancements for every sector to meet the challenges of the next five years.
- **A Path for All Customers** – PPL Electric Utilities will continue to partner with CSPs to deliver multiple avenues for participation, including simple online and traditional rebate processing, instant discounts, and a variety of flexible scheduling options for all services, and easy-to-understand resources to guide customers through their journey.
- **Seamless Administration** – PPL Electric Utilities has sophisticated and effective processes and systems, research functions, skilled professionals with extensive experience in designing and implementing energy efficiency programs, and robust relationships with both internal and external stakeholders. This will allow the Company to accurately track and report on data, support CSPs and trade allies, and maintain flexibility to improve the programs over time.
- **CSP Partnerships** – The Company will also utilize only three contracts for program implementation, though CSPs were able to bid on more than one contract. This will create additional opportunities for cross-program functions, such as call centers and customer-facing web tools, as well as a more cohesive customer experience. Performance-based contracts will again be leveraged to lower administrative costs and ensure program success.
- **Overarching Marketing Support** – PPL Electric Utilities will provide oversight of all customer engagement to ensure consistent branding, clear messaging, effective cross-portfolio

promotion, and adherence to the EE&C Plan. This will increase new participation and encourage existing participants to take advantage of other areas of the portfolio.

- **Engaging Stakeholders** – PPL Electric Utilities held several direct meetings with key stakeholders during the development of the EE&C Plan to acquire feedback on stakeholder priorities for evaluation of inclusion in the Plan. The Company will continue to communicate portfolio performance through annual reporting, as well as twice-annual stakeholder meetings. These meetings will provide key information and program updates, allowing for meaningful stakeholder input.

These fundamental program elements are woven into all aspects of the Company’s EE&C Plan and are supported by additional key strategies to ensure success during Phase V, including these:

- **Remove Barriers to Participation** – The Company will create a moderate-income tier within the Residential Energy Efficiency Program to provide higher incentives based on financial need and offer third-party financing through the selected CSPs for both moderate income residential and commercial and industrial (“C&I”) customers.
- **Ensure Program Equity** – Income-eligible customers eligible for the Resource Constrained Energy Efficiency Program will be offered a similar customer journey and measure offerings as in the Residential Energy Efficiency Program, though at no cost. PPL Electric Utilities also plans to require the CSPs and subcontractors delivering both the Residential and Resource Constrained Energy Efficiency Programs to be highly integrated adding to the existing partnerships with the Low-Income Usage Reduction Program (“LIURP”) and other assistance programs.
- **Business Support Services** – The Company will provide early engineering assistance, training and certification incentives, technical feasibility studies, and strategic energy management to engage business customers at critical steps in their project life cycles to ensure energy efficiency integration.
- **New Measure Innovation** – PPL Electric Utilities will work closely with the selected evaluation, measurement, and verification (“EM&V”) CSP, the Statewide Evaluator (“SWE”), and market actors to analyze potential new measures or approaches for inclusion in Phase V via interim measure protocol, custom measure, or pilot, where appropriate.
- **Customer-friendly Demand Response** – The Company has proposed an array of demand response offerings that consider budget limitations and maximize customer benefit while minimizing customer inconvenience.
- **Enhanced Supply Chain Engagement** – Create support structures for manufacturers, distributors, and trade allies to increase the quality of measure installation and increase adoption of energy efficiency practices. This may include new networks offering training, additional incentives for project completion, quality assurance, and control advisement.

1.2.2. Developing the Portfolio

PPL Electric Utilities developed the portfolio as a multiyear, comprehensive, and collaborative undertaking. The Company utilized a data science approach, leveraging vast existing program data elements, to determine preliminary sector budgets. The budgets, cost estimates, and myriad participation data were used to create an initial portfolio model that was compared to the information available within the SWE's Phase V studies and supporting documentation. Through the RFP process, CSPs were invited to submit program and/or portfolio builds as part of their submissions that outlined how each CSP intended to meet verified gross energy savings and coincident peak demand targets within the available budget for direct program costs, while ensuring total portfolio cost-effectiveness. The CSP submissions were compared to the Company's baseline portfolio model for alignment, and their portfolio approach was analyzed to ensure it met PPL Electric Utilities' stated core and new strategies and guiding principles. Other requirements for the CSPs include a customer satisfaction target where at least 85% of customers rate themselves as satisfied or very satisfied and capture at least 15% of the total cumulative savings each program year. All CSP assumptions, estimates, and forecasts were required to have supporting documentation or references to ensure feasibility.

1.3. Summary Tables of Portfolio Savings, Goals, Budgets, and Cost-Effectiveness

Table 3 (Pa PUC Table 1) through Table 6 (Pa PUC Table 4) in this section summarize the estimated savings, budget, and cost-effectiveness for PPL Electric Utilities' entire portfolio. The tables are numbered sequentially, with the formats matching those provided in the EE&C plan template issued by the Commission on September 8, 2025, at Docket No. M-2025-3052826. Each table caption includes a reference to the corresponding table number provided in the EE&C plan template.

Table 3. Pa PUC Table 1 - Portfolio Summary of Lifetime Costs and Benefits of EE&C Plan

Sector	Total Discounted Lifetime Costs (\$000) ¹	Total Discounted Lifetime Benefits (\$000)	Total Discounted Net Lifetime Benefits (\$000) ²	Cost-Benefit Ratio (TRC)
Market Rate Residential (exclusive of Low-Income) ³	\$124,095	\$156,458	\$32,364	1.26
Residential Low-Income	\$51,075	\$107,547	\$56,472	2.11
Small Commercial & Industrial	\$431,459	\$711,778	\$280,319	1.65
Large Commercial & Industrial	\$239,514	\$441,497	\$201,983	1.84
Total Portfolio⁴	\$846,143	\$1,417,280	\$571,137	1.67

Note: TRC is the Total Resource Cost test

¹ Discounted common costs are included proportionately to direct costs in the sector totals.

² "Net" refers to the arithmetic difference between the previous two columns. It does not refer to net verified savings.

³ The Phase V Implementation Order disallowed the inclusion of low-income participation in standard, non-low-income-specific residential programs in the calculation of savings towards the low-income carve-out.

⁴ Total values may not equal the sum of all sector values due to rounding.

The PPL Electric Utilities Phase V EE&C Plan follows the Act 129 energy accounting framework, whereby savings targets and reported savings are stated as incremental annual gross savings.

Gross savings are the changes in energy consumption and/or peak demand that result directly from program-related actions taken by participants in an EE&C program, regardless of why they participated. Incremental annual savings are the annualized savings delivered by a measure in the first year. Savings estimates are assumed to be weather-normalized using 15-year weather normals (2006 through 2020), in line with the 2026 Pa TRM.

Although the effective useful life (EUL) of a measure is not factored into savings targets, it is considered in the TRC test; measures with longer EULs have higher lifetime savings and will generate more lifetime TRC benefits.

Table 4 presents a summary of PPL Electric Utilities' Phase V EE&C Plan energy savings in the first year and overall lifetime savings. Energy savings targets and reporting are shown at the meter level, the amount of energy saved at the customer premises, in accordance with the Phase V Final Implementation Order.

Table 4. Pa PUC Table 2 - Summary of Portfolio Energy Savings

MWh Saved for Consumption Reductions (Meter-Level)	PY18		PY19		PY20		PY21		PY22		Total	
	1st-Year MWh ⁴	Lifetime MWh	1st-Year MWh	Lifetime MWh	1st-Year MWh	Lifetime MWh	1st-Year MWh	Lifetime MWh	1st-Year MWh	Lifetime MWh	1st-Year MWh	Lifetime MWh
Baseline ¹	38,214,368		38,214,368		38,214,368		38,214,368		38,214,368		38,214,368	
Market Rate Residential Sector (<i>exclusive of Low-Income</i>) – Projected Incremental Savings	41,900	305,337	41,035	307,269	39,791	302,232	24,093	252,849	23,126	242,064	169,945	1,409,751
Residential Low-Income Sub-Sector – Projected Incremental Savings	17,738	175,456	15,875	155,293	16,125	157,077	14,532	138,640	11,353	103,932	75,623	730,399
Small C&I Sector – Projected Incremental Savings	96,973	1,367,425	116,828	1,669,913	112,555	1,601,578	97,660	1,397,551	75,341	1,076,722	499,356	7,113,189
Large C&I Sector – Projected Incremental Savings	50,422	748,798	65,955	978,115	74,729	1,109,200	72,806	1,077,724	57,223	848,203	321,135	4,762,041
EE&C Plan Total – Projected Incremental Savings	207,033	2,597,016	239,692	3,110,590	243,200	3,170,086	209,091	2,866,765	167,043	2,270,920	1,066,059	14,015,378
EE&C Plan Total – Projected Cumulative Savings	207,033	2,597,016	446,726	5,707,607	689,925	8,877,693	899,016	11,744,458	1,066,059	14,015,378	1,066,059	14,015,378
EE&C Plan Total – Percentage of Target to be Met ²	25%		54%		83%		109%		129%		129%	
Estimated Phase IV Carryover Savings											0	
Total Cumulative Projected Savings Phase V + Estimated Phase IV Carryover Savings ³	207,033		446,726		689,925		899,016		1,066,059		1,066,059	
Cumulative Percent Reduction from Baseline	1%		1%		2%		2%		3%		3%	
Commission-Identified Goal											828,231	

¹ As defined in the June 18, 2025, Implementation Order.

² The June 18, 2025, Implementation Order directed that electric distribution companies (EDCs) achieve at least 15% of the target amount in each program year.

³ Total values may not equal the sum of all program year or sector values due to rounding.

Table 5 and Table 6 show portfolio demand savings by year and program type. Table 5 provides planned annual peak demand savings, while Table 6 breaks out winter and summer demand savings. Phase V of Act 129 includes both summer and winter peak demand periods. The summer definition includes an evening period only, while the winter definition includes a morning and evening period. PPL Electric Utilities has elected to update the peak values to align with the Company's specific and identified peak periods. These peak times were obtained from system wide load data from peak summer and winter months. It should be noted that the Company's peak period extends through September in the Summer and from December in the Winter though will follow the months set forth by the Pa PUC:

- **Summer Peak Demand Definition:** non-holiday weekdays June – August, from 4:00 pm to 7:00 pm Eastern Prevailing Time
- **Winter Peak Demand Definition:** non-holiday weekdays, January – February, from 6:00 am to 9:00 am and 6:00 pm to 8:00 pm Eastern Prevailing Time

Annual peak demand savings are the average of summer and winter peak demand savings.

Both coincident demand reductions from energy efficiency programs and demand reductions from demand response programs contribute to peak demand savings, though the accounting for demand reductions from the two program types differs. Energy efficiency programs sum the first-year demand savings from measures within each program year and then sum the incremental savings across the portfolio period. Demand reductions from demand response programs are averaged across the five years of the portfolio. The total portfolio demand reduction is determined by summing the energy efficiency demand savings and the average of the demand response demand savings.

Peak demand targets and reporting are at the system level. The demand savings in Table 5 and Table 6 are scaled up by the PPL Electric Utilities-specific line loss values provided in the 2026 TRM.

Table 5. Pa PUC Table 3 - Summary of Portfolio Demand Savings

System-Level MW Savings (Average of Summer and Winter)	PY18	PY19	PY20	PY21	PY22	Total
	1st- Year MW	1st- Year MW	1st- Year MW	1st- Year MW	1st- Year MW	1st- Year MW
Baseline¹	6,592	6,592	6,592	6,592	6,592	6,592
Market Rate Residential Sector (exclusive of Low-Income) – Projected Incremental Annual Savings	6.04	5.92	5.76	3.78	3.65	25.14
Residential Low-Income Sub-Sector – Projected Incremental Annual Savings	2.51	2.28	2.31	2.12	1.74	10.95
Small C&I Sector – Projected Incremental Annual Savings	15.69	18.73	18.19	15.69	12.04	80.33
Large C&I Sector – Projected Incremental Annual Savings	8.15	10.49	12.11	11.39	9.03	51.17
Coincident Demand Reduction from Energy Efficiency Subtotal	32.38	37.41	38.37	32.97	26.47	167.60
Residential Load Shifting - Projected MW Savings	9.00	9.00	9.00	9.00	9.00	9.00
Small C&I Sector Load Shifting – Projected MW Savings	0.00	4.08	6.12	0.00	0.00	2.04
Large C&I Sector Load Shifting – Projected MW Savings	0.00	0.00	3.91	5.86	0.00	1.95
Daily Load Shifting Subtotal	9.00	13.08	19.02	14.86	9.00	12.99
Cumulative Projected Compliance Savings²	34.18	74.21	116.38	152.32	180.59	180.59
Cumulative EE&C Plan Total – Percentage of Target to be Met³	23%	49%	77%	101%	120%	120%
Estimated Phase IV Carryover Savings⁴						0
Total Cumulative Projected Savings Phase V + Estimated Phase IV Carryover Savings⁵	34.18	74.21	116.38	152.32	180.59	180.59
Cumulative Percent Reduction from Baseline	0.52%	1.13%	1.77%	2.31%	2.74%	2.74%
Commission-Identified Goals¹						151.00

¹ As defined in the Phase V Implementation Order.

² Cumulative totals reflect one-fifth of the expected MW savings from load shifting programs due to the average performance accounting method. Energy efficiency program savings are additive across program years, while Load Shifting programs average across the Phase.

³ The Phase V Implementation Order directed that EDCs achieve at least 15% of the target amount in each program year.

⁴ 50% of any excess Phase IV demand reduction can be claimed as carryover.

⁵ Total values may not equal the sum of all program year or sector values due to rounding.

Table 6 shows summer (Sum) and winter (Win) MW savings by Plan year.

Table 6. Pa PUC Table 4 - Summary of Seasonal Demand Savings

Component MW Savings (System-Level)	PY18		PY19		PY20		PY21		PY22		Total	
	Sum MW	Win MW	Sum MW	Win MW	Sum MW	Win MW	Sum MW	Win MW	Sum MW	Win MW	Sum MW	Win MW
Coincident Reduction from EE - Residential	9.25	7.84	8.94	7.45	8.84	7.29	6.64	5.14	6.21	4.57	39.89	32.30
Coincident Reduction from EE - Non-Residential	30.36	17.31	36.19	22.24	38.10	22.51	32.36	21.78	24.33	17.82	161.34	101.67
Daily Load Shifting - Residential ¹	5.92	12.07	5.92	12.07	5.92	12.07	5.92	12.07	5.92	12.07	5.92	12.07
Daily Load Shifting - Non-Residential	0.00	0.00	4.08	4.08	10.02	10.02	5.86	5.86	0.00	0.00	3.99	3.99
Total²											211.14	150.03
Phase V Peak Demand Reduction Target											151.00	
Percentage of Goal in Season ³											140%	99%

¹ Daily load-shifting savings average across the phase, energy efficiency sums across the phase.

² Total values may not equal the sum of all program year or program type values due to rounding.

³ The Phase V Implementation Order directed that EDCs achieve at least 75% of the target amount in each season.

1.4. Summary of Program Implementation Schedule

Table 7 summarizes PPL Electric Utilities' implementation schedule. The Company expects all programs and components to be available to customers at the start of Phase V.

Table 7. PPL Electric Utilities Implementation Schedule

Program Year (PY)	Start Date	End Date
PY18	6/1/2026	5/31/2027
PY19	6/1/2027	5/31/2028
PY20	6/1/2028	5/31/2029
PY21	6/1/2029	5/31/2030
PY22	6/1/2030	5/31/2031

1.5. Strategy to Acquire 15% of Consumption Reduction and Coincident Peak Demand Reduction Target for Each Program Year

PPL Electric Utilities will monitor program and channel performance and, if necessary, adjust marketing and communications, incentive levels, eligibility requirements, sector and program budgets, and/or measure offerings to manage participation as necessary to achieve at least 15% of its portfolio target annually.

1.6. Strategy to Acquire 75% of Peak Demand in Each Season

PPL Electric Utilities has worked closely with the selected CSPs to develop a selection of measures that offer benefits in both seasons, as per the recommendation by the Pa PUC. In addition, our demand response activities will be available across seasons, further supporting the Company's plan to acquire 75% of the proposed peak demand target in each season. The forecasted values across each season can be found in Table 6.

No alternative performance windows for daily load shifting will be recommended by PPL Electric Utilities at the start of Phase V. If the Company determines that a different performance window is required based on performance results, the Company will provide rationale to the SWE, including required documentation, and update evaluation plans, as is necessary.

1.7. Strategy to Manage EE&C Portfolio and Engage Customers and Trade Allies

PPL Electric Utilities will maintain overall general administration, strategic oversight, and overarching marketing of the EE&C portfolio. The Company plans to use CSPs to implement the programs—one CSP with subcontractors will manage the Residential, Resource Constrained, and the Business Energy Efficiency Programs. The CSPs will deliver the programs while also providing program-specific marketing, customer care functions, application and rebate processing, and creation and maintenance of trade ally networks. All customer communications will be consistent across programs and align with the Company's brand and messaging guidelines to ensure a cohesive approach.

In addition to a robust marketing effort, PPL Electric Utilities and its CSPs will work closely with trade allies, community-based organizations, and an array of local, state, and national market actors to create program awareness and continue effective market transformation. The Company may provide incentives to trade allies, distributors, or other market actors to engage the market and ensure program success.

The Company and CSP partnership will be supported by robust internal and independent EM&V to evaluate customer satisfaction and engagement, as well as program effectiveness, which will allow PPL Electric Utilities to modify programs, measures, eligibility, application process and administrative requirements, incentive levels and/or tiers, or other aspects of the programs and/or components to improve program performance and/or customer satisfaction, as needed.

These customer and trade ally engagement strategies may be further bolstered by other offerings, including PPL Electric Utilities' Energy Analyzer, education, training, or any other tools and resources deemed necessary by the Company.

1.8. Data Management, Quality Assurance, and Evaluation Process

1.8.1. Data Management

PPL Electric Utilities' CSPs will provide program implementation data for its central tracking database, which will allow for management of the portfolio and required reporting. If external programs are available during Phase V, the Company will adhere to guidance as per the Pa PUC and comply with agreed-upon data sharing requirements established by the Pa PUC's data sharing working group, provided they meet the Company's data and cybersecurity policies.

1.8.2. Quality Assurance and Quality Control

The Company will design programs and components with quality assurance best practices to prevent issues or errors during implementation. PPL Electric Utilities and its CSPs will employ eligibility screening tools, digital data collection procedures, and leverage CSP field employees to perform virtual, remote (phone), or on-site inspections for a portion of participants to confirm proper measure installation. These activities will allow the Company to maintain data integrity, allow for accurate measurement and verification, and ensure resources are always properly allocated. The Company will ensure that CSPs have applicable training and skills to perform implementation tasks and have a well-defined scope of work and resources required for each activity or project. A detailed description of PPL Electric Utilities' quality assurance and quality control ("QA/QC") protocols and standards is provided in Section 6.

1.8.3. Evaluation Process

The Company's EM&V CSP will develop an evaluation plan, approved by the SWE, which describes the EM&V scope of work, objectives, methods, and activities for evaluating program impacts, processes, cost-effectiveness, and net savings analysis. This evaluation plan may be updated based on program

changes, program metrics, codes or standards updates, and Pa TRM updates or changes to the Evaluation Framework.

PPL Electric Utilities' EM&V CSP will conduct annual evaluations of each program in compliance with all Pa PUC requirements, Pa TRM, and the Evaluation Framework. An impact evaluation will determine verified savings and confirm that all data required for the impact evaluation are available. A separate process evaluation will focus on the qualitative elements of the programs' design and implementation. During the annual evaluation, the EM&V CSP will also determine cost-effectiveness for the programs and portfolio using the TRC test, as well as a net verified savings analysis of each program. The net savings include the effects of free ridership and spillover.

1.9. Cost Recovery Mechanism

Act 129 requires that each EDC establish a reconcilable cost recovery tariff mechanism in accordance with 66 Pa. C.S. § 1307 and to include this mechanism in its EE&C Plan (66 Pa. C.S. § 2806.1(b)(1)(i)(H), (k)(1)). Details on the cost recovery mechanism can be found in Section 7.

2. Energy Efficiency Portfolio and Program Summary Tables and Charts

Table 8 (Pa PUC Table 5), Table 9 (Pa PUC Table 6), and Table 10 (Pa PUC Table 7) provide an overview of the Phase V Plan. The tables are numbered sequentially, with the formats matching those provided in the EE&C plan template issued by the Commission on September 8, 2025, at Docket No. M-2025-3052826. Each table caption includes a reference to the corresponding table number provided in the EE&C plan template. Summaries of portfolio lifetime costs and benefits, and energy and demand savings are provided in Table 3 (Pa PUC Table 1), Table 4 (Pa PUC Table 2), Table 5 (Pa PUC Table 3), and Table 6 (Pa PUC Table 4) within Section 1.3.

Table 8. Pa PUC Table 5 – Summary of Portfolio Costs¹

Sector	PY18		PY19		PY20		PY21		PY22		Phase V	
	\$000	%	\$000	%	\$000	%	\$000	%	\$000	%	\$000	%
Residential Market Rate	\$12,928	22%	\$13,290	21%	\$13,571	21%	\$12,963	21%	\$13,215	24%	\$65,967	21.5%
Residential Low-Income	\$10,952	18%	\$10,267	16%	\$10,235	16%	\$9,580	15%	\$8,318	15%	\$49,352	16.0%
Small C&I	\$17,718	30%	\$20,507	32%	\$20,176	31%	\$18,092	29%	\$14,997	27%	\$91,489	29.8%
Large C&I	\$9,796	16%	\$12,028	19%	\$13,423	20%	\$12,856	21%	\$10,495	19%	\$58,598	19.1%
Common Costs	\$8,420	14%	\$8, 420	13%	\$8, 420	13%	\$8, 420	14%	\$8, 420	15%	\$42,100	13.7%
Total Portfolio Budget ²	\$59,547	100%	\$64,991	100%	\$66,511	100%	\$61,975	100%	\$54,483	100%	\$307,507	100%
SWE Cost	\$1,000		\$1,000		\$1,000		\$1,000		\$1,000		\$5,000	

¹ Values in this table are nominal.
² Total values may not equal the sum of all program year or sector values due to rounding.

Table 9. Pa PUC Table 6 – Program Summaries

Sector	Program	Component Name	Program Market	Program Two-Sentence Summary	Program Years Operated	Compliance MWh-year	Lifetime MWh Savings	Compliance MW-year	Percentage of Portfolio Resource Savings (MWh% and MW%)	
Market Rate Residential Programs <i>(exclusive of Low-Income)</i>	Residential Energy Efficiency Program	Energy Efficient Homes	Existing and new residential single family and multifamily homes, though available to small and medium-sized businesses if applicable	Offers rebates and instant discounts on a wide range of energy-efficient measures for retrofit and new construction applications, and Home Energy Reports for all residential.	PY18 - PY22	139,890	1,256,417	19.31	13%	11%
		Appliance Recycling	All customers (primarily residential)	Free pick up and recycling of inefficient appliances including refrigerators, freezers, and room air conditioners. Incentive paid for each eligible appliance.	PY18 - PY22	24,880	107,867	4.91	2%	3%
		Student Education	Residential customers: students and teachers	Energy efficiency education targeting primary and secondary grades, including classroom presentations, curriculum, and energy efficiency kits.	PY18 - PY22	3,950	27,290	0.65	0%	0%
		Persistent Peak Demand	Residential single and multifamily	Includes incentivized and non-incentivized demand response channels such as thermostat optimization, managed electric vehicle charging, and battery storage demand response.	PY18-PY22	0	0	9.00	0%	5%
	Business Energy Efficiency Program	Small C&I Business Solutions	Residential customers with business end use such as agricultural use/farms	Offers rebates and incentives on energy efficient farm equipment and upgrades to farms on residential accounts.	PY18 - PY22	1,224	18,177	0.27	0%	0%
	Totals for Residential Sector					169,945	1,409,751	34.14	16%	19%

Sector	Program	Component Name	Program Market	Program Two-Sentence Summary	Program Years Operated	Compliance MWh-year	Lifetime MWh Savings	Compliance MW-year	Percentage of Portfolio Resource Savings (MWh% and MW%)	
Residential Low-Income Programs	Resource Constrained Program	Energy Efficient Homes	Income-qualified residential customers	Offers a range of free direct install energy efficiency measures, energy assessments, and health and safety measures to customers whose incomes are at or below 150% of federal poverty income guidelines.	PY18 - PY22	62,583	654,943	8.58	6%	5%
		Appliance Recycling	Income-qualified residential customers	Offers free pick up and recycling of inefficient appliances, including refrigerators, freezers, and room air conditioners for income-eligible customers. Incentive paid for each eligible appliance.	PY18-PY22	5,410	23,069	1.12	1%	1%
		Student Education	Income-qualified residential customers	Offers energy efficiency education targeting income-eligible primary and secondary grades, including classroom presentations, curriculum, and energy efficiency kits.	PY18-PY22	7,629	52,387	1.26	1%	1%
	Totals for Low-Income Sector					75,623	730,399	10.95	7%	6%
Small C&I Programs	Business Energy Efficiency Program	Small C&I Business Solutions	Small C&I	Provides rebates/incentives for a list of qualified energy efficiency and custom measures not included in PPL Electric Utilities' other programs. Includes equipment, process upgrades, engineering support, and other measures.	PY18 - PY22	497,390	7,105,706	82.08	47%	45%
	Residential Energy Efficiency Program	Energy Efficient Homes	Small C&I	Offers Energy Analyzer for all small and medium-sized business customers.	PY18 - PY22	0	0	0.00	0%	0%
		Appliance Recycling	Small C&I	Offers free pick up and recycling of inefficient appliances for eligible C&I customers.	PY18-PY22	1,582	7,099	0.29	0%	0%
	Resource Constrained Program	Energy Efficient Homes	C&I owners of multifamily buildings with income-eligible tenants	Offers no cost efficiency improvements to multifamily building owners.	PY18 - PY22	384	384	0.00	0%	0%
	Totals for Small C&I Sector					499,356	7,113,189	82.37	47%	46%

Sector	Program	Component Name	Program Market	Program Two-Sentence Summary	Program Years Operated	Compliance MWh-year	Lifetime MWh Savings	Compliance MW-year	Percentage of Portfolio Resource Savings (MWh% and MW%)	
Large C&I Programs	Business Energy Efficiency Program	Large C&I Business Solutions	Large C&I	Provides rebates/incentives for a list of qualified energy efficiency and custom measures not included in PPL Electric Utilities' other programs. Includes equipment, process upgrades, engineering support, and other measures.	PY18 - PY22	321,135	4,762,041	53.12	30%	29%
	Totals for Large C&I Sector					321,135	4,762,041	53.12	30%	29%
Totals for Plan ¹						1,066,059	14,015,378	180.59	100%	100%

¹ Total values may not equal the sum of all sector or program values due to rounding.

Table 10 shows PPL Electric Utilities’ Phase V portfolio budget by sector, as a percentage of the total portfolio budget and as a percentage of PPL Electric Utilities’ 2024 revenue and sales.

Table 10. Pa PUC Table 7 - Budget and Parity Analysis Summary

Customer Sector	Phase V EE&C Budget (inclusive of allocated common cost)	% of Total EDC EE&C Budget	% of EDC Total Annual Revenue ¹	% of EDC Total MWh Sales ¹
Residential Sector <i>(exclusive of Low-Income)</i>	\$76,058,365	25%	77%	39%
Residential Low Income Sub-Sector ²	\$56,901,391	19%		
Residential Subtotal	\$132,959,756	43%	77%	39%
Small C&I Sector	\$105,934,796	34%	20%	28%
Large C&I Sector	\$68,612,328	22%	3%	33%
Non-Residential Subtotal	\$174,547,124	57%	23%	61%
EDC TOTAL³	\$307,506,880	100%	100%	100%
EDC TOTAL as Share of Budget Ceiling	100.0%			

% Budget by Customer Sector

Customer Sector	% Budget
Residential Sector (exclusive of Low-Income)	25%
Residential Low Income Sub-Sector	19%
Small C&I Sector	34%
Large C&I Sector	22%

% Revenue by Customer Sector

Customer Sector	% Revenue
Residential Subtotal	77%
Small C&I Sector	20%
Large C&I Sector	3%

% MWh Sales by Customer Sector

Customer Sector	% MWh Sales
Residential Subtotal	39%
Small C&I Sector	28%
Large C&I Sector	33%

¹ Based on PPL Electric Utilities’ 2024 revenue and sales.

² Customers in the Low-Income sector are all customers in the residential customer class. Therefore, the Low-Income sector’s figures are included in the Residential part of this table.

³ Total values may not equal the sum of all sector values due to rounding. Budget amounts in this table exclude SWE costs.

3. Program and Component Descriptions

3.1. Process Used for Selection of Programs and Components

PPL Electric Utilities will offer the broadest selection of measures possible for all customer segments through three primary Residential, Business, and Resource Constrained Energy Efficiency Programs. The Residential Energy Efficiency Program will feature incentives that are tiered, based on income, to allow for certain higher incentives for moderate-income customers (151% to 250% of the federal poverty level). This is in addition to fully subsidized measures for customers in the Resource Constrained Energy Efficiency Program (low income: up to 150% of the federal poverty level). The portfolio also provides a new approach to energy efficiency assistance programs that will create a more equitable experience for all customers by allowing income-eligible customers to have access to measures available to standard residential customers, as well as a similar customer journey. This includes a selection of no-cost products through the Company's online marketplace, appliance recycling, student energy efficiency education, and an expanded local contractor network. In addition, the Residential and Resource Constrained Energy Efficiency Programs will be closely coordinated by the selected CSPs to create a portfolio structure that will allow for more efficient and flexible operations and marketing during implementation. The result will be that PPL Electric Utilities' CSPs will reach more customers across all sectors and all income levels, and those customers will have a clearer understanding of energy efficiency offerings, leading to increased participation.

Customers of any sector can take advantage of any eligible measures in the EE&C Plan across programs, with costs to be recovered by the appropriate customer sector. This will allow measures to be applied as needed by the end-use customer, as various residential measures can be useful to business customers and vice versa. This will be an improved and more seamless customer experience. For example, residential customers who own farms can utilize agricultural business measures, and business customers that own multifamily buildings can take advantage of popular residential measures, such as appliance recycling. This approach promotes more comprehensive measure use and provides a more balanced portfolio across customer classes.

PPL Electric Utilities developed separate budgets, targets, and performance objectives for all programs. PPL Electric Utilities will administer, evaluate, and report on program performance at a component level for Residential, Resource Constrained, and Business Energy Efficiency Programs, which will have components separated by customer sector. The remainder of this section provides details on individual programs, program components, and the analysis PPL Electric Utilities conducted to construct its Phase V portfolio.

3.1.1. Portfolio Objectives and Metrics that Define Success

The PPL Electric Utilities Phase V EE&C Plan is designed to meet the requirements set forth by the Public Utility Commission's Phase V Implementation Order. PPL Electric Utilities will monitor progress towards those requirements by tracking and reporting on the implementation data, performing EM&V activities,

and making adjustments as necessary. Table 11 identifies the key portfolio performance indicators PPL Electric Utilities will use to measure success.

Table 11. Key Portfolio Performance Indicators

Key Indicator	Metrics
Market Response	▪ Participants by customer, trade ally, distributor ▪ Feedback from all market actors ▪ Customer satisfaction based on responses to participant surveys administered as part of EM&V activities
Portfolio Performance	▪ kWh/year savings ▪ kW/year savings via measures or demand response
Financial Analysis	▪ Expenditures ▪ Acquisition cost (\$/kWh saved)¹ ▪ TRC benefit/cost ratio

¹ Acquisition cost is the ratio of total EDC expenditures to annual kWh.

3.1.2. Program Design and Construction

PPL Electric Utilities utilized multiple sources of information to develop the programs and program components. This includes Phase IV program evaluations, Pa PUC-provided documentation, including the 2026 Technical Reference Manual Final Order, 2026 Total Resource Cost Test Final Order, and the Market Potential Study. In addition, the Company engaged in extensive external research focused on program design, innovative measures, customer and trade ally perspectives, and territory-specific targeted potential studies. This information was used to determine measure potential within PPL Electric Utilities' territory, with a focus on comprehensive offerings. Participation was estimated based on internal analysis and costs, within the budget cap. This information was augmented by CSP research and analysis derived through the request for proposal process and resulted in a portfolio design with energy savings and coincident peak demand, with separate demand response, targets by program, set sector budgets, and a wide variety of measures to support the EE&C Plan.

The final portfolio structure and associated measures and activities were evaluated from a technical and economic perspective to meet the Act 129 requirements of income-eligible customer considerations, portfolio-level cost-effectiveness, balanced and equitable offerings for all sectors, and, most importantly, a plan that meets all defined compliance goals for Phase V.

3.1.3. Portfolio Measures

The Company included as many available measures, as per the Pa TRM, as possible, to ensure participation pathways for the maximum number of customers. This includes standard energy efficiency measures, limited combined heat and power ("CHP"), renewables, such as solar photovoltaic ("PV"), and a variety of peak demand load shifting measures. These measures exist within each program,

component, and channel offering. Phase V measures included in PPL Electric Utilities' Phase V Plan can be found in Sections 3.2 through 3.4.

3.1.4. Fuel Switching

PPL Electric Utilities plans to include CHP as the only fuel switching measure in Phase V. The impact of CHP in this Plan is lower than prior phases and is based on Company forecasts and market research for Phase V. CHP is a legacy measure available in prior phases and will benefit select C&I customers, including agricultural customers looking to install CHP digesters to generate electricity and heat. CHP projects must meet program eligibility, including any TRC requirements, to receive incentives.

3.1.5. Non-Act 129 Measure Alignment

The Company plans to offer high-efficiency heat pumps, heat pump water heaters, and other applicable measures that may also be available in other non-Act 129 programs. The Company does not plan to offer additional incentives to encourage customers to switch from fossil fuels to electricity, though customers who install eligible products may apply for incentives. Eligibility requirements for these measures are well defined in the Pa TRM, and we expect external programs to align with these requirements and/or collaborate on ensuring their requirements are not less stringent, which would put participating EDCs at risk of non-compliance. If external programs are available, the Company will work to help customers take advantage of all available incentives, lowering costs for customers and extending the reach of all programs. This coordination is explained throughout various sections of this Plan. If the external implementation vendor provides external incentive levels to the Company, PPL Electric Utilities will track this information accordingly. Details and/or data sharing pathways of some external programs are not yet available at the time of this Plan submission, though the Company is committed to meaningful partnerships that benefit customers. Additional information can be found in Section 4.4.1.

3.1.6. Front-of-the-Meter Measures ("FTM")

As outlined in the Residential Energy Efficiency Pilot section, PPL Electric Utilities will allot up to \$1 million for a conservation voltage reduction pilot. There are no plans to utilize non-Act 129 funding sources for FTM equipment installation. If C&I customers receive benefits based on the circuit, feeder, or other distribution infrastructure utilized, those savings and associated costs will be properly attributed to the correct sector. The pilot will be developed in conjunction with the selected EM&V CSP, with evaluation plans submitted to the Phase V SWE for approval. The goal of the pilot is to create and implement a methodology to reduce energy consumption and peak demand through voltage optimization in front of the meter. The pilot will last up to 24 months. As per the Phase V Implementation Order, savings attributed to the pilot will account for no more than 10% of the total savings of the portfolio. Due to uncertainties around pilot implementation, associated savings were not modeled for this Plan. During and at the conclusion of the pilot(s), the EM&V CSP will include evaluation results as part of the annual reporting process. Further details related to this potential pilot may be found in Section 3, Residential Pilot Programs.

3.1.7. Comprehensive Measure Approach

All programs offered by PPL Electric Utilities are comprehensive in that they provide incentives for most measures found in the Pa TRM, including an array of non-lighting, non-kit options, such as HVAC, solar, water heating, efficient equipment, and appliances. The Company defines comprehensive measures specifically as per the Pa PUC's plan template for residential measures, and the definitions for non-residential comprehensive measures follow a similar methodology. Resource Constrained Energy Efficiency Program customers have access to most measures available to all residential customers, though at no cost, providing this important population with equal access to all measures, including comprehensive measures as defined by the Pa PUC, when income verified. The selected measures may be implemented in all building types, through any existing or new delivery channel, for all sectors for which they are applicable, for both existing and new construction. All programs feature education and technical support, where applicable, designed to encourage customers to implement multiple measures in a holistic manner, to maximize the benefits to their home or business. The Residential Energy Efficiency and Resource Constrained Energy Efficiency Programs will also feature custom measures for the implementation of interim measure protocols and any other existing or new measure that is not found in the Pa TRM, similar to the Business Energy Efficiency Program. This will be supported by marketing and awareness campaigns, online tools, and informational resources that will promote a cost-effective, comprehensive, and satisfying customer energy efficiency journey.

3.1.8. Time of Use

PPL Electric Utilities plans to offer education, communication, and outreach related to available time-of-use ("TOU") programs, if available, to ensure customer awareness and maximum participation. This includes any potential future TOU customer options. The Company's goal is to create a complementary environment for Act 129 offerings and Company TOU rates, though it does not plan to claim savings on TOU at the outset of Phase V. PPL Electric Utilities reserves the right to add TOU participation incentives in Phase V if it will lead to better customer outcomes based on ongoing customer satisfaction and experience measurements.

3.2. Residential Energy Efficiency Program

PPL Electric Utilities' Residential Energy Efficiency Program is an umbrella program with components that will be available for the entirety of Phase V, from 2026 through 2031. The Residential Energy Efficiency Program includes measures for both market-rate (above 250% FPL) and moderate-income customers (151% - 250% FPL) through incentive tiers. The program also includes some measures for multifamily building owners, who are part of the small C&I customer sector. Table 12 shows the percentages of the customer sector budgets represented by the Residential Energy Efficiency Program.

Table 12. Percentages of Customer Sector Budgets Represented by the Residential Energy Efficiency Program

Customer Sector	Percentage of Sector Budget
Residential	99.7%
Resource Constrained	0%
Small C&I	1.9%
Large C&I	0%

The Residential Energy Efficiency Program has a cost-effective TRC, as shown in Table 56. Table 13 includes the components of the Residential Energy Efficiency Program and summarizes their expected savings by year and as a share of the total program.

Table 13. Residential Energy Efficiency Program Savings by Component and Program Year

Component	Metric	PY18	PY19	PY20	PY21	PY22	Total Phase V	% of Program
Energy Efficient Homes	Energy Savings (1st year MWh)	35,461	34,747	33,743	18,415	17,524	139,890	82%
	Summer Demand Reduction (MW)	4.52	4.47	4.37	2.65	2.59	18.61	57%
	Winter Demand Reduction (MW)	4.29	4.17	4.04	2.27	2.13	16.90	56%
	Average Demand Reduction (MW)	4.41	4.32	4.21	2.46	2.36	17.75	57%
Appliance Recycling	Energy Savings (1st year MWh)	5,664	5,355	5,353	5,045	5,044	26,462	16%
	Summer Demand Reduction (MW)	1.80	1.69	1.69	1.57	1.57	8.32	25%
	Winter Demand Reduction (MW)	0.25	0.25	0.25	0.25	0.25	1.24	4%
	Average Demand Reduction (MW)	1.03	0.97	0.97	0.91	0.91	4.78	15%
Student Energy Education	Energy Savings (1st year MWh)	933	933	695	695	695	3,950	2%
	Summer Demand Reduction (MW)	0.11	0.11	0.08	0.08	0.08	0.46	1%
	Winter Demand Reduction (MW)	0.18	0.18	0.13	0.13	0.13	0.74	2%
	Average Demand Reduction (MW)	0.14	0.14	0.11	0.11	0.11	0.60	2%
Persistent Demand Response	Energy Savings (1st year MWh)	-	-	-	-	-	-	0%
	Summer Demand Reduction (MW)	5.45	5.45	5.45	5.45	5.45	5.45	17%
	Winter Demand Reduction (MW)	11.10	11.10	11.10	11.10	11.10	11.10	37%

	Average Demand Reduction (MW)	8.27	8.27	8.27	8.27	8.27	8.27	26%
Total Program¹	Energy Savings (1st year MWh)	42,058	41,035	39,791	24,155	23,263	170,302	100%
	Summer Demand Reduction (MW)	11.88	11.71	11.58	9.75	9.69	32.83	100%
	Winter Demand Reduction (MW)	15.81	15.70	15.52	13.75	13.61	29.98	100%
	Average Demand Reduction (MW)	13.85	13.70	13.55	11.75	11.65	31.40	100%

¹ Total values may not equal the sum of all program year or component values due to rounding.

Program and Component Operations and Administration

The selected Residential CSP will provide operational management, administrative support, and implementation activities, while PPL Electric Utilities EE&C staff will provide oversight and administration of all programs and components.

Estimated Program Budget

Table 14 shows the estimated budget by year for the Residential Energy Efficient Program, divided by incentive and non-incentive costs.

Table 14. Pa PUC Table 10 – Residential Energy Efficient Program Budget by Year

Cost Element		PY18	PY19	PY20	PY21	PY22	Phase V Total ¹
Total Budget (\$000)		\$13,221	\$13,573	\$13,869	\$13,303	\$13,588	\$67,554
Incentives (\$000)²	Rebates	\$3,860	\$3,943	\$4,032	\$4,146	\$4,244	\$20,226
	Upstream/Midstream Buydown	\$404	\$468	\$505	\$521	\$536	\$2,434
	Kits	\$516	\$537	\$521	\$541	\$558	\$2,673
	Direct Install Materials & Labor	\$931	\$931	\$931	\$931	\$931	\$4,655
	Incentive Total	\$5,711	\$5,879	\$5,989	\$6,139	\$6,268	\$29,987
Non-Incentives (\$000)³	Program Design	\$296	\$302	\$308	\$270	\$274	\$1,451
	Administrative	\$2,224	\$2,265	\$2,306	\$2,041	\$2,069	\$10,905
	EDC Delivery Costs	\$207	\$210	\$214	\$190	\$192	\$1,013
	CSP Delivery Fees	\$3,895	\$4,009	\$4,127	\$3,853	\$3,961	\$19,846
	Marketing	\$652	\$665	\$678	\$594	\$603	\$3,192
	Other ⁴	\$237	\$242	\$246	\$216	\$219	\$1,161
	Non-Incentive Total	\$7,510	\$7,693	\$7,880	\$7,164	\$7,320	\$37,567
Percent Incentives		43%	43%	43%	46%	46%	44%

¹ Total values may not equal the sum of all program year values due to rounding.

² Braided Funding Support Labor costs are not included in this table because they are estimated to be \$0.

³ EM&V and AEPS Registration Support Costs are not included in this table because AEPS Registration Support Costs are estimated to be \$0 and EM&V costs are included as portfolio costs.

⁴ Indirect CSP Delivery Costs, e.g., fleet vehicles, subscriptions, IT.

Schedule and Milestones for Program and All Components

For all program components, the schedule and milestones include submission of the Company's EE&C Plan on December 1, 2025, launch of Phase V on June 1, 2026, semi-annual reports submitted annually starting on January 15, 2027, annual reports submitted annually starting on September 30, 2027, and the end of all components at the end of the phase on May 31, 2031.

Program and Component EM&V

All EM&V requirements for all program components will be detailed in PPL Electric Utilities' Evaluation plan, submitted to the SWE for review. The Company and third-party EM&V CSP will conduct an evaluation on an annual basis for each program and component to verify savings and establish other key performance indicators, such as incentive costs, administrative costs, and participation. The EM&V CSP will follow all applicable methods in the Pa TRM and the Evaluation Framework to calculate energy savings and coincident peak demand reduction. PPL Electric Utilities' impact and process evaluation activities will vary by year and program component.

Energy Efficient Homes Component

Description

There are four primary delivery channels within the Energy Efficient Homes component. These include the following:

- **New Construction** – This channel provides incentives to either builders or customers for newly constructed single or multifamily homes that exceed existing energy efficiency codes and standards. New for this component is an all-electric tier, which offers increased incentives for all-electric homes. This approach builds on our high-performance pilot in Phase IV.
- **Home Rebates** – Home Rebates channel provides midstream and downstream rebates for efficient HVAC equipment, solar, water heating, appliances, and more. This channel is supported by in-home and remote audits that provide valuable education and recommendations to help customers take advantage of multiple comprehensive rebate opportunities. Comprehensive measures are defined by the Commission in the provided EE&C plan Template Tables Workbook.
- **Instant Discount** – The Instant Discounts channel offers point-of-sale and online marketplace discounts on a variety of energy efficiency products.

Home Energy Reports – Customers will receive email reports, appliance disaggregation, education, and other program recommendations. Paper reports may be used if determined by the Company to be necessary and/or beneficial for the customer. All residential and small- and medium-sized businesses will also be provided with an Energy Analyzer, an online web tool for bill analysis and education. All Home Energy Report offerings will be updated to remove a similar home comparison. This is the result of customer feedback and a goal to make the reports more customer-friendly and educational.

Objective and Target Market

The goal of the Energy Efficient Homes component is to promote the adoption and/or use of efficient buildings, products, and appliances in existing and new residential-use buildings to achieve the gross verified energy and coincident peak demand savings goals shown in Table 13. The Energy Efficient Homes component is designed to target residential homebuilders, all residential sector customers, and commercial and industrial customers that may benefit from residential end-use measures. This component is available to the 1.5 million customers in the PPL Electric Utilities territory who meet eligibility requirements.

Ramp-up and Implementation Strategy

Energy Efficient Homes maintains and enhances existing channels, which will require little ramp-up. Implementation activities continued through the end of Phase IV and will be carried over, supported by marketing and awareness campaigns to create a seamless transition to the new phase. The Energy Efficient Homes component will continue to be delivered by the selected Residential Energy Efficiency Program CSP. The CSP will also operate a customer call center, provide program component marketing and awareness campaigns, process customer incentives, and provide data for the Company's tracking system. PPL Electric Utilities will provide overall strategic direction, administration, and CSP management. The implementation strategy will vary by channel:

- **New Construction** – The CSP will identify, recruit, and educate builders within the EDC territory, provide technical assistance, quality assurance, and control, and issue incentives to builders and homeowners. The CSP will prioritize the creation of all-electric homes with additional incentives for builders.
- **Home Rebates** – The CSP will partner with distributors, trade allies, and manufacturers to promote energy-efficient equipment, products, and services available through the Residential Energy Efficiency Program with both a downstream and midstream approach. The Company will leverage existing partnerships and build new relationships with market actors in PPL Electric Utilities' service territory. PPL Electric Utilities will offer a rebate portal and application process for customers to take advantage of available measure offerings. This channel includes these other features:
 - *PPL Heat Pump Installer Program* – PPL Electric Utilities will offer an enhanced trade ally network component focused on heat pump adoption, proper sizing, and correct installation, as well as promoting other comprehensive program offerings. PPL Electric Utilities may provide basic annual heat pump training, offer training incentives to promote workforce development, and highlight external workforce funding if available. Both customers and contractors who utilize a Heat Pump Installer for their HVAC or water heater project may receive an additional incentive.
 - *Financing Options* – A key hurdle to deeper measure adoption is the initial costs. While energy efficiency incentives can reduce this burden, financing the remaining costs can increase program participation of moderate-income customers. The selected CSP will provide non-utility, third-party financing options for eligible customers.
 - *Moderate Income Tier* – Prior phase participation indicated less participation among moderate-income customers. To support customers who are not eligible for traditional income-eligible programs and may not be able to afford energy efficiency measures, the Company will offer higher incentives on select measures for qualified customers up to 250% of FPL. The Company may change eligibility of this offering, including income eligibility, based on customer need or available funding.
 - *Outreach and Events Team* – The Company will launch a dedicated outreach team to support program CSPs by attending local and community events, such as fairs, conferences,

representative constituent events, business events, and other opportunities to engage with customers directly. The outreach team will support all programs, including Residential Energy Efficiency.

- **Instant Discount** – The CSP will offer customers the opportunity to purchase a variety of eligible efficient products and services through a virtual storefront. In addition, the CSP may offer select point-of-sale rebates on eligible products through point-of-sale retailers.
- **Home Energy Reports** – The CSP will provide custom reports via email on a cadence determined by PPL Electric Utilities to promote energy-efficient behaviors through education, energy usage insights, appliance usage information, and energy cost information. Paper reports may be used if determined by the Company to be necessary and/or beneficial for customers. The reports will also include energy efficiency program recommendations. Customers will also have access to Energy Analyzer, an interactive web tool.

Marketing Strategy

PPL Electric Utilities and current CSPs have deep knowledge of the territory, customer demographics, and industry trends. The marketing strategy will leverage this base and take an adaptive and evolving approach that meets customers' and market actors' needs throughout Phase V. The Company will work with the selected CSP to create a detailed marketing plan that will define the audience, select tactics, employ targeting, and execute campaigns based on industry standards, various research, and historical program data. Successful marketing approaches may include, but will not be limited to, print and email outreach, Company and CSP web assets, social media, regional and national industry partnerships, trade ally, builder, and retailer engagement, point of purchase displays and materials, bill inserts, newsletters, conferences, and events.

- **Underserved Customers** – The Company will offer a variety of new services to ensure underserved customers have an opportunity to participate in the Residential Energy Efficiency Program. This includes a moderate-income tier and financing options, as described above in the Ramp-up and Implementation Strategy section. In addition, a dedicated outreach team will provide a community presence that will create additional program visibility.
- **Multifamily Buildings** – This program component is not contingent on housing type; both homeowners and tenants in all housing types are eligible. Marketing and communication efforts will target the wider population of PPL Electric Utilities' customers, which includes tenants.
- **Coordination** – The Company plans to utilize a single CSP, with qualified subcontractors to administer the portfolio of programs, which reduces barriers to coordination and ensures a high level of visibility across all offerings. This will allow cross-program participation where eligibility allows, as well as a clear understanding of coordination impacts. All programs will be cross-marketed and/or promoted whenever possible to ensure customers take advantage of all options for which they are eligible. For this component, cross-promotion may include recommendations during assessments, dual-purpose email, webinars, in-person events through the community field team, and other similar opportunities to educate customers.

Issues, Risks, and Risk Management

Table 15 shows risks associated with Energy Efficient Homes and how the Company intends to mitigate those risks.

Table 15. Energy Efficient Homes Issues, Risks, and Risk Management Strategies

Delivery Channels Affected	Issue/Risk	Risk Management Strategies
New Construction, Home Rebates	Component awareness – Market actors and/or customers do not take advantage of the component, impacting savings.	The CSP will use targeted messaging that appeals to the specific needs of customers to encourage participation. The Company will support this through broad awareness campaigns.
New Construction, Home Rebates	Equipment/Product Costs – Heat pumps, insulation, and other key measures have higher costs that may be impacted by inflation.	The Company and CSP will focus incentive budgets to reduce incremental costs and educate customers on long-term benefits. In addition, the CSP will provide third-party financing recommendations.
Home Rebates	Low participation for moderate-income customers.	The Company and CSP will offer a moderate-income tier with higher incentives on select measures for qualified customers.
Home Rebates, Instant Discounts	Income-qualifying moderate-income customers.	The Company will work with the selected CSP to develop an online qualification tool for customers in this category.
New Construction, Home Rebates	Potential changes to codes and standards, including changes to ENERGY STAR.	The Company will follow all SWE guidance to ensure appropriate eligibility of products. The Company and CSP will also proactively communicate with customers, where appropriate.
Home Energy Reports	Customer experience – Behavioral programs are mature, and the satisfaction and/or effectiveness may wane over time.	The Company and CSP will vary the content and customize reports. In addition, an Energy Analyzer web tool will enhance the experience. The Company will also remove similar home comparisons.

Energy Efficient Homes: Eligible Measures and Incentives

Table 16 shows PPL Electric Utilities' initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. The cost to the customer for participation varies by measure type. The cost to participating customers is the incremental cost, less the incentive amount.

Incentives were determined based on the service or product incremental cost and the most cost-effective incentive range to ensure customer participation. All incentive levels are designed to comply with the Pa PUC's plan template and Phase V Implementation Order. Not all measures may be available at all times, and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company. In addition, all measures available to customers may be delivered via any available channel to meet the customer's unique needs.

Table 16. Pa PUC TABLE 8 – Residential Energy Efficient Homes Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
LED Lighting - GSL	Per Bulb	No	No	LED	\$4	15	Up to \$25
Nightlight	Per Product	No	No	LED	\$2	8	Up to \$25
Air Source Heat Pump	Per Product	No	Yes	ENERGY STAR, min. 16 SEER	\$2,903	15	Up to \$2,000
Central Air Conditioner	Per Product	No	Yes	ENERGY STAR, min. 16 SEER	\$2,763	15	Up to \$1,000
Ground Source Heat Pump	Per Project	No	Yes	New system following ENERGY STAR HVAC Quality Installation procedures	\$3,509	15	Up to \$8,000
Packaged Terminal Heat Pump/AC	Per Product	No	Yes	ENERGY STAR or equivalent	\$753	15	Up to \$1,000
Central Air Conditioner, Midstream	Per Product	No	Yes	ENERGY STAR, min. 16 SEER	\$2,763	15	Up to \$1,000
Air Source Heat Pump, Midstream	Per Product	No	Yes	ENERGY STAR, min. 16 SEER	\$5,123	15	Up to \$1,000
Packaged Terminal Heat Pump/AC, Midstream	Per Product	No	Yes	ENERGY STAR or equivalent	\$753	15	Up to \$1,000
Ductless Heat Pump	Per Product	No	Yes	ENERGY STAR	\$538	15	Up to \$1,000
ECM Circulation Fans	Per Product	No	No	Replaces low-efficiency permanent split capacitor fan motor	\$353	5	Up to \$1,000

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
GSHP Desuperheaters	Per Product	No	No	Installation on new or existing Ground Source Heat Pump	\$2,260	15	Up to \$1,000
Maintenance - Heat Pump/AC	Per Project	No	No	Professional system tune-up	\$141	3	Up to \$500
Room Air Conditioner	Per Product	No	Yes	ENERGY STAR	\$95	9	Up to \$250
Window Heat Pump	Per Product	No	Yes	Existing electric, non-heat pump heating	\$2,455	9	Up to \$1,000
Duct Sealing & Duct Insulation	Per Project	No	Yes	All accessible duct work sealed throughout the unconditioned and semi-conditioned space in the home.	\$1,684	15	Up to \$6,000
Air Handler Filter Whistles	Per Product	No	No	Applied to central forced-air furnaces, CAC, or heat pump systems	\$5	5	Up to \$25
ENERGY STAR Connected Thermostats	Per Product	No	No	ENERGY STAR	\$168	9	Up to \$250
Furnace Maintenance	Per Product	No	No	Professional system tune-up	\$141	3	Up to \$2,000
ENERGY STAR Bathroom Exhaust Fan	Per Product	No	No	ENERGY STAR	\$312	15	Up to \$100
Heat Pump Water Heater	Per Product	No	Yes	ENERGY STAR	\$920	10	Up to \$1,000

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Solar Water Heater	Per Product	No	Yes	Existing electric water heater	\$1,111	15	Up to \$1,000
Water Heater Tank Wrap	Per Project	No	No	Installation of R-8 wrap insulation to existing electric water heater with R-24 or less	\$89	7	Up to \$50
Water Heater Temperature Setback	Per Product	No	No	Electric water heater	\$12	2	Up to \$50
Water Heater Pipe Insulation	Per Foot	No	No	≥ R-3, unconditioned space, electric water heater	\$5	11	Up to \$50
Low-Flow Faucet Aerator	Per Product	No	No	≤ 1.5 GPM flow rate, homes with electric water heater	\$24	10	Up to \$50
Low-Flow Showerhead	Per Product	No	No	Replaces standard showerhead, homes with electric water heater	\$65	10	Up to \$50
Thermostatic Shower Restriction Valve	Per Product	No	No	Electric water heat	\$42	15	Up to \$50
Drain Water Heat Recovery Unit	Per Product	No	No	Electric water heat	\$735	15	Up to \$4,000
Smart Water Heater Controls	Per Product	No	No	Electric resistance or heat pump storage water heaters	\$156	11	Up to \$1,000
ENERGY STAR Refrigerator	Per Product	No	Yes, if paired with other comprehensive measures	ENERGY STAR	\$395	14	Up to \$1,000
ENERGY STAR Freezers	Per Product	No	Yes, if paired with other	15% more efficient than federal standard	\$39	11	Up to \$1,000

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
			comprehensive measures				
ENERGY STAR Cooler	Per Product	No	Yes, if paired with other comprehensive measures	10 - 30% more efficient than minimum federal standard	\$281	14	Up to \$1,000
Induction Cooktop	Per Product	No	No	Replaces electric range/cooktop	\$1,087	15	Up to \$4,000
ENERGY STAR Clothes Washer	Per Product	No	Yes, if paired with other comprehensive measures	ENERGY STAR	\$36	14	Up to \$2,000
ENERGY STAR Clothes Dryer	Per Product	No	Yes, if paired with other comprehensive measures	ENERGY STAR	\$718	14	Up to \$2,000
ENERGY STAR Dishwasher	Per Product	No	Yes, if paired with other comprehensive measures	ENERGY STAR	\$79	10	Up to \$2,000
ENERGY STAR Dehumidifier	Per Product	No	Yes, if paired with other comprehensive measures	ENERGY STAR	\$618	12	Up to \$1,000

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
ENERGY STAR Ceiling Fan	Per Product	No	No	ENERGY STAR	\$488	10	Up to \$2,000
ENERGY STAR Air Purifier	Per Product	No	No	ENERGY STAR	\$49	9	Up to \$100
Advanced Power Strips	Per Product	No	No	Tier 1 or Tier 2	\$57	5	Up to \$50
Air Sealing	Per Project	No	Yes	Pre- and post-blower door test. $\geq$ 10% improvement. Primary electric heating or central air conditioning.	\$286	15	Up to \$1,000
Weather Stripping, Caulking and Outlet Gaskets - Direct Install	Per Project	No	No	Exterior doors, exterior windows, unconditioned attic hatches/door, or plumbing/electrical penetrations on exterior walls	\$300	15	Up to \$100
Weather Stripping, Caulking and Outlet Gaskets - Kit Delivery	Per Foot	No	No	Weather stripping for exterior door and exterior windows and outlet gaskets	\$1	15	Up to \$50
Ceiling/Attic Insulation	Per SQ Ft	No	Yes	The existing R-value $\leq$ R-30. Final R-value must be $\geq$ R-49, primary electric heat. Rebate cannot exceed the cost of the measure	\$4	15	Up to \$100
Wall Insulation	Per SQ Ft	No	Yes	R-11 Minimum	\$4	15	Up to \$100
Floor Insulation	Per SQ Ft	No	Yes	R-value of R-30 or higher, except for homes in IECC Climate Zone 4, where R-19 is permissible.	\$3	15	Up to \$100

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Rim Joist Insulation	Per SQ Ft	No	Yes	Minimum R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the rim joist.	\$4	15	Up to \$100
Basement or Crawl Space Wall Insulation	Per SQ Ft	No	Yes	Climate Zone 4: R-10 or higher continuous insulation or R-13 cavity insulation Climate Zone 5: R-15 of higher continuous insulation or R-19 cavity insulation; or R-13 cavity insulation and R-5 continuous insulation	\$4	15	Up to \$100
ENERGY STAR Windows	Per SQFT	No	Yes	ENERGY STAR	\$52	15	Up to \$500
Whole Home	Per Home	No	Yes	New construction, > 10% UBC	\$6,912	15	Up to \$10,000
ENERGY STAR Manufactured Homes	Per Home	No	Yes	ENERGY STAR	\$1,985	15	Up to \$5,000
Home Energy Reports	Per Participant	No	No	Residential sector with available energy usage and billing data	\$0	3	Not applicable
ENERGY STAR Pool Pump	Per Product	No	No	ENERGY STAR	\$404	10	Up to \$1,000
Single Speed Pool Pump Replacement	Per Product	No	No	Replaces single speed pump	\$436	3.3	Up to \$1,000
Residential PV Solar	Per Project	No	Yes, if paired with other	≤ 50kW AC systems with interconnection agreement	\$2,720	15	Up to \$1,500

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
			comprehensive measures				
ENERGY STAR Pool Pump Pressure Cleaner Booster	Per Product	No	No	ENERGY STAR	\$64	10	Up to \$100
Bonus for participation across multiple measures	Per Project	No	Yes	Eligible product combination	\$0	1	Up to \$1,000
Heat Pump Installer Rebate	Per Product	No	No	Eligible product	\$0	1	Up to \$1,000
In-Home Audit	Per Project	No	No	Home has primary electric heat or AC	\$450	1	Up to \$1,000

Deadline for Rebate Applications

All rebate and program applications must be associated with projects, installations, or treatments completed between June 1, 2026, and May 31, 2031. Applications must be submitted within 180 days of installation for all measures except comprehensive measures, as defined by the Commission in the plan template, though it will also include solar installations. The rebate application deadline for these measure categories may be extended up to 365 days due to potential delays from issues like supply chain changes, to allow time for proper documentation, or quality control and assurance activities. PPL Electric Utilities, at its discretion, may allow customers to request project preapproval to lock in the stipulated incentive level and guarantee project funding or approve any rebate application that exceeds application deadlines to ensure customer satisfaction. Final program year rebate applications must be submitted by May 31, 2031.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one full-time employee ("FTE"), plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include 25 FTEs. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 17 shows the participation, energy savings, and coincident peak demand estimates for the Energy Efficient Homes component. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

Table 17. Pa PUC Table 9 – Residential Energy Efficient Homes Estimated Savings and Participation

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
LED Lighting - GSL	2.1.1	Energy Savings (MWh)	340.55	340.55	340.55	340.55	340.55	1,702.76
		Summer Demand Reduction (MW)	0.0403	0.0403	0.0403	0.0403	0.0403	0.2013
		Winter Demand Reduction (MW)	0.0403	0.0403	0.0403	0.0403	0.0403	0.2013
		Projected Participation ²	21,390	21,390	21,390	21,390	21,390	106,950
Nightlight	2.1.3	Energy Savings (MWh)	82.66	82.66	82.66	82.66	82.66	413.30
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	20,005	20,005	20,005	20,005	20,005	100,025
Air Source Heat Pump	2.2.1	Energy Savings (MWh)	1,723.01	1,723.01	1,615.33	1,615.33	1,618.73	8,295.41
		Summer Demand Reduction (MW)	0.1153	0.1153	0.1081	0.1081	0.1090	0.5559
		Winter Demand Reduction (MW)	0.0290	0.0290	0.0272	0.0272	0.0282	0.1404
		Projected Participation	800	800	750	750	752	3,852
Central Air Conditioner	2.2.1	Energy Savings (MWh)	309.34	309.34	284.92	305.27	293.06	1,501.95
		Summer Demand Reduction (MW)	0.1842	0.1842	0.1697	0.1818	0.1745	0.8943
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	760	760	700	750	720	3,690
Ground Source Heat Pump	2.2.1	Energy Savings (MWh)	21.50	21.50	21.50	21.50	21.50	107.50
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0062	0.0062	0.0062	0.0062	0.0062	0.0310
		Projected Participation	8	8	8	8	8	40

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Packaged Terminal Heat Pump/AC	2.2.1	Energy Savings (MWh)	0.58	0.58	0.58	0.58	0.58	2.90
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
		Projected Participation	2	2	2	2	2	10
Central Air Conditioner, Midstream	2.2.2	Energy Savings (MWh)	16.80	33.60	50.39	83.99	134.39	319.17
		Summer Demand Reduction (MW)	0.0091	0.0182	0.0273	0.0454	0.0727	0.1727
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	50	100	150	250	400	950
Air Source Heat Pump, Midstream	2.2.2	Energy Savings (MWh)	53.84	107.69	161.53	215.38	269.22	807.66
		Summer Demand Reduction (MW)	0.0036	0.0072	0.0108	0.0144	0.0180	0.0541
		Winter Demand Reduction (MW)	0.0009	0.0018	0.0027	0.0036	0.0045	0.0136
		Projected Participation	25	50	75	100	125	375
Packaged Terminal Heat Pump/AC, Midstream	2.2.2	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.94	0.94
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	4	4
Ductless Heat Pump	2.2.3	Energy Savings (MWh)	3,477.46	3,477.46	3,477.46	3,477.46	3,284.26	17,194.09
		Summer Demand Reduction (MW)	0.2470	0.2470	0.2470	0.2470	0.2333	1.2215
		Winter Demand Reduction (MW)	0.0620	0.0620	0.0620	0.0620	0.0585	0.3064
		Projected Participation	1,800	1,800	1,800	1,800	1,700	8,900

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
ECM Circulation Fans	2.2.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.48	0.48
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	3	3
GSHP Desuperheaters	2.2.5	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.52	0.52
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Maintenance - Heat Pump/AC	2.2.6	Energy Savings (MWh)	1.29	1.29	1.29	1.29	1.29	6.43
		Summer Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0011
		Winter Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0008
		Projected Participation	6	6	6	6	6	30
Room Air Conditioner	2.2.7	Energy Savings (MWh)	7.99	7.99	7.99	7.99	7.99	39.96
		Summer Demand Reduction (MW)	0.0142	0.0142	0.0142	0.0142	0.0142	0.0712
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	895	895	895	895	895	4,475
Window Heat Pump	2.2.9	Energy Savings (MWh)	14.88	14.88	14.88	14.88	14.88	74.39
		Summer Demand Reduction (MW)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0105
		Winter Demand Reduction (MW)	0.0941	0.0941	0.0941	0.0941	0.0941	0.4705
		Projected Participation	35	35	35	35	35	175
Duct Sealing & Duct Insulation	2.2.10	Energy Savings (MWh)	0.00	0.00	0.00	0.00	2.11	2.11
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0006	0.0006

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Projected Participation	0	0	0	0	3	3
Air Handler Filter Whistles	2.2.11	Energy Savings (MWh)	0.01	0.00	0.00	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
ENERGY STAR Connected Thermostats	2.2.12	Energy Savings (MWh)	1,298.46	1,298.46	1,298.46	1,298.46	1,298.46	6,492.28
		Summer Demand Reduction (MW)	0.2504	0.2504	0.2504	0.2504	0.2504	1.2519
		Winter Demand Reduction (MW)	0.1612	0.1612	0.1612	0.1612	0.1612	0.8062
		Projected Participation	6,625	6,625	6,625	6,625	6,625	33,125
Furnace Maintenance	2.2.13	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.01	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Bathroom Exhaust Fan	2.2.14	Energy Savings (MWh)	1.09	1.09	1.09	1.09	1.12	5.46
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0007
		Winter Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0008
		Projected Participation	15	15	15	15	16	76
Heat Pump Water Heater	2.3.1	Energy Savings (MWh)	802.62	839.64	910.72	983.28	1,054.36	4,590.63
		Summer Demand Reduction (MW)	0.1046	0.1094	0.1186	0.1281	0.1373	0.5980
		Winter Demand Reduction (MW)	0.1742	0.1822	0.1977	0.2134	0.2288	0.9963
		Projected Participation	542	567	615	664	712	3,100
	2.3.2	Energy Savings (MWh)	31.44	51.09	62.89	76.64	78.61	300.67

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Solar Water Heater		Summer Demand Reduction (MW)	0.0036	0.0059	0.0073	0.0089	0.0091	0.0348
		Winter Demand Reduction (MW)	0.0061	0.0098	0.0121	0.0148	0.0151	0.0579
		Projected Participation	16	26	32	39	40	153
Water Heater Tank Wrap	2.3.3	Energy Savings (MWh)	17.47	17.47	17.47	17.47	17.47	87.33
		Summer Demand Reduction (MW)	0.0020	0.0020	0.0020	0.0020	0.0020	0.0099
		Winter Demand Reduction (MW)	0.0033	0.0033	0.0033	0.0033	0.0033	0.0166
		Projected Participation	125	125	125	125	125	625

Water Heater Temperature Setback	2.3.4	Energy Savings (MWh)	244.05	244.05	244.05	244.05	244.05	1,220.23
		Summer Demand Reduction (MW)	0.0260	0.0260	0.0260	0.0260	0.0260	0.1299
		Winter Demand Reduction (MW)	0.0434	0.0434	0.0434	0.0434	0.0434	0.2169
		Projected Participation	2,225	2,225	2,225	2,225	2,225	11,125
Water Heater Pipe Insulation	2.3.5	Energy Savings (MWh)	3,259.77	3,154.90	2,997.59	2,735.41	2,211.05	14,358.71
		Summer Demand Reduction (MW)	0.3441	0.3330	0.3163	0.2884	0.2327	1.5144
		Winter Demand Reduction (MW)	0.5670	0.5485	0.5206	0.4742	0.3813	2.4915
		Projected Participation	318,015	308,015	293,015	268,015	218,015	1,405,075
Low-Flow Faucet Aerator	2.3.6	Energy Savings (MWh)	164.51	155.89	147.28	138.66	121.43	727.76
		Summer Demand Reduction (MW)	0.0742	0.0704	0.0666	0.0628	0.0552	0.3291
		Winter Demand Reduction (MW)	0.2168	0.2055	0.1943	0.1830	0.1604	0.9600
		Projected Participation	12,180	11,680	11,180	10,680	9,680	55,400
Low-Flow Showerhead	2.3.7	Energy Savings (MWh)	2,230.45	2,153.57	2,038.25	1,846.04	1,461.63	9,729.93
		Summer Demand Reduction (MW)	0.2343	0.2262	0.2141	0.1939	0.1536	1.0221
		Winter Demand Reduction (MW)	0.3946	0.3810	0.3606	0.3267	0.2587	1.7217

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Projected Participation	32,775	31,775	30,275	27,775	22,775	145,375
Thermostatic Shower Restriction Valve	2.3.8	Energy Savings (MWh)	1.22	1.22	1.22	1.22	1.22	6.10
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0006
		Winter Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0010
		Projected Participation	15	15	15	15	15	75
Drain Water Heat Recovery Unit	2.3.9	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.31	0.31
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	1	1

Smart Water Heater Controls	2.3.10	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Refrigerator	2.4.1	Energy Savings (MWh)	102.29	102.29	102.29	102.29	102.29	511.45
		Summer Demand Reduction (MW)	0.0152	0.0152	0.0152	0.0152	0.0152	0.0758
		Winter Demand Reduction (MW)	0.0114	0.0114	0.0114	0.0114	0.0114	0.0568
		Projected Participation	1,900	1,900	1,900	1,900	1,900	9,500
ENERGY STAR Freezers	2.4.2	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.09	0.09
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
	2.4.5	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
ENERGY STAR Cooler		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Induction Cooktop	2.4.7	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.01	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Clothes Washer	2.4.8	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.13	0.13
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2

ENERGY STAR Clothes Dryer	2.4.9	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.79	0.79
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	7	7
ENERGY STAR Dishwasher	2.4.10	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Dehumidifier	2.4.11	Energy Savings (MWh)	658.16	899.13	1,019.01	1,019.01	1,019.83	4,615.14
		Summer Demand Reduction (MW)	0.1348	0.1842	0.2087	0.2087	0.2089	0.9454
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Projected Participation	4,425	6,050	6,850	6,850	6,852	31,027
ENERGY STAR Ceiling Fan	2.4.13	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.03	0.03
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Air Purifier	2.4.14	Energy Savings (MWh)	214.81	315.90	379.08	379.08	379.08	1,667.97
		Summer Demand Reduction (MW)	0.0267	0.0392	0.0471	0.0471	0.0471	0.2070
		Winter Demand Reduction (MW)	0.0343	0.0505	0.0606	0.0606	0.0606	0.2667
		Projected Participation	850	1,250	1,500	1,500	1,500	6,600
Advanced Power Strips	2.5.1	Energy Savings (MWh)	937.53	937.53	937.53	937.53	937.53	4,687.65
		Summer Demand Reduction (MW)	0.1046	0.1046	0.1046	0.1046	0.1046	0.5228
		Winter Demand Reduction (MW)	0.1438	0.1438	0.1438	0.1438	0.1438	0.7188
		Projected Participation	14,110	14,110	14,110	14,110	14,110	70,550

Air Sealing	2.6.1	Energy Savings (MWh)	226.23	226.23	226.23	226.23	226.23	1,131.17
		Summer Demand Reduction (MW)	0.0038	0.0038	0.0038	0.0038	0.0038	0.0191
		Winter Demand Reduction (MW)	0.0810	0.0810	0.0810	0.0810	0.0810	0.4052
		Projected Participation	149	149	149	149	149	745
Weather Stripping, Caulking and Outlet Gaskets - Direct Install	2.6.2	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.01	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
	2.6.2	Energy Savings (MWh)	54.11	54.11	54.11	54.11	54.11	270.55

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Weather Stripping, Caulking and Outlet Gaskets - Kit Delivery		Summer Demand Reduction (MW)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0105
		Winter Demand Reduction (MW)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0105
		Projected Participation	35,100	35,100	35,100	35,100	35,101	175,501
Ceiling/Attic Insulation	2.6.3	Energy Savings (MWh)	56.17	56.17	56.17	56.17	56.17	280.83
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	425,000	425,000	425,000	425,000	425,000	2,125,000
Wall Insulation	2.6.3	Energy Savings (MWh)	20.30	20.30	20.30	20.30	20.30	101.48
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0075	0.0075	0.0075	0.0075	0.0075	0.0376
		Projected Participation	34,400	34,400	34,400	34,400	34,400	172,000
Floor Insulation	2.6.3	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Rim Joist Insulation	2.6.3	Energy Savings (MWh)	8.00	8.00	8.00	8.00	8.00	40.00
		Summer Demand Reduction (MW)	0.0004	0.0004	0.0004	0.0004	0.0004	0.0021
		Winter Demand Reduction (MW)	0.0028	0.0028	0.0028	0.0028	0.0028	0.0141
		Projected Participation	10,000	10,000	10,000	10,000	10,000	50,000
Basement or Crawl Space Wall Insulation	2.6.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Windows	2.6.5	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Whole Home	2.7.1	Energy Savings (MWh)	1,997.88	2,028.75	2,063.81	2,098.87	2,137.38	10,326.68
		Summer Demand Reduction (MW)	0.8574	0.8643	0.8755	0.8866	0.8990	4.3829
		Winter Demand Reduction (MW)	0.4604	0.4757	0.4888	0.5018	0.5160	2.4428
		Projected Participation	1,085	1,105	1,126	1,147	1,170	5,633
ENERGY STAR Manufactured Homes	2.7.2	Energy Savings (MWh)	1.42	2.83	4.25	4.25	4.25	17.01
		Summer Demand Reduction (MW)	0.0004	0.0008	0.0013	0.0013	0.0013	0.0050
		Winter Demand Reduction (MW)	0.0002	0.0004	0.0006	0.0006	0.0006	0.0026
		Projected Participation	1	2	3	3	3	12
Home Energy Reports	2.7.3	Energy Savings (MWh)	17,082.99	16,057.99	15,093.99	0.00	0.00	48,234.98
		Summer Demand Reduction (MW)	2.1196	1.9924	1.8729	0.0000	0.0000	5.9850
		Winter Demand Reduction (MW)	2.1196	1.9924	1.8729	0.0000	0.0000	5.9850
		Projected Participation	224,031	210,590	197,954	0	0	632,575
ENERGY STAR Pool Pump	2.8.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.11	0.11
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
	2.8.2	Energy Savings (MWh)	0.00	0.00	0.00	0.00	1.59	1.59

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Single Speed Pool Pump Replacement		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0010	0.0010
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Residential PV Solar	2.8.3	Energy Savings (MWh)	0.00	0.00	0.00	0.00	13.25	13.25
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0045	0.0045
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0006	0.0006
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Pool Pump Pressure Cleaner Booster	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.06	0.06
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Bonus for participation across multiple measures	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	800	800	800	800	803	4,003
Heat Pump Installer Rebate	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	501	600	700	800	1,000	3,601
In-Home Audit	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1,250	1,250	1,250	1,250	1,250	6,250

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹

¹Total values may not equal the sum of all program year values due to rounding.

²Projected participation is based on the unit value for the corresponding measure in Table 16.

Appliance Recycling Component

Description

PPL Electric Utilities will continue to offer scheduling, free pick-up, and environmentally responsible recycling of a variety of appliances, including, though not limited to, refrigerators and compact refrigerators, freezers, dehumidifiers, room air conditioners, and other appliances deemed acceptable by the Company. PPL Electric Utilities plans to offer real-time alerts for customers to support the stress-free pickup of their appliances by notifying customers in advance of when program staff arrive to collect their appliances and providing confirmation once it has been collected. The disposal process involves removing hazardous materials, such as chlorinated fluorocarbons, from the refrigerant and foam insulation, preparing refrigerant for reclamation, and recycling other materials, including metal and plastic. PPL Electric Utilities reserves the right to set and/or change the program requirements and eligibility, including minimum and maximum appliance sizes, number of units for pickup, and appliance type and condition. PPL Electric Utilities plans to offer curbside and in-home appliance pickup for one or more units, though it may offer other pickup options at its discretion. The Company plans to offer appliance recycling events to which customers may bring eligible appliances for recycling and receive an incentive.

Objective and Target Market

The goal of the Appliance Recycling component is to promote the environmentally responsible retirement and/or use of efficient appliances in existing residential end-use buildings to achieve high customer satisfaction and the gross verified energy and coincident peak demand savings goals shown in Table 13. Through the component, the Company intends to promote other PPL Electric Utilities energy efficiency offerings, enhance relationships with retailers selling new appliances, and prevent the resale of units on the secondary market. The Appliance Recycling component is designed to target all residential sector customers and C&I customers that may benefit from residential end-use appliance recycling measures. This component is available to the 1.5 million customers in the PPL Electric Utilities territory who meet eligibility requirements.

Ramp-up and Implementation Strategy

Appliance Recycling is an active and popular offering, which requires little ramp-up. Implementation activities continued through the end of Phase IV, and activities will be carried over with marketing and awareness to support a successful transition to Phase V. The Appliance Recycling component will continue to be delivered by the selected Residential Energy Efficiency Program CSP. The CSP will provide a call center for appointment scheduling and customer support, provide program component marketing and awareness campaigns, process customer incentives,

and provide data for the Company's tracking system. PPL Electric Utilities will provide overall strategic direction, administration, and CSP management, while the EM&V CSP will provide evaluation services.

Marketing Strategy

PPL Electric Utilities and current CSPs have deep knowledge of the territory, customer demographics, and industry trends. The marketing strategy will leverage this base and take an adaptive and evolving approach that meets customers' and market actors' needs throughout Phase V. The Company will work with the CSP to create a detailed marketing plan that will define the audience, select tactics, employ targeting, and execute campaigns based on industry standards, various research, and historical program data. Successful marketing approaches may include, but will not be limited to, print and email outreach, Company and CSP web assets, social media, outreach to multifamily building owners and operators, community events, retailer outreach and training, outreach to new refrigerator rebate participants, bill inserts, and/or newsletters.

- **Underserved Customers** – The Company will offer appliance recycling to income-eligible customers through the Resource Constrained Energy Efficiency Program.
- **Multifamily** – In addition, the Company will focus on multifamily opportunities to ensure maximum benefits are provided to tenants, both income-eligible and standard residential customers.
- **Coordination** – The Company plans to utilize a single CSP, with qualified subcontractors to administer the portfolio of programs, which reduces barriers to coordination and ensures a high level of visibility across all offerings. This will allow cross-program participation where eligibility allows, as well as a clear understanding of coordination impacts. All programs will be cross-marketed and/or promoted whenever possible to ensure customers take advantage of all options for which they are eligible. For this component, cross-promotion may include dual-purpose bill inserts or email campaigns, as well as customer leave-behinds during appliance pickups.

Issues, Risks, and Risk Management

Table 18 shows risks associated with Appliance Recycling and how the Company intends to mitigate those risks.

Table 18. Appliance Recycling Issues, Risks, and Risk Management Strategies

Component(s) Affected	Issue/Risk	Risk Management Strategies
Appliance Recycling	Customer awareness of offering.	The Company will work with the selected CSP to create an effective marketing strategy that includes community events, bill inserts, social media, and other channels.
Appliance Recycling	Diminished returns due to newer appliances in use in the territory.	The Company will work with the selected CSP to highlight the importance of recycling older units, including secondary appliances, through all available communication channels.

Appliance Recycling Eligible Measures and Incentives

Table 19 shows PPL Electric Utilities’ initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. There is no expected cost for customer participation. Incentives were determined based on the most cost-effective incentive range to ensure customer participation. All incentive levels are designed to comply with the Pa PUC’s plan template and Implementation Order. Measures not available in the TRM will be considered custom measures with an incentive range up to \$200 per unit. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company. In addition, all measures available to customers may be delivered via any available channel to meet the customer’s unique needs.

Table 19. Pa PUC TABLE 8 – Residential Appliance Recycling Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Recycling - Room AC	Per Product	No	No	Working unit, no direct replacement	\$15	3	Up to \$100

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Recycling - Refrigerator/Freezer	Per Product	No	No	Working unit, 10-30 cubic ft	\$35	5	Up to \$200
Recycling - Low-Capacity Refrigerator/Freezer	Per Product	No	No	Working unit, ≤ 10 cubic ft	\$15	5	Up to \$100
Recycling - Cooler	Per Product	No	No	Working unit	\$15	5	Up to \$100
Recycling - Dehumidifier	Per Product	No	No	Working room dehumidifier unit, no direct replacement	\$15	4	Up to \$100

Deadline for Rebate Applications

There is no rebate application for this component.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one FTE, plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include 11 FTEs. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 20 shows the participation, energy savings, and coincident peak demand estimates for the Appliance Recycling component. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

Table 20. Pa PUC Table 9 – Residential Appliance Recycling Estimated Savings and Participation

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Recycling - Room AC	2.2.8	Energy Savings (MWh)	618.88	574.68	574.68	530.47	530.53	2,829.24
		Summer Demand Reduction (MW)	1.1513	1.0690	1.0690	0.9868	0.9869	5.2631
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation ²	3,500	3,250	3,250	3,000	3,001	16,001
Recycling - Refrigerator/Freezer	2.4.3	Energy Savings (MWh)	2,334.21	2,334.21	2,334.21	2,334.93	2,333.32	11,670.88
		Summer Demand Reduction (MW)	0.3449	0.3449	0.3449	0.3450	0.3448	1.7244
		Winter Demand Reduction (MW)	0.2640	0.2640	0.2640	0.2641	0.2638	1.3199
		Projected Participation	3,230	3,230	3,230	3,231	3,229	16,150
Recycling - Low-Capacity Refrigerator/Freezer	2.4.4	Energy Savings (MWh)	55.44	55.44	55.44	55.44	55.44	277.22
		Summer Demand Reduction (MW)	0.0082	0.0082	0.0082	0.0082	0.0082	0.0410
		Winter Demand Reduction (MW)	0.0061	0.0061	0.0061	0.0061	0.0061	0.0305
		Projected Participation	213	213	213	213	213	1,067
Recycling - Cooler	2.4.6	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.37	0.37
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Recycling - Dehumidifier	2.4.12	Energy Savings (MWh)	2,655.42	2,390.94	2,388.82	2,124.34	2,124.34	11,683.87
		Summer Demand Reduction (MW)	0.4584	0.4128	0.4124	0.3667	0.3667	2.0170
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	2,500	2,251	2,249	2,000	2,000	11,000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹

¹ Total values may not equal the sum of all program year values due to rounding.

² Projected participation is based on the unit value for the corresponding measure in Table 19.

Student Energy Efficiency Education Component

Description

PPL Electric Utilities will continue to provide in-class presentations and/or school-based events to educate students and their families about energy safety, use, management, and conservation through hands-on activities, discussions, multimedia, and other materials deemed appropriate by the Company. Where possible, PPL Electric Utilities will align grade-level content with the Pennsylvania State Academic Standards. Students who participate in the presentations or events will receive a package of energy efficiency products to take home and install with the help of a trusted adult. In addition, the Company, with the support of the CSP, may also offer contests and challenges which provide the students and educators with additional opportunities to engage with the material and demonstrate energy efficiency learnings. Participating educators will receive lesson plans, training information, materials, and/or energy efficiency products to help reinforce energy efficiency education before and after the presentations. There are four planned Student Energy Efficiency Education channels, though the Company may choose to expand or contract these channels based on participation:

- **Primary Grade** – Presentations for Students and Educators in grades 2 – 3.
- **Intermediate Grade** – Presentations for Students and Educators in grades 5 – 7.
- **Secondary Grade** – Presentations for Students and Educators in grades 9 – 12.
- **Student Energy Efficiency Events** – This may include participation in school assemblies, Parent Teacher Organization events, Parent Nights, and/or back-to-school events, and local club or sporting events.

Objective and Target Market

The goal of the Student Energy Efficiency Education component is to promote energy efficiency in educational settings to inform students about energy efficiency behaviors and activities through enjoyable and interactive presentations utilizing high-quality curricula. This education is designed to be a first step in a longer energy efficiency journey, empowering participants, now and in the future. The informational aspect is supported through energy efficiency measures made available to students and educators that can be used in classrooms and installed at home. All materials, information, and products are designed to achieve high student and educator satisfaction. The Student Energy Efficiency Education component is designed to target residential sector customers and educators at schools serving the students and their families.

Ramp-up and Implementation Strategy

The Student Energy Efficiency Education component is a continuation from Phase IV, and PPL Electric Utilities has existing relationships with school districts across the territory. The component is highly popular with both students and educators. The selected Residential Energy Efficiency Program CSP will implement the component and provide marketing in conjunction with the Company, provide school recruitment, curriculum development, on-site presentations, and event management, while also

providing any take-home materials and energy efficiency products. The CSP will also provide a call center and support services for educators and administrators and provide data for the Company's tracking system. PPL Electric Utilities will provide overall strategic direction, administration, and CSP management, while the EM&V CSP will provide evaluation services.

Marketing Strategy

The Company and CSP will create a marketing strategy for potential schools and districts designed to promote the empowerment of students as energy leaders at school and at home. The selected Residential Energy Efficiency Program CSP will promote the program to a list of qualified PPL Electric Utilities' territory schools through awareness materials and marketing efforts to participants primarily through email and direct mail. The messaging will emphasize interactive learning, community impact, and engaging classroom activities. Whenever possible, at-risk and disadvantaged communities will be prioritized and served through the Resource Constrained Energy Efficiency Program. Other outreach strategies include:

- **Underserved Customers** – The Company will offer Student Energy Efficiency Education to income-eligible households through the Resource Constrained Energy Efficiency Program as noted above.
- **Multifamily Buildings** – This program component is not contingent on housing type; students of both homeowners and tenants in all housing types are eligible. Communication and marketing are school-focused, not customer-dependent.
- **Coordination** – The Company plans to utilize a single CSP, with qualified subcontractors to administer the portfolio of programs, which reduces barriers to coordination and ensures a high level of visibility across all offerings. This will allow cross-program participation where eligibility allows, as well as a clear understanding of coordination impacts. All programs will be cross-marketed and/or promoted whenever possible to ensure customers take advantage of all options for which they are eligible. For this component, cross-promotion may include energy kit inserts describing other program offerings.

Issues, Risks, and Risk Management

Table 21 shows risks associated with Student Energy Efficiency Education and how the Company intends to mitigate those risks.

Table 21. Student Energy Efficiency Issues, Risks, and Risk Management Strategies

Component(s) Affected	Issue/Risk	Risk Management Strategies
Student Energy Efficiency	Lack of interest or engagement from secondary-level students. This may lead to low satisfaction scores.	The Company will work with the selected CSP to ensure content is up to date, engaging, and age-appropriate for all participants.

Student Energy Efficiency Education Eligible Measures and Incentives

Table 22 shows PPL Electric Utilities' initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. There is no expected cost for customers to participate. All incentive levels are designed to comply with the Pa PUC's plan template and Implementation Order. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company. There is no cost for students or educators to participate in this program component. In addition, all measures available to customers may be delivered via any available channel to meet the customer's unique needs.

Table 22. Pa PUC TABLE 8 – Residential Student Energy Efficiency Education Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
LED Lighting - GSL	Per Bulb	No	No	LED	\$4	15	100% of measure cost
Linear LED fixture	Per Product	No	No	LED	\$6	15	100% of measure cost
Lighting Occupancy Sensor	Per Product	No	No	Occupancy sensors and/or connected (“smart”) lighting installed inside a residential unit	\$17	8	100% of measure cost
Nightlight	Per Product	No	No	LED	\$2	8	100% of measure cost
Holiday Lights	Per Product	No	No	LED	\$17	10	100% of measure cost
Air Handler Filter Whistles	Per Product	No	No	Applied to central forced-air furnaces, CAC, or heat pump systems	\$2	5	100% of measure cost
Water Heater Temperature Setback	Per Product	No	No	Electric water heater where applicable	\$12	2	100% of measure cost
Low-Flow Faucet Aerator	Per Product	No	No	≤ 1.5 GPM flow rate, homes with electric water heater	\$2	10	100% of measure cost
Low-Flow Showerhead	Per Product	No	No	Replaces standard showerhead, homes with electric water heater where applicable	\$5	10	100% of measure cost
Thermostatic Shower Restriction Valve	Per Product	No	No	Electric water heat where applicable	\$17	15	100% of measure cost
Advanced Power Strips	Per Product	No	No	Tier 1 or Tier 2	\$19	5	100% of measure cost

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Weather Stripping, Caulking and Outlet Gaskets - Kit Delivery	Per Foot	No	No	Weather stripping for exterior doors and exterior windows and outlet gaskets	\$1	15	100% of measure cost

Deadline for Rebate Applications

There is no rebate application for this component.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one FTE, plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include two FTEs. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 23 shows the participation, energy savings, and coincident peak demand estimates for the Student Energy Efficiency program component. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

**Table 23. Pa PUC Table 9 – Residential Student Energy Efficiency Education
Estimated Savings and Participation**

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
LED Lighting - GSL	2.1.1	Energy Savings (MWh)	195.97	195.97	142.06	142.06	142.23	818.28
		Summer Demand Reduction (MW)	0.0232	0.0232	0.0168	0.0168	0.0168	0.0967
		Winter Demand Reduction (MW)	0.0232	0.0232	0.0168	0.0168	0.0168	0.0967
		Projected Participation ²	11,400	11,400	8,550	8,550	8,554	48,454
Linear LED fixture	2.1.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.02	0.02
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Lighting Occupancy Sensor	2.1.2	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.04	0.04
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Nightlight	2.1.3	Energy Savings (MWh)	12.40	12.40	9.30	9.30	9.30	52.68
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	3,000	3,000	2,250	2,250	2,250	12,750

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Holiday Lights	2.1.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.03	0.03
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Air Handler Filter Whistles	2.2.11	Energy Savings (MWh)	18.70	18.70	14.02	14.02	14.02	79.46
		Summer Demand Reduction (MW)	0.0045	0.0045	0.0034	0.0034	0.0034	0.0190
		Winter Demand Reduction (MW)	0.0048	0.0048	0.0036	0.0036	0.0036	0.0204
		Projected Participation	2,800	2,800	2,100	2,100	2,100	11,900
Water Heater Temperature Setback	2.3.4	Energy Savings (MWh)	307.11	307.11	230.34	230.34	230.34	1,305.24
		Summer Demand Reduction (MW)	0.0327	0.0327	0.0245	0.0245	0.0245	0.1390
		Winter Demand Reduction (MW)	0.0546	0.0546	0.0409	0.0409	0.0409	0.2320
		Projected Participation	2,800	2,800	2,100	2,100	2,100	11,900
Low-Flow Faucet Aerator	2.3.6	Energy Savings (MWh)	37.39	37.39	28.05	28.05	28.05	158.93
		Summer Demand Reduction (MW)	0.0174	0.0174	0.0130	0.0130	0.0130	0.0739
		Winter Demand Reduction (MW)	0.0498	0.0498	0.0373	0.0373	0.0373	0.2115
		Projected Participation	3,600	3,600	2,700	2,700	2,700	15,300
Low-Flow Showerhead	2.3.7	Energy Savings (MWh)	109.01	109.01	81.76	81.76	81.76	463.30
		Summer Demand Reduction (MW)	0.0115	0.0115	0.0086	0.0086	0.0086	0.0490
		Winter Demand Reduction (MW)	0.0193	0.0193	0.0145	0.0145	0.0145	0.0822
		Projected Participation	2,800	2,800	2,100	2,100	2,100	11,900
	2.3.8	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.08	0.08
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Thermostatic Shower Restriction Valve		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Advanced Power Strips	2.5.1	Energy Savings (MWh)	252.34	252.34	189.25	189.25	189.25	1,072.43
		Summer Demand Reduction (MW)	0.0281	0.0281	0.0211	0.0211	0.0211	0.1196
		Winter Demand Reduction (MW)	0.0387	0.0387	0.0290	0.0290	0.0290	0.1644
		Projected Participation	3,800	3,800	2,850	2,850	2,850	16,150
Weather Stripping, Caulking and Outlet Gaskets - Kit Delivery	2.6.2	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1

¹Total values may not equal the sum of all program year values due to rounding.

² Projected participation is based on the unit value for the corresponding measure in Table 22.

Persistent Peak Demand Component

Description

The Persistent Peak Demand Reduction component is designed to reduce electric system demand during the defined peak periods through the coordinated deployment of thermostat optimization, managed electric vehicle (“EV”) charging, and battery storage. This offering supports grid reliability, defers capacity investments, and enhances the integration of variable renewable energy resources. The component features three channels:

- **Thermostat Optimization** – This channel will leverage smart thermostats by enabling pre-conditioning and dynamic temperature adjustments during defined critical peak hours for existing customer-owned thermostats. Participating thermostats will receive signals to reduce HVAC operation while maintaining occupant comfort, based on predictive algorithms and real-time system conditions.
- **EV Managed Charging** – In parallel, the managed EV charging channel will utilize either utility or CSP control or customer-enrolled scheduling to shift EV charging away from peak hours, reducing aggregate residential demand during the defined peak periods for existing customer-owned vehicles and eligible chargers. The Company may align managed charging with time-of-use EV rates, if they exist, within Phase V to ensure a seamless customer experience.
- **Battery Storage** – This channel will enroll existing residential battery systems to participate in demand management through the CSP Distributed Energy Resource Management Systems (“DERMS”) platforms with existing battery partner integrations for customer-owned battery storage systems.

Objective and Target Market

The objective of the Persistent Peak Demand Reduction component is to establish a scalable, cost-effective residential demand response program using behavioral, smart thermostat optimization, and managed EV charging to reduce peak electric demand and support grid reliability for customers. The target market for the thermostat optimization channel is residential customers with eligible central HVAC systems and compatible, existing, or newly purchased smart thermostats. While customers may purchase a Company-incentivized thermostat, the target demographic is customers who have already opted into utility demand response programs through an existing thermostat original equipment manufacturer. For the EV managed charging channel, the target is residential customers with EVs and existing or newly purchased at-home charging equipment that can be effectively networked into the component. For battery storage, the target demographic is customers with an existing battery storage system. Approximately 1.2 million residential customers will be eligible for demand response incentives.

Ramp-up and Implementation Strategy

The program will launch with a ramp-up phase targeting a limited number of residential customers in the beginning of program year 18 to validate load reduction potential and customer experience across

all channels. This includes launching marketing in high-propensity zones within the PPL Electric Utilities’ territory, testing operational cycles, and assessing customer experience, comfort feedback, and technology performance. During the remainder of the first year, the component will incrementally expand to reach the full expected participation levels, contingent on performance metrics, cost-effectiveness, and grid needs and seek to maintain those levels throughout the phase. Integration with existing smart thermostat rebate incentives and utility EV outreach will support enrollment scalability.

Marketing Strategy

The marketing objective is to drive enrollment and sustained engagement, which is critical to the adopted framework, which averages savings across program years. The component will be marketed through digital outreach, utility bill inserts, community partnerships, and trade ally networks. Messaging will focus on customer incentives, bill savings, comfort retention, and environmental impact. A customer portal will provide access to participation status, energy reports, and scheduling preferences for EV charging. Behavioral engagement strategies, such as usage feedback and comparative analytics, will support continual retention and satisfaction. Ongoing measurement and verification will track peak demand reduction, participation levels, and customer satisfaction, with the Company leveraging annual reporting to assess progress and inform refinements to messaging and program implementation. The marketing strategy will also rely on key market actor partnerships, including original equipment manufacturers and retailers that are essential for co-marketing, as well as EV dealerships and charging equipment installers. The Company and CSP will also work with charger network operators, EV installers, and local housing programs to identify and recruit eligible multifamily properties, supported by resident engagement and education to encourage program support. The CSP will provide a single landing page with eligibility information and incentive details, as well as integration with original equipment manufacturer platforms for direct opt-in. The CSP may also leverage annual participation recognition and a tiered incentive structure featuring upfront opt-in incentives with an ongoing seasonal or annual incentive. Income-eligible customers will not be targeted with persistent demand reduction offerings at the outset of the phase due to the unproven customer experience with a daily load shifting approach. The Company may choose to include these populations in the future.

Issues, Risks, and Risk Management

Table 24 shows risks associated with Persistent Peak Demand and planned mitigation strategies.

Table 24. Persistent Peak Demand Issues, Risks, and Risk Management Strategies

Component(s) Affected	Issue/Risk	Risk Management Strategies
Persistent Peak Demand	Low customer participation in EV managed charging – enrolling and retaining adequate customers to meet goals.	The Company will offer compelling incentives and partner with trusted brands. The enrollment process will be simplified with an easy opt-out option.

Persistent Peak Demand	Customer comfort concerns for thermostat optimization, leading to high levels of opt-out.	The CSP will ensure override options and clear communication about expected impacts. The CSP will gather feedback to continually optimize the offering.
Persistent Peak Demand	Technology integration challenges.	The Company and CSP will pre-qualify technology partners through an organized integration process and use open standards if possible.

Persistent Peak Demand Eligible Measures and Incentives

Table 25 shows PPL Electric Utilities' initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. There is no expected cost for customers to participate. All incentive levels are designed to comply with the Pa PUC's plan template and Implementation Order. Measures within this component may not have a direct customer incentive due to the nature of daily load shift programs. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company.

Table 25. Pa PUC TABLE 8 – Persistent Peak Demand Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
EV Managed Charging	Per Device	No	No	Eligible charging equipment or vehicle	\$90	1	Up to \$750
Thermostat Optimization	Per Device	No	No	Opted-in, eligible thermostat	\$0	1	Up to \$300
Residential BESS ¹	Per Participant	No	No	Opted-in, eligible product	\$456	1	Up to \$1,500

¹ BESS is Battery Energy Storage System

Deadline for Rebate Applications

There is no rebate application for this component, though the Company may choose to provide this option at its discretion. For particular channels, once customers opt in or sign up, participation will be measured per season through the selected evaluation methodology (i.e., usage analysis). If customers participate at the required and agreed-upon level, rebates will be sent to customers directly without additional required action. Customers must be actively enrolled for the entire season in order to qualify for that season's incentive.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one and a half FTEs, plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include five FTEs. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 26 shows the participation and peak demand reduction estimates for the Persistent Peak Demand component. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

Table 26. Pa PUC Table 9 – Persistent Peak Demand Estimated Savings and Participation

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
EV Managed Charging	2.9.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.12	0.12	0.12	0.12	0.12	0.1223
		Winter Demand Reduction (MW)	0.12	0.12	0.12	0.12	0.12	0.1223
		Projected Participation ²	750	750	750	750	750	750
Thermostat Optimization	2.9.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	3.16	3.16	3.16	3.16	3.16	3.1565
		Winter Demand Reduction (MW)	6.66	6.66	6.66	6.66	6.66	6.6647
		Projected Participation	25,800	25,800	25,800	25,800	25,800	25,800
Residential BESS	2.9.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	2.64	2.64	2.64	2.64	2.64	2.6426
		Winter Demand Reduction (MW)	5.29	5.29	5.29	5.29	5.29	5.2853
		Projected Participation	1,200	1,200	1,200	1,200	1,200	1,200

¹Total values may not equal the sum of all program year values due to rounding.

²Projected participation is based on the unit value for the corresponding measure in Table 25.

Residential Pilot Programs

Description

Conservation Voltage Reduction (“CVR”) Pilot – Due to quickly evolving technology, methods, and policies related to energy efficiency, PPL Electric Utilities may allot up to \$1 million for the CVR pilot. If C&I customers receive benefits based on the circuit, feeder, etc., utilized, those savings and associated costs will be properly attributed to the correct sector. The pilot will be developed in conjunction with the selected EM&V CSP, with evaluation plans submitted to the Phase V SWE for approval. The objective of the pilot is to create and implement a methodology to reduce energy consumption and peak demand through voltage optimization in front of the meter. The Company will evaluate a potential CVR pilot through research to establish weather-normalized feeder performance baseline parameters that may inform potential CVR savings estimates and support planning and evaluation of any CVR deployment. A key research question is whether the Company has the existing technology, including substation line tap changers and voltage regulators, to implement a CVR program that is in line with Act 129, as well as evaluate any costs of such equipment. If viable, the Company will establish parameters to safely and effectively reduce voltage in front of customer meters to reduce energy consumption. Metrics to be tracked include baseline voltage, voltage adjustments, time on versus off, and overall energy impacts. The potential savings related to this pilot have not been included in the Plan’s forecasted savings due to uncertainty around pilot design and implementation. The pilot may last up to 24 months from the start. Energy and peak demand savings attributed to the pilot will account for no more than 10% of the total savings of the total portfolio savings. At the conclusion of the pilot(s), the EM&V CSP will include evaluation results as part of the annual reporting process.

Peak Time Rebates (Behavioral Demand Response) Pilot – PPL Electric Utilities may allot up to \$1 million for a Peak Time Rebate (“PTR”) demand response pilot for residential customers. The objective of the pilot is to test the effectiveness of a static, seasonal rebate with a performance bonus. A key research question is to understand if a PTR can encourage residential customers to shift energy usage away from peak periods during both summer and winter seasons. Metrics to be tracked include customer enrollment by season, customer performance by appliance or equipment, attrition rates, and overall peak demand impacts. The pilot may last up to 24 months, though the start date may occur after the start of Phase V. Peak demand reductions from the pilot are forecasted to be approximately 800 kW, though this may change based on the final pilot design. The potential savings related to this pilot have not been included in the Plan’s forecasted savings due to uncertainty around pilot design and implementation. If C&I customers receive any pilot benefits, those savings and associated costs will be properly attributed to the correct sector. This pilot may feature peak-time rebates to encourage behavior change, as well as incentives for customers to move to future TOU rates, if available. At the conclusion of the pilot(s), the EM&V CSP will include evaluation results as part of the annual reporting process. At the conclusion of the pilot(s), the EM&V CSP will include evaluation results as part of the annual reporting process.

PPL Electric Utilities reserves the right to propose additional pilots as deemed necessary by the Company to demonstrate new technology, methods, program design, or for any other reason, utilizing allocated contingency funding and in alignment with the funding limitations in Section 9.1.4. All proposed pilots will be filed with the Commission for review, as is outlined in the Final Implementation Order.

3.3. Resource Constrained Energy Efficiency Program

The Pa PUC Plan V Template includes the Low-Income Programs as section 3.2.1. PPL Electric Utilities has included it as a separate section rather than a subsection of the Residential Sector Program to align with its portfolio organization.

PPL Electric Utilities' Resource Constrained Energy Efficiency Program, previously known as the Low-Income Program, is a customer assistance program with three primary components that will be available for the entirety of Phase V, from 2026 through 2031. The program takes a new approach to energy assistance programs by aligning measure and channel delivery with the Residential Energy Efficiency Program, keeping the existing participation pathways while expanding options for income-eligible customers. The Resource Constrained Energy Efficiency Program includes measures for customers at or below 150% of the federal poverty level; only measures outlined within this program will be attributed to the low-income carveout. The program includes several measures targeted toward owners of multifamily buildings, who fall within the Small C&I customer sector.

Table 27 shows the percentages of the customer sector budgets represented by the Resource Constrained Energy Efficiency Program.

Table 27. Percentages of Customer Sector Budgets Represented by the Resource Constrained Energy Efficiency Program

Customer Sector	Percentage of Sector Budget
Residential	0%
Resource Constrained	100%
Small C&I	0.6%
Large C&I	0%

The Resource Constrained Energy Efficiency Program includes the majority of residential measures available in the Pa TRM, ensuring the Company meets the minimum number of measures required for income-eligible customers. The Resource Constrained Energy Efficiency Program budget is 19% of the total portfolio budget, and the program's TRC can be found in Table 56 in Section 8. PPL Electric Utilities does not anticipate carryover savings from Phase IV to meet the Phase V low-income carveout.

Table 28 includes the components of the Resource Constrained Energy Efficiency Program and summarizes their expected costs and savings by year and as a share of the total program.

Table 28. Resource Constrained Energy Efficiency Program Savings by Program Year

Component	Metric	PY18	PY19	PY20	PY21	PY22	Total Phase V	% of Program
Energy Efficient Homes	Energy Savings (MWh)	15,374	13,495	13,508	11,900	8,690	62,967	83%
	Summer Demand Reduction (MW)	1.56	1.38	1.38	1.23	0.93	6.48	70%
	Winter Demand Reduction (MW)	2.22	1.98	1.96	1.76	1.38	9.29	85%
	Average Demand Reduction (MW)	1.89	1.68	1.67	1.50	1.15	7.89	78%
Appliance Recycling	Energy Savings (MWh)	1,082	1,082	1,082	1,082	1,082	5,410	7%
	Summer Demand Reduction (MW)	0.37	0.37	0.37	0.37	0.37	1.84	20%
	Winter Demand Reduction (MW)	0.04	0.04	0.04	0.04	0.04	0.21	2%
	Average Demand Reduction (MW)	0.21	0.21	0.21	0.21	0.21	1.03	10%
Student Energy Education	Energy Savings (MWh)	1,383	1,383	1,621	1,621	1,621	7,629	10%
	Summer Demand Reduction (MW)	0.16	0.16	0.19	0.19	0.19	0.88	10%
	Winter Demand Reduction (MW)	0.26	0.26	0.31	0.31	0.31	1.44	13%
	Average Demand Reduction (MW)	0.21	0.21	0.25	0.25	0.25	1.16	12%
Total Program¹	Energy Savings (MWh)	17,839	15,960	16,211	14,603	11,393	76,007	100%
	Summer Demand Reduction (MW)	2.09	1.91	1.94	1.79	1.48	9.20	100%
	Winter Demand Reduction (MW)	2.52	2.28	2.31	2.11	1.73	10.94	100%
	Average Demand Reduction (MW)	2.31	2.09	2.12	1.95	1.60	10.07	100%

¹ Total values may not equal the sum of all program year or component values due to rounding.

Program and Component Operations and Administration

The selected Resource Constrained Energy Efficiency CSP will provide operational management while closely coordinating with the Residential Energy Efficiency CSP, administrative support, and implementation activities. PPL Electric Utilities EE&C staff will provide oversight and administration of all programs and components.

Schedule and Milestones for Program and All Components

For all program components, the schedule and milestones include submission of the Company's EE&C Plan on December 1, 2025, launch of Phase V on June 1, 2026, semi-annual reports submitted annually starting on January 15, 2027, annual reports submitted annually starting on September 30, 2027, and the end of all components at the end of the phase on May 31, 2031.

Estimated Program Budget

Table 29 shows the estimated budget by year for the Resource Constrained Energy Efficient Program, divided by incentive and non-incentive costs.

Table 29. Pa PUC Table 10 – Resource Constrained Energy Efficient Program Budget by Year

Cost Element		PY18	PY19	PY20	PY21	PY22	Phase V Total ¹
Total Budget (\$000)		\$11,100	\$10,395	\$10,366	\$9,690	\$8,384	\$49,934
Incentives (\$000)²	Rebates	\$39	\$39	\$39	\$39	\$39	\$196
	Upstream/Midstream Buydown	\$79	\$79	\$79	\$79	\$79	\$395
	Kits	\$739	\$763	\$821	\$847	\$867	\$4,037
	Direct Install Materials & Labor	\$5,705	\$5,153	\$5,238	\$4,770	\$3,674	\$24,539
	Incentive Total	\$6,562	\$6,035	\$6,177	\$5,736	\$4,659	\$29,168
Non-Incentives (\$000)³	Program Design	\$175	\$165	\$156	\$144	\$131	\$770
	Administrative	\$1,255	\$1,190	\$1,127	\$1,042	\$958	\$5,572
	EDC Delivery Costs	\$135	\$128	\$121	\$112	\$103	\$600
	CSP Delivery Fees	\$2,457	\$2,389	\$2,324	\$2,232	\$2,143	\$11,545
	Marketing	\$379	\$358	\$338	\$312	\$285	\$1,672
	Other ⁴	\$137	\$130	\$123	\$113	\$104	\$607
	Non-Incentive Total	\$4,538	\$4,360	\$4,189	\$3,954	\$3,725	\$20,766
Percent Incentives		59%	58%	60%	59%	56%	58%

¹ Total values may not equal the sum of all program year values due to rounding.

² Braided Funding Support Labor costs are not included in this table because they are estimated to be \$0.

³ EM&V and AEPS Registration Support Costs are not included in this table because AEPS Registration Support Costs are estimated to be \$0 and EM&V costs are included as portfolio costs.

⁴ Indirect CSP Delivery Costs, e.g., fleet vehicles, subscriptions, IT.

Program and Component EM&V

All EM&V requirements for all program components will be detailed in PPL Electric Utilities' Evaluation plan, submitted to the SWE for review. The Company and third-party EM&V CSP will conduct an evaluation on an annual basis for each program and component to verify savings and establish other key performance indicators, such as program direct costs, administrative costs, and participation. The EM&V CSP will follow all applicable methods in the TRM and the Evaluation Framework to calculate energy savings and coincident peak demand reduction. PPL Electric Utilities' impact and process evaluation activities will vary by year and program component.

Energy Efficient Homes Component

Description

The Energy Efficient Homes component is the primary program component and features four delivery channels for the Resource Constrained Energy Efficiency Program. These include the following:

- **Single Family Energy Assessment** – This channel provides customers with energy education and a broad array of available measures, similar to the Residential Energy Efficiency Program, though at no cost to qualifying customers. The goal of the channel is to maximize comprehensive offerings while meeting Pa PUC mandates, even when customers do not have electric heat. Customers may receive an in-person or virtual assessment, with a focus on home performance analysis that may lead to comprehensive measures, defined in the Commission’s plan template tables, for all eligible customers. Measures may include refrigerator, freezer, dehumidifier, and other appliance replacement; room-specific HVAC replacement, such as room air conditioners; heat pump water heater installation for customers with electric water heating; and a wide variety of other direct install measures, such as water reduction, water pipe insulation, and advanced smart strips. Qualified technicians will determine the appropriate measures based on assessment findings.
- **Electric Heat Customers** – Customers who have existing electric heating systems may also be eligible for HVAC system maintenance, HVAC replacement, solar, building shell measures, and controls, such as smart thermostats. This is in addition to measures available to all eligible program participants.
- **Health and Safety** – PPL Electric Utilities will continue to install no-cost smoke and carbon monoxide detectors as needed in customer homes. In addition, the Company will allocate up to \$1.5 million for health and safety repairs and/or upgrades needed to install comprehensive measures. This builds on the successful Phase IV Health and Safety Pilot. Measures may include, but are not limited to, electrical, plumbing, carpentry, moisture remediation, indoor air quality issues, or any other barrier determined by the Company to be preventing comprehensive measures.
- **Expanded Trade Ally Network** – PPL Electric Utilities will work with the selected CSP to expand the available direct discount trade allies available to participants, with a focus on local, trusted community businesses. The CSP will reduce barriers to contractor participation and provide meaningful technical assistance and training. This will support the community workforce and economic development.
- **Comprehensive Funding** – There is no budget cap on comprehensive measures, though the Company reserves the right to reduce or eliminate specific measures based on available funding.
- **Multifamily Energy Assessment** – Individually and master-metered customers and/or tenants are eligible for participation with landlord, owner, or building operator approval. All occupants of multifamily buildings will have access to the same measures as Single-Family Energy Assessment customers, including comprehensive measures when applicable, though measure

selection and application will be determined by a qualified multifamily technician to ensure applicability. Income eligibility for master-metered buildings will be based on attestation from the building owner, landlord, or operator, and subject to approval by the Company and program CSP.

- **Landlord Incentives** – Landlords providing consent for multifamily projects may be provided a direct incentive per building site. This approach will encourage higher levels of consent and engagement and increase participation.
- **Common Spaces** – Qualifying common space opportunities will be coordinated directly with the Business Energy Efficiency Program to take advantage of rebates for which these projects are eligible. Where possible, landlords will be directed to and/or coordinated with state-funded programs to take advantage of additional incentives to make these projects more feasible.
- **Program Coordination** – The chosen CSP will have a dedicated multifamily outreach coordinator and installation team to ensure multifamily knowledge and best practices are utilized. In the event that outside funding is available, such as Inflation Reduction Act programs, the outreach coordinator will act as the primary point of contact to ensure appropriate program and funding braiding, to maximize customer benefits.
- **Multifamily Funding** – There is no budget cap on multifamily participation, though the Company reserves the right to reduce or eliminate any offering based on available funding and/or to ensure compliance targets are met. All costs for master-metered multifamily will be appropriately recovered by the proper customer sector.
- **Instant Discount** – The Instant Discount channel offers select online marketplace products with associated savings for income-verified customers at no cost. Customers will be able to select products via the online marketplace at no cost, though subject to eligibility, such as a maximum number of products per account, as determined by the Company. The Company will also offer select instant discount measures at no cost through retail partners such as Habitat ReStore and Salvation Army, which cater to income-eligible customers. Instant Discount is a new offering for this segment in Phase V.
- **Home Energy Reports** – Select customers will receive email reports specifically tailored to income-eligible customers with the purpose of driving customers to primary programs, and these reports will not contain any similar home comparisons. Paper reports may be used if determined by the Company to be necessary and/or beneficial for the customer. The Company does not plan to claim savings for income-eligible home energy reports at the beginning of Phase V, though it reserves the right to do so later in the phase, if deemed appropriate. All customers at or below 150% of the federal poverty guidelines will also be provided an Energy Analyzer, an online web tool for bill analysis and education.

Objective and Target Market

The goal of the Energy Efficient Homes component in the Resource Constrained Energy Efficiency Program is to promote the adoption and/or use of no-cost efficient products and appliances in existing

qualified residential single and multifamily buildings to achieve the gross verified energy and coincident peak demand savings goals shown in Table 28. The Company also intends to continue to educate and empower disadvantaged households and communities through effective energy education and advisement. The Energy Efficient Homes component is designed to target residential sector customers at or below 150% of the federal poverty level, estimated at 325,000, and commercial and industrial multifamily customers serving income-eligible tenants that may benefit from program measures. Customers above 150% of the federal poverty level will have the opportunity to participate in the Residential Energy Efficiency Program and receive increased incentives through the moderate-income tier if eligible.

Ramp-up and Implementation Strategy

Energy Efficient Homes leverages the Phase IV Low-Income Program's existing framework, though the new channels available to income-eligible customers will require coordination and integration across CSPs. The Energy Efficient Homes component will be delivered by a selected Resource Constrained Program Energy Efficiency Program CSP. Certain elements of the program may be administered by the Residential Energy Efficiency Program CSP, such as online marketplace access and home energy reports. These requirements were noted in both the program request for proposals, and PPL Electric Utilities will manage the coordination between CSPs. Implementation activities for primary program functions continued through the end of Phase IV and will be carried over, supported by targeted marketing and awareness campaigns for potentially eligible customers, especially around new offerings, to create a seamless transition to Phase V. The CSP(s) will also operate customer call centers, provide program component marketing and awareness campaigns, process customer intake, perform assessments, work with a closed network of trade allies for direct installation of measures, and provide data for the Company's tracking system. PPL Electric Utilities will provide overall strategic direction, administration, and CSP management.

Marketing Strategy

PPL Electric Utilities and the Phase IV CSP have deep knowledge of disadvantaged communities within the PPL Electric Utilities service territory, customer demographics, and specific issues facing this critical segment of the residential customer base. The marketing strategy will leverage historical trends, emerging research on income-eligible communities, lessons learned from the prior phases, and take a flexible and adjustable approach that meets customer needs throughout Phase V. This includes a close partnership with LIURP, as well as cross-promotion through other assistance programs, such as OnTrack. The Company will work with the selected CSP to develop a detailed marketing plan that will create strategies to engage difficult-to-reach populations, provide messaging that is understandable and effective, incorporate effective tactics with integrated, interactive bilingual materials and web assets, employ targeting, and execute campaigns based on customer preferences, leveraging income-eligible specific research and historical program data. Successful marketing approaches may include, but will not be limited to, print and email outreach, Company and CSP web assets, social media, community and town halls, fairs and local events, homeowner association and landlord engagement, displays and local

advertising, bill inserts, newsletters, and direct customer outreach. In addition, the Company may utilize welcome kits featuring Pa TRM eligible measures, not as a primary savings driver, but as an introduction to a deeper customer journey towards more comprehensive measures. Company research indicates that kit recipients are more aware of all assistance programs than customers who did not receive a kit, likely due to cross-promotion.

LIURP Program Coordination

PPL Electric Utilities will build on the existing and successful collaboration with LIURP to ensure customers receive the maximum available benefits between both programs and to reduce customer acquisition costs. This includes the customer's program assignment that is invisible to the customer, though it is based on the best possible customer outcome. Projects and/or measures may be jointly funded by the Resource Constrained Energy Efficiency Program and LIURP, reducing contractor visits to customer homes and extending the available funding of both programs. The Company may split measure costs between the programs as is necessary. Other program coordination activities will include joint marketing, integrated customer intake, administrative collaboration and management alignment, and consistent quality assurance and control approaches.

External Program Coordination

PPL Electric Utilities, as well as other Pennsylvania EDCs, have successful programs that align with community benefits goals of proposed Inflation Reduction Act ("IRA") programs, the Weatherization Assistance Program, and other energy assistance programs. In addition, the Company and CSPs maintain relationships with a network of qualified trade allies critical to the success of all programs. PPL Electric Utilities will offer measures common to all programs in the Resource Constrained Energy Efficiency Program, including heat pumps and heat pump water heaters, which will ensure possible coordination if IRA funding is available in Phase V, as expected. The Company and selected CSP will work with external program implementation vendor(s) to ensure minimal impact to customers and appropriate incentive stacking. The Company, as per Pa PUC Commission guidance, will claim full savings for any measure for which Act 129 funding is applied. The Company also reserves the right to cease coordination of programs based on poor customer experience, risk to its compliance goals, or for any other reason deemed necessary by the Company. Further details related to external program coordination can be found in Section 4.4.

Issues, Risks, and Risk Management

Table 30 shows risks associated with Energy Efficient Homes and how the Company intends to mitigate those risks.

Table 30. Energy Efficient Homes Issues, Risks, and Risk Management Strategies

Delivery Channels Affected	Issue/Risk	Risk Management Strategies
Single and Multifamily Energy Assessment	There is a lack of program knowledge and low prioritization compared to other basic needs.	Customer and external stakeholder survey results indicate that respondents are motivated by learning how to reduce costs and increase home comfort – the CSP will focus messaging on these areas. In addition, the Company has created a Low-Income Needs Assessment dashboard tool to help the CSP target underserved communities and those with the highest opportunity for program services.
Single Family Energy Assessment	Company research indicates that poor building conditions may prevent comprehensive measure installation.	The Company will increase available health and safety funding to \$1.5 million to resolve potential issues.
Multifamily Energy Assessment	Difficulty securing landlord approval for participation by tenants.	The Company will offer a landlord incentive and a dedicated multifamily outreach coordinator to coordinate multiple project sites.
Multifamily Energy Assessment	Issues with program coordination with potential state programs.	The Company and CSP will have measures also available in a variety of external programs for potential cost sharing, and a flexible framework that encourages coordination. The CSP will also have a dedicated coordinator to ensure a seamless customer experience and maximum benefits.
Instant Discounts	Identifying income-eligible customers.	The Company will work with the selected CSP to develop an online qualification tool for customers in this category.
Single and Multifamily Energy Assessment	Potential changes to codes and standards, including changes to ENERGY STAR	The Company will follow all SWE guidance to ensure appropriate eligibility of products.

Energy Efficient Homes: Eligible Measures and Incentives

Table 31 shows PPL Electric Utilities’ initial measures, eligibility qualifications, incentive ranges, incremental costs, and estimated useful life. PPL Electric Utilities expects all measures provided to income-eligible customers will be subsidized at 100% of the full measure cost, requiring no customer contribution or sharing of incremental costs between participants and the Company. Measures not available in the TRM will be considered custom measures. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company. There is no cap on comprehensive

measure offerings, though the availability of comprehensive measures is based on available funding and compliance target requirements.

Table 31. Pa PUC TABLE 8 – Resource Constrained Energy Efficient Homes Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
LED Lighting - GSL	Per Bulb	Yes	No	LED	\$11	15	100% of measure cost
Linear LED fixture	Per Product	Yes	No	LED	\$21	15	100% of measure cost
Lighting Occupancy Sensor	Per Product	Yes	No	Occupancy sensors and/or connected (“smart”) lighting installed inside a residential unit	\$96	8	100% of measure cost
Nightlight	Per Product	Yes	No	LED	\$5	8	100% of measure cost
Holiday Lights	Per Product	Yes	No	LED	\$17	10	100% of measure cost
Ductless Heat Pump	Per Product	Yes	Yes	ENERGY STAR	\$17,333	15	100% of measure cost
ECM Circulation Fans	Per Product	Yes	No	Replaces low-efficiency permanent split capacitor fan motor	\$100	5	100% of measure cost
Maintenance - Heat Pump/AC	Per Project	Yes	No	Professional system tune up	\$619	3	100% of measure cost
Room Air Conditioner	Per Product	Yes	Yes	ENERGY STAR	\$95	9	100% of measure cost
Room AC Replacement	Per Product	Yes	No	Replaces working unit	\$591	3	100% of measure cost
Window Heat Pump	Per Product	Yes	Yes	Existing electric, non-heat pump heating	\$3,500	9	100% of measure cost
Duct Sealing & Duct Insulation	Per Project	Yes	Yes	All accessible duct work sealed throughout the unconditioned and semi-conditioned space in the home.	\$4,221	15	100% of measure cost
Air Handler Filter Whistles	Per Product	Yes	No	Applied to central forced-air furnaces, CAC, or heat pump systems	\$4	5	100% of measure cost
ENERGY STAR Connected Thermostats	Per Product	Yes	No	ENERGY STAR	\$428	9	100% of measure cost
ENERGY STAR Bathroom Exhaust Fan	Per Product	Yes	No	ENERGY STAR	\$352	15	100% of measure cost
Heat Pump Water Heater	Per Product	Yes	Yes	ENERGY STAR	\$4,502	10	100% of measure cost

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Solar Water Heater	Per Product	Yes	Yes	Existing electric water heater	\$9,567	15	100% of measure cost
Water Heater Tank Wrap	Per Project	Yes	No	Installation of R-8 wrap insulation to existing electric water heater with R-24 or less	\$39	7	100% of measure cost
Water Heater Temperature Setback	Per Product	Yes	No	Electric water heater	\$13	2	100% of measure cost
Water Heater Pipe Insulation	Per Foot	Yes	No	≥ R-3, unconditioned space, electric water heater	\$2	11	100% of measure cost
Low-Flow Faucet Aerator	Per Product	Yes	No	≤ 1.5 GPM flow rate, homes with electric water heater	\$4	10	100% of measure cost
Low-Flow Showerhead	Per Product	Yes	No	Replaces standard showerhead, homes with electric water heater	\$21	10	100% of measure cost
Thermostatic Shower Restriction Valve	Per Product	Yes	No	Electric water heat	\$39	15	100% of measure cost
Smart Water Heater Controls	Per Product	Yes	No	Electric resistance or heat pump storage water heaters	\$668	11	100% of measure cost
Refrigerator Replacement	Per Product	Yes	No	Replaces working unit, 10-30 cubic ft	\$1,300	6	100% of measure cost
Freezer Replacement	Per Product	Yes	No	Replaces working unit, 10-30 cubic ft	\$820	5	100% of measure cost
Cooler Replacement	Per Project	Yes	No	Replaces working unit	\$700	9	100% of measure cost
ENERGY STAR Clothes Washer	Per Product	Yes	Yes, if paired with other comprehensive measures	ENERGY STAR	\$36	14	100% of measure cost
ENERGY STAR Clothes Dryer	Per Product	Yes	Yes, if paired with other comprehensive measures	ENERGY STAR	\$718	14	100% of measure cost
ENERGY STAR Dishwasher	Per Product	Yes	Yes, if paired with other	ENERGY STAR	\$450	10	100% of measure cost

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
			comprehensive measures				
ENERGY STAR Dehumidifier	Per Product	Yes	Yes, if paired with other comprehensive measures	ENERGY STAR	\$2,026	12	100% of measure cost
ENERGY STAR Ceiling Fan	Per Product	Yes	No	ENERGY STAR	\$422	10	100% of measure cost
ENERGY STAR Air Purifier	Per Product	Yes	No	ENERGY STAR	\$394	9	100% of measure cost
Advanced Power Strips	Per Product	Yes	No	Tier 1 or Tier 2	\$56	5	100% of measure cost
Air Sealing	Per CFM	Yes	Yes	Pre- and post-blower door test. $\geq 10\%$ improvement. Primary electric heating or central air conditioning.	\$1	15	100% of measure cost
Weather Stripping, Caulking and Outlet Gaskets - Direct Install	Per Project	Yes	No	Exterior doors, exterior windows, unconditioned attic hatches/door, or plumbing/electrical penetrations on exterior walls	\$35	15	100% of measure cost
Weather Stripping, Caulking and Outlet Gaskets - Kit Delivery	Per Project	Yes	No	Weather stripping for exterior doors and exterior windows and outlet gaskets	\$30	15	100% of measure cost
Ceiling/Attic Insulation	Per SQ Ft	Yes	Yes	The existing R-value $\leq$ R-30. Final R-value must be $\geq$ R-49, primary electric heat. Rebate cannot exceed the cost of the measure	\$4	15	100% of measure cost
Wall Insulation	Per SQ Ft	Yes	Yes	R-11 Minimum	\$3	15	100% of measure cost
Floor Insulation	Per SQ Ft	Yes	Yes	R-value of R-30 or higher, except for homes in IECC Climate Zone 4, where R-19 is permissible.	\$3	15	100% of measure cost
Rim Joist Insulation	Per SQ Ft	Yes	Yes	Minimum R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the rim joist.	\$3	15	100% of measure cost

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Basement or Crawl Space Wall Insulation	Per SQ Ft	Yes	Yes	Climate Zone 4: R-10 or higher continuous insulation or R-13 cavity insulation Climate Zone 5: R-15 of higher continuous insulation or R-19 cavity insulation; or R-13 cavity insulation and R-5 continuous insulation	\$4	15	100% of measure cost
ENERGY STAR Windows	Per SQ Ft	Yes	Yes	ENERGY STAR	\$23	15	100% of measure cost
Home Energy Reports	Per Participant	Yes	No	Residential sector with available energy usage and billing data	\$0	3	100% of measure cost
Energy Saving Education	Per Project	Yes	No	Eligible assessment participant	\$158	1	100% of measure cost
Health & Safety	Per Project	Yes	No	Improvement required for safe installation of energy efficiency measure	\$3,000	1	100% of measure cost

Deadline for Rebate Applications

There is no cost to eligible customers and no required rebate application.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one FTE, plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include 30 FTEs. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 32 shows the participation, energy savings, and coincident peak demand reduction estimates for the Energy Efficient Homes component. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

**Table 32. Pa PUC Table 9 – Resourced Constrained Energy Efficient Homes
Estimated Savings and Participation**

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
LED Lighting - GSL	2.1.1	Energy Savings (MWh)	6,334.13	5,410.68	5,410.68	4,394.48	2,574.45	24,124.41
		Summer Demand Reduction (MW)	0.7264	0.6206	0.6206	0.5041	0.2955	2.7671
		Winter Demand Reduction (MW)	0.7458	0.6371	0.6371	0.5175	0.3033	2.8410
		Projected Participation ²	133,100	114,600	114,600	94,560	58,074	514,934
Linear LED fixture	2.1.1	Energy Savings (MWh)	9.02	7.52	7.52	6.02	3.01	33.09
		Summer Demand Reduction (MW)	0.0011	0.0009	0.0009	0.0008	0.0004	0.0042
		Winter Demand Reduction (MW)	0.0011	0.0009	0.0009	0.0007	0.0004	0.0039
		Projected Participation	420	350	350	280	140	1,540
Lighting Occupancy Sensor	2.1.2	Energy Savings (MWh)	0.93	0.89	0.89	0.85	0.76	4.33
		Summer Demand Reduction (MW)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0013
		Winter Demand Reduction (MW)	0.0003	0.0003	0.0003	0.0002	0.0002	0.0012
		Projected Participation	110	95	95	80	50	430
Nightlight	2.1.3	Energy Savings (MWh)	64.40	57.11	57.11	49.82	35.24	263.69
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	15,500	13,750	13,750	12,000	8,500	63,500
Holiday Lights	2.1.4	Energy Savings (MWh)	0.44	0.33	0.33	0.33	0.33	1.77
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	81	56	56	56	56	305

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Ductless Heat Pump	2.2.3	Energy Savings (MWh)	105.45	105.45	105.45	105.45	105.45	527.24
		Summer Demand Reduction (MW)	0.0189	0.0189	0.0189	0.0189	0.0189	0.0944
		Winter Demand Reduction (MW)	0.0168	0.0168	0.0168	0.0168	0.0168	0.0839
		Projected Participation	50	50	50	50	50	250
ECM Circulation Fans	2.2.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.48	0.48
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	3	3
Maintenance - Heat Pump/AC	2.2.6	Energy Savings (MWh)	15.26	11.12	14.13	14.13	13.68	68.32
		Summer Demand Reduction (MW)	0.0023	0.0019	0.0022	0.0022	0.0022	0.0108
		Winter Demand Reduction (MW)	0.0018	0.0012	0.0016	0.0016	0.0016	0.0078
		Projected Participation	55	44	52	52	52	255
Room Air Conditioner	2.2.7	Energy Savings (MWh)	0.01	0.01	0.01	0.01	0.01	0.04
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	1	1	1	1	5
Room AC Replacement	2.2.8	Energy Savings (MWh)	7.71	6.82	6.82	6.82	6.82	34.99
		Summer Demand Reduction (MW)	0.0143	0.0127	0.0127	0.0127	0.0127	0.0651
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	130	115	115	115	115	590
Window Heat Pump	2.2.9	Energy Savings (MWh)	19.83	16.47	13.42	9.76	6.10	65.59
		Summer Demand Reduction (MW)	0.0028	0.0023	0.0019	0.0014	0.0009	0.0092

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.1246	0.1035	0.0843	0.0613	0.0383	0.4121
		Projected Participation	65	54	44	32	20	215
Duct Sealing & Duct Insulation	2.2.10	Energy Savings (MWh)	15.76	12.37	12.37	12.37	12.37	65.22
		Summer Demand Reduction (MW)	0.0018	0.0014	0.0014	0.0014	0.0014	0.0076
		Winter Demand Reduction (MW)	0.0042	0.0033	0.0033	0.0033	0.0033	0.0174
		Projected Participation	24	19	19	19	19	101
Air Handler Filter Whistles	2.2.11	Energy Savings (MWh)	54.43	54.26	54.26	54.26	54.26	271.46
		Summer Demand Reduction (MW)	0.0130	0.0130	0.0130	0.0130	0.0130	0.0650
		Winter Demand Reduction (MW)	0.0139	0.0139	0.0139	0.0139	0.0139	0.0694
		Projected Participation	8,123	8,102	8,102	8,102	8,102	40,531
ENERGY STAR Connected Thermostats	2.2.12	Energy Savings (MWh)	100.98	110.15	123.90	137.66	161.43	634.12
		Summer Demand Reduction (MW)	0.0113	0.0125	0.0143	0.0160	0.0187	0.0728
		Winter Demand Reduction (MW)	0.0157	0.0169	0.0188	0.0206	0.0243	0.0962
		Projected Participation	240	256	280	304	340	1,420
ENERGY STAR Bathroom Exhaust Fan	2.2.14	Energy Savings (MWh)	0.07	0.07	0.07	0.07	0.14	0.43
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	1	1	1	1	3	7
Heat Pump Water Heater	2.3.1	Energy Savings (MWh)	41.46	35.54	34.06	34.06	25.17	170.30
		Summer Demand Reduction (MW)	0.0054	0.0046	0.0044	0.0044	0.0033	0.0222
		Winter Demand Reduction (MW)	0.0090	0.0077	0.0074	0.0074	0.0055	0.0370
		Projected Participation	28	24	23	23	17	115

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Solar Water Heater	2.3.2	Energy Savings (MWh)	1.97	0.00	0.00	0.00	0.00	1.97
		Summer Demand Reduction (MW)	0.0002	0.0000	0.0000	0.0000	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0004	0.0000	0.0000	0.0000	0.0000	0.0004
		Projected Participation	1	0	0	0	0	1
Water Heater Tank Wrap	2.3.3	Energy Savings (MWh)	40.80	34.93	34.93	29.06	17.33	157.06
		Summer Demand Reduction (MW)	0.0046	0.0040	0.0040	0.0033	0.0020	0.0178
		Winter Demand Reduction (MW)	0.0077	0.0066	0.0066	0.0055	0.0033	0.0298
		Projected Participation	292	250	250	208	124	1,124
Water Heater Temperature Setback	2.3.4	Energy Savings (MWh)	521.00	438.74	438.74	356.47	164.53	1,919.47
		Summer Demand Reduction (MW)	0.0555	0.0467	0.0467	0.0380	0.0175	0.2044
		Winter Demand Reduction (MW)	0.0926	0.0780	0.0780	0.0634	0.0292	0.3412
		Projected Participation	4,750	4,000	4,000	3,250	1,500	17,500
Water Heater Pipe Insulation	2.3.5	Energy Savings (MWh)	1,014.20	927.87	927.87	863.12	733.62	4,466.68
		Summer Demand Reduction (MW)	0.1085	0.0992	0.0992	0.0923	0.0783	0.4776
		Winter Demand Reduction (MW)	0.1817	0.1661	0.1661	0.1544	0.1310	0.7991
		Projected Participation	69,200	65,200	65,200	62,200	56,200	318,000
Low-Flow Faucet Aerator	2.3.6	Energy Savings (MWh)	910.86	822.10	822.10	786.44	719.68	4,061.18
		Summer Demand Reduction (MW)	0.1540	0.1439	0.1439	0.1399	0.1324	0.7142
		Winter Demand Reduction (MW)	0.3472	0.3303	0.3303	0.3235	0.3108	1.6420
		Projected Participation	17,510	16,510	16,510	16,110	15,360	82,000
Low-Flow Showerhead	2.3.7	Energy Savings (MWh)	2,567.62	2,300.70	2,300.70	2,193.47	1,965.31	11,327.81
		Summer Demand Reduction (MW)	0.2872	0.2569	0.2569	0.2448	0.2191	1.2650

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.4835	0.4326	0.4326	0.4122	0.3688	2.1296
		Projected Participation	16,030	15,030	15,030	14,630	13,780	74,500
Thermostatic Shower Restriction Valve	2.3.8	Energy Savings (MWh)	21.47	18.44	18.44	15.41	9.40	83.16
		Summer Demand Reduction (MW)	0.0022	0.0019	0.0019	0.0016	0.0010	0.0085
		Winter Demand Reduction (MW)	0.0037	0.0032	0.0032	0.0027	0.0016	0.0143
		Projected Participation	353	303	303	253	154	1,366
Smart Water Heater Controls	2.3.10	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.09	0.09
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Refrigerator Replacement	2.4.3	Energy Savings (MWh)	20.13	16.10	16.10	16.10	16.10	84.54
		Summer Demand Reduction (MW)	0.0030	0.0024	0.0024	0.0024	0.0024	0.0125
		Winter Demand Reduction (MW)	0.0030	0.0024	0.0024	0.0024	0.0024	0.0128
		Projected Participation	25	20	20	20	20	105
Freezer Replacement	2.4.3	Energy Savings (MWh)	1.04	1.04	1.04	1.04	1.04	5.20
		Summer Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0008
		Winter Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0006
		Projected Participation	4	4	4	4	4	20
Recycling - Cooler	2.4.6	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.37	0.37
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
ENERGY STAR Clothes Washer	2.4.8	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.13	0.13
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
ENERGY STAR Clothes Dryer	2.4.9	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.79	0.79
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	7	7
ENERGY STAR Dishwasher	2.4.10	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Dehumidifier	2.4.11	Energy Savings (MWh)	10.49	8.99	9.17	9.17	9.63	47.45
		Summer Demand Reduction (MW)	0.0021	0.0018	0.0019	0.0019	0.0020	0.0097
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	50	44	44	44	46	227
ENERGY STAR Ceiling Fan	2.4.13	Energy Savings (MWh)	1.73	1.06	1.06	1.06	1.06	5.98
		Summer Demand Reduction (MW)	0.0002	0.0001	0.0001	0.0001	0.0001	0.0007
		Winter Demand Reduction (MW)	0.0003	0.0002	0.0002	0.0002	0.0002	0.0012
		Projected Participation	65	40	40	40	40	225
ENERGY STAR Air Purifier	2.4.14	Energy Savings (MWh)	13.90	13.90	13.90	13.90	13.90	69.50
		Summer Demand Reduction (MW)	0.0017	0.0017	0.0017	0.0017	0.0017	0.0086

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0022	0.0022	0.0022	0.0022	0.0022	0.0111
		Projected Participation	55	55	55	55	55	275
Advanced Power Strips	2.5.1	Energy Savings (MWh)	2,248.59	2,013.89	2,013.89	1,880.91	1,453.18	9,610.47
		Summer Demand Reduction (MW)	0.2718	0.2431	0.2431	0.2267	0.1743	1.1590
		Winter Demand Reduction (MW)	0.3357	0.3007	0.3007	0.2811	0.2175	1.4357
		Projected Participation	28,172	25,522	25,522	23,702	18,742	121,660
Air Sealing	2.6.1	Energy Savings (MWh)	7.78	7.78	7.78	7.78	7.78	38.91
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005
		Winter Demand Reduction (MW)	0.0025	0.0025	0.0025	0.0025	0.0025	0.0126
		Projected Participation	10,300	10,300	10,300	10,300	10,300	51,500
Weather Stripping, Caulking and Outlet Gaskets - Direct Install	2.6.2	Energy Savings (MWh)	11.73	11.45	11.45	11.45	11.45	57.54
		Summer Demand Reduction (MW)	0.0012	0.0012	0.0012	0.0012	0.0012	0.0060
		Winter Demand Reduction (MW)	0.0020	0.0019	0.0019	0.0019	0.0019	0.0097
		Projected Participation	42	41	41	41	41	206
Weather Stripping, Caulking and Outlet Gaskets - Kit Delivery	2.6.2	Energy Savings (MWh)	57.74	57.74	57.74	57.74	57.74	288.68
		Summer Demand Reduction (MW)	0.0056	0.0056	0.0056	0.0056	0.0056	0.0278
		Winter Demand Reduction (MW)	0.0060	0.0060	0.0060	0.0060	0.0060	0.0299
		Projected Participation	33,000	33,000	33,000	33,000	33,000	165,000
Ceiling/Attic Insulation	2.6.3	Energy Savings (MWh)	10.91	10.91	10.91	10.91	10.91	54.56
		Summer Demand Reduction (MW)	0.0005	0.0005	0.0005	0.0005	0.0005	0.0023
		Winter Demand Reduction (MW)	0.0037	0.0037	0.0037	0.0037	0.0037	0.0187
		Projected Participation	14,800	14,800	14,800	14,800	14,800	74,000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Wall Insulation	2.6.3	Energy Savings (MWh)	11.64	11.64	11.64	11.64	11.64	58.21
		Summer Demand Reduction (MW)	0.0005	0.0005	0.0005	0.0005	0.0005	0.0024
		Winter Demand Reduction (MW)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0199
		Projected Participation	7,200	7,200	7,200	7,200	7,200	36,000
Floor Insulation	2.6.3	Energy Savings (MWh)	11.32	11.32	11.32	11.32	11.32	56.60
		Summer Demand Reduction (MW)	0.0005	0.0005	0.0005	0.0005	0.0005	0.0024
		Winter Demand Reduction (MW)	0.0039	0.0039	0.0039	0.0039	0.0039	0.0194
		Projected Participation	4,700	4,700	4,700	4,700	4,700	23,500
Rim Joist Insulation	2.6.3	Energy Savings (MWh)	4.80	4.80	4.80	4.80	4.80	24.02
		Summer Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0010
		Winter Demand Reduction (MW)	0.0016	0.0016	0.0016	0.0016	0.0016	0.0082
		Projected Participation	1,215	1,215	1,215	1,215	1,215	6,075
Basement or Crawl Space Wall Insulation	2.6.4	Energy Savings (MWh)	3.06	3.06	3.06	3.06	3.06	15.28
		Summer Demand Reduction (MW)	0.0011	0.0011	0.0011	0.0011	0.0011	0.0056
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	3,110	3,110	3,110	3,110	3,110	15,550
ENERGY STAR Windows	2.6.5	Energy Savings (MWh)	0.78	0.78	0.78	0.78	0.78	3.92
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0012
		Projected Participation	300	300	300	300	300	1,500
Home Energy Reports	2.7.3	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	100	100	100	100	100	500
Energy Saving Education	Custom	Energy Savings (MWh)	1,010.00	863.55	863.55	717.10	424.20	3,878.40
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	10,000	8,550	8,550	7,100	4,200	38,400
Health & Safety	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	47	47	47	47	47	235
Energy Education	Custom	Energy Savings (MWh)	101.00	85.85	85.85	70.70	40.40	383.80
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1,000	850	850	700	400	3,800

¹Total values may not equal the sum of all program year values due to rounding.

²Projected participation is based on the unit value for the corresponding measure in Table 31.

Appliance Recycling Component

Description

PPL Electric Utilities will include appliance recycling in the Resource Constrained Energy Efficiency Program, a new offering for income-eligible customers, which is tailored for this customer subset's needs. This component mirrors the Residential Energy Efficiency Program and includes the scheduling, free pick-up, and environmentally responsible recycling of a variety of appliances, including, though not limited to, refrigerators and compact refrigerators, freezers, dehumidifiers, room air conditioners, and other appliances deemed acceptable by the Company. PPL Electric Utilities plans to utilize the same subcontractor or vendor for this component, allowing Resource Constrained Energy Efficiency Program participants to also receive real-time alerts to support the stress-free pickup of their appliances. The disposal process involves removing hazardous materials, such as chlorinated fluorocarbons, from the refrigerant and foam insulation, preparing refrigerant for reclamation, and recycling other materials, including metal and plastic. PPL Electric Utilities reserves the right to set and/or change the program requirements and eligibility, including minimum and maximum appliance sizes, number of units for pickup, and appliance type and condition. PPL Electric Utilities plans to offer curbside and in-home appliance pickup for one or more units, though it may offer other pickup options at its discretion. The Company plans to offer appliance recycling events to which customers may bring eligible appliances for recycling and receive an incentive. Income-eligible customers participating in these events may self-identify as eligible for later verification and contribute to program savings attribution.

Objective and Target Market

The goal of the Appliance Recycling component is to promote the environmentally responsible retirement and/or use of efficient appliances in existing residential end-use buildings with income-eligible customers and/or occupants and to achieve high customer satisfaction and the gross verified energy and coincident peak demand savings goals shown in Table 28. Through the component, the Company intends to promote other PPL Electric Utilities energy efficiency offerings for income-eligible customers, including the appropriate energy assessment offering, encourage participation in other assistance programs such as OnTrack, enhance relationships with retailers selling new appliances in resource-constrained communities, and prevent the resale of units on the secondary market. The Appliance Recycling component of the Resource Constrained Energy Efficiency Program is designed for residential sector customers at or below 150% of the federal poverty level, estimated at 325,000, and commercial and industrial customers that own multifamily buildings that serve income-eligible tenants who may benefit from residential end-use appliance recycling measures.

Ramp-up and Implementation Strategy

Appliance Recycling is an offering with high participation and customer satisfaction, though coordination between CSPs and/or subcontractors and vendors may be necessary to adequately serve income-eligible customers. Implementation activities continued through the end of Phase IV for all residential

customers, and activities will be carried over with new marketing and awareness specific to Resource Constrained Energy Efficiency Program eligible participants to support a successful launch in Phase V. This includes training for technicians performing assessments to recognize recycling opportunities. The Appliance Recycling component will continue to be delivered by the selected Residential Energy Efficiency Program CSP, in coordination with the Resource Constrained Energy Efficiency Program CSP. The CSP(s) will provide a central call center for appointment scheduling and customer support, provide program component marketing and awareness campaigns, process customer incentives, and provide data for the Company's tracking system. The CSP(s) will also coordinate with LIURP to ensure full access to the income-eligible community. PPL Electric Utilities will provide overall strategic direction, administration, and CSP management, while the EM&V CSP will provide evaluation services.

Marketing Strategy

PPL Electric Utilities and current CSPs have deep knowledge of the territory, customer demographics, and potential barriers of the income-eligible segment. The Company will work with the CSP to create a comprehensive, integrated marketing plan that will define the audience, select tactics, employ targeting, and execute campaigns based on industry standards, various research, and historical program data. Successful marketing approaches may include, but will not be limited to, print and email outreach, Company and CSP web assets, social media, outreach to multifamily building owners and operators, community events, retailer outreach and training, outreach to free refrigerator, freezer, or other appliance replacement participants, bill inserts, and/or newsletters. The Company will employ marketing strategies tailored to effectively reach and engage underserved customers and customers of different housing types and, when applicable, encourage cross-program participation.

- **Underserved Customers** – While income-eligible customers could participate in appliance recycling in prior phases, it was not part of the Phase IV Low-Income Program. The marketing strategy will leverage all available information to ensure income-eligible customers' needs are met throughout Phase V and that the component also experiences high participation in income-eligible communities. This includes leveraging Company and CSP segmentation data, publicly available information, and other similar resources.
- **Coordination** – The Company plans to utilize a single CSP, with qualified subcontractors to administer the portfolio of programs, which reduces barriers to coordination and ensures a high level of visibility across all offerings. This will allow cross-program participation where eligibility allows, as well as a clear understanding of coordination impacts. In addition, technicians performing in-home or remote assessments will be trained to identify recycling opportunities while in customer homes, especially those that can be combined with appliance replacement opportunities.
- **Multifamily Buildings** – Multifamily building owners will receive direct outreach and marketing. Coordinated income-eligible multifamily assessment sites will include appliance recycling as an additional opportunity for building owners and operators. These efforts will be coordinated by the CSP's multifamily outreach coordinator.

Issues, Risks, and Risk Management

Table 33 shows risks associated with Appliance Recycling and how the Company intends to mitigate those risks.

Table 33. Appliance Recycling Issues, Risks, and Risk Management Strategies

Component(s) Affected	Issue/Risk	Risk Management Strategies
Appliance Recycling	Customer awareness of an offering in disadvantaged communities.	The Company will work with the selected CSP to create an income-eligible specific marketing plan with messaging appropriate for the community, including bilingual options.

Appliance Recycling Eligible Measures and Incentives

Table 34 shows PPL Electric Utilities' initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. There is no expected cost for customers to participate. All incentive levels are designed to comply with the Pa PUC's plan template and Implementation Order. Measures not available in the TRM will be considered custom measures with an incentive range up to \$200 per unit. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company.

Table 34. Pa PUC TABLE 8 – Resource Constrained Appliance Recycling Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Recycling - Room AC	Per Product	Yes	No	Working unit, no direct replacement	\$15	3	Up to \$100
Recycling - Refrigerator/Freezer	Per Product	Yes	No	Working unit, 10-30 cubic ft	\$35	5	Up to \$200
Recycling - Low-Capacity Refrigerator/Freezer	Per Product	Yes	No	Working unit, ≤ 10 cubic ft	\$15	5	Up to \$100
Recycling - Dehumidifier	Per Product	Yes	No	Working room dehumidifier unit, no direct replacement	\$15	4	Up to \$100

Deadline for Rebate Applications

There is no rebate application for this component.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one FTE, plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include two FTEs. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 35 shows the participation, energy savings, and coincident peak demand reduction estimates for the Appliance Recycling component of the Resource Constrained Energy Efficiency Program. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

**Table 35. Pa PUC Table 9 – Resource Constrained Appliance Recycling
Estimated Savings and Participation**

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Recycling - Room AC	2.2.8	Energy Savings (MWh)	132.62	132.62	132.62	132.62	132.62	663.09
		Summer Demand Reduction (MW)	0.2467	0.2467	0.2467	0.2467	0.2467	1.2335
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation ²	750	750	750	750	750	3,750
Recycling – Refrigerator/ Freezer	2.4.3	Energy Savings (MWh)	408.53	408.53	408.53	408.53	408.53	2,042.64
		Summer Demand Reduction (MW)	0.0604	0.0604	0.0604	0.0604	0.0604	0.3019
		Winter Demand Reduction (MW)	0.0450	0.0450	0.0450	0.0450	0.0450	0.2248
		Projected Participation	570	570	570	570	570	2,850
Recycling - Low-Capacity Refrigerator/ Freezer	2.4.4	Energy Savings (MWh)	9.78	9.78	9.78	9.78	9.78	48.92
		Summer Demand Reduction (MW)	0.0014	0.0014	0.0014	0.0014	0.0014	0.0072
		Winter Demand Reduction (MW)	0.0011	0.0011	0.0011	0.0011	0.0011	0.0054
		Projected Participation	38	38	38	38	38	188
Recycling - Dehumidifier	2.4.12	Energy Savings (MWh)	531.08	531.08	531.08	531.08	531.08	2,655.42
		Summer Demand Reduction (MW)	0.0917	0.0917	0.0917	0.0917	0.0917	0.4584
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	500	500	500	500	500	2,500

¹Total values may not equal the sum of all program year values due to rounding.

²Projected participation is based on the unit value for the corresponding measure in Table 34.

Student Energy Efficiency Education Component

Description

PPL Electric Utilities will include the Student Energy Efficiency Education component for income-eligible customers in Phase V and provide in-class presentations and/or school-based events to educate students and their families about energy safety, use, management, and conservation through hands-on activities, discussions, multimedia, and other materials deemed appropriate by the Company. Where possible, PPL Electric Utilities will align grade-level content with the Pennsylvania State Academic Standards. Students who participate in the presentations or events will receive a package of energy efficiency products to take home and install with the help of a trusted adult. In addition, the Company, with the support of the CSP, may also offer contests and challenges which provide the students and educators with additional opportunities to engage with the material and demonstrate energy efficiency learnings. Participating educators will receive lesson plans, training information, materials, and/or energy efficiency products to help reinforce energy efficiency education before and after the presentations. There are four planned Student Energy Efficiency Education channels, though the Company may choose to expand or contract these channels based on participation:

- **Primary Grade** – Presentations for Students and Educators in grades 2 – 3.
- **Intermediate Grade** – Presentations for Students and Educators in grades 5 – 7.
- **Secondary Grade** – Presentations for Students and Educators in grades 9 – 12.
- **Student Energy Efficiency Events** – This may include participation in school assemblies, Parent Teacher Organization events, Parent Nights, and/or back-to-school events, and local club or sporting events.

Objective and Target Market

The goal of the Student Energy Efficiency Education component is to promote energy efficiency in education settings in disadvantaged communities to inform students about energy efficiency behaviors and activities through enjoyable and interactive presentations utilizing high-quality curricula. This education is designed to be a first step in a longer energy efficiency journey, empowering participants, now and in the future. The informational aspect is supported through energy efficiency measures made available to students and educators that can be used in classrooms and installed at home. All materials, information, and products are designed to achieve high student and educator satisfaction. The Student Energy Efficiency Education component is designed to target residential sector customers at or below 150% of federal poverty, estimated at 325,000, and educators at schools serving the students and families. Since not all schools have 100% income-eligible students, the Company will direct the EM&V CSP to update savings attribution through the estimated percentage of eligible students based on publicly available data.

Ramp-up and Implementation Strategy

The Student Energy Efficiency Education component is a continuation from Phase IV, though is being expanded to income-eligible customers in Phase V. The selected CSP will work closely with the Residential Energy Efficiency Program CSP to implement the component and provide marketing in conjunction with the Company, provide school recruitment, curriculum development, on-site presentations and event management, while also providing any take-home materials and energy efficiency products. The Residential Energy Efficiency CSP will provide a call center and support services for educators and administrators on behalf of the Resource Constrained Energy Efficiency Program and provide data for the Company's tracking system. PPL Electric Utilities will provide overall strategic direction, administration, and CSP management, while the EM&V CSP will provide evaluation services.

Marketing Strategy

The Company and CSP will create a marketing strategy for potential schools and districts designed to promote the empowerment of students as energy leaders at school and at home. The selected Residential Energy Efficiency Program CSP will promote the program to a list of qualified PPL Electric Utilities' territory schools through awareness materials and marketing efforts to participants primarily through email and direct mail. The messaging will emphasize interactive learning, community impact, and engaging classroom activities. Whenever possible, the most at-risk and disadvantaged communities will be prioritized. The Company will employ marketing strategies tailored to effectively reach and engage underserved customers and customers of different housing types and, when applicable, encourage cross-program participation.

- **Underserved Customers** – While the residential version of the component included income-eligible communities in prior phases, this offering will be more targeted and focused on this customer subset's specific needs. Schools will be identified using publicly available data, providing insight into districts that have a majority of households at or below 150% of the federal poverty level. Opportunities for further participation in other Resource Constrained offerings, particularly the Single Family and Multifamily Assessment channels, will be featured in student printed materials.
- **Multifamily Buildings** – This program component is not contingent on housing type; students of both homeowners and tenants in all housing types are eligible. Communication and marketing are school-focused, not customer-dependent.
- **Coordination** – The Company plans to utilize a single CSP, with qualified subcontractors to administer the portfolio of programs, which reduces barriers to coordination and ensures a high level of visibility across all offerings. This will allow cross-program participation where eligibility allows, as well as a clear understanding of coordination impacts.

Issues, Risks, and Risk Management

Table 36 shows risks associated with Student Energy Efficiency Education and how the Company intends to mitigate those risks.

Table 36. Student Energy Efficiency Issues, Risks, and Risk Management Strategies

Component(s) Affected	Issue/Risk	Risk Management Strategies
Student Energy Efficiency	Identification of and engagement with disadvantaged communities.	The Company has developed a comprehensive Income-Eligible Needs Assessment Dashboard that allows for meter-level identification of likely eligible homes, communities, and neighborhoods. This tool will be shared with the selected CSP for proper targeting of eligible schools.

Student Energy Efficiency Education Eligible Measures and Incentives

Table 37 shows PPL Electric Utilities’ initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. There is no expected cost for customers to participate. All incentive levels are designed to comply with the Pa PUC’s plan template and Implementation Order. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company. There is no cost for students or educators to participate in this program component. In addition, all measures available to customers may be delivered via any available channel to meet the customer’s unique needs.

**Table 37. Pa PUC TABLE 8 – Resource Constrained Student Energy Efficiency Education
Eligible Measures**

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
LED Lighting - GSL	Per Bulb	Yes	No	LED	\$4	15	100% of Measure Cost
Nightlight	Per Product	Yes	No	LED	\$2	8	100% of Measure Cost
Air Handler Filter Whistles	Per Product	Yes	No	Applied to central forced-air furnaces, CAC, or heat pump systems	\$2	5	100% of Measure Cost
Water Heater Temperature Setback	Per Product	Yes	No	Electric water heater where applicable	\$1	2	100% of Measure Cost
Low-Flow Faucet Aerator	Per Product	Yes	No	≤ 1.5 GPM flow rate, homes with electric water heater where applicable	\$2	10	100% of Measure Cost
Low-Flow Showerhead	Per Product	Yes	No	Replaces standard showerhead, homes with electric water heater where applicable	\$5	10	100% of Measure Cost
Advanced Power Strips	Per Product	Yes	No	Tier 1 or Tier 2	\$19	5	100% of Measure Cost

Deadline for Rebate Applications

There is no rebate application for this component.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include one FTE plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include one FTE. As a component of a larger program, FTEs may be fractional depending on the delegation of responsibilities.

Estimated Savings and Participation

Table 38 shows the participation, energy savings, and coincident peak demand estimates for the Student Energy Efficiency program component. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the component to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

**Table 38. Pa PUC Table 9 – Resource Constrained Student Energy Efficiency Education
Estimated Savings and Participation**

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
LED Lighting - GSL	2.1.1	Energy Savings (MWh)	277.57	277.57	331.47	331.47	331.47	1,549.55
		Summer Demand Reduction (MW)	0.0328	0.0328	0.0392	0.0392	0.0392	0.1832
		Winter Demand Reduction (MW)	0.0328	0.0328	0.0392	0.0392	0.0392	0.1832
		Projected Participation ²	17,100	17,100	19,950	19,950	19,950	94,050
Nightlight	2.1.3	Energy Savings (MWh)	18.59	18.59	21.69	21.69	21.69	102.27
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	4,500	4,500	5,250	5,250	5,250	24,750
Air Handler Filter Whistles	2.2.11	Energy Savings (MWh)	28.05	28.05	32.72	32.72	32.72	154.25
		Summer Demand Reduction (MW)	0.0067	0.0067	0.0078	0.0078	0.0078	0.0370
		Winter Demand Reduction (MW)	0.0072	0.0072	0.0084	0.0084	0.0084	0.0396
		Projected Participation	4,200	4,200	4,900	4,900	4,900	23,100
Water Heater Temperature Setback	2.3.4	Energy Savings (MWh)	460.67	460.67	537.45	537.45	537.45	2,533.70
		Summer Demand Reduction (MW)	0.0491	0.0491	0.0572	0.0572	0.0572	0.2698
		Winter Demand Reduction (MW)	0.0819	0.0819	0.0955	0.0955	0.0955	0.4504
		Projected Participation	4,200	4,200	4,900	4,900	4,900	23,100

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Low-Flow Faucet Aerator	2.3.6	Energy Savings (MWh)	56.09	56.09	65.44	65.44	65.44	308.51
		Summer Demand Reduction (MW)	0.0261	0.0261	0.0304	0.0304	0.0304	0.1435
		Winter Demand Reduction (MW)	0.0747	0.0747	0.0871	0.0871	0.0871	0.4106
		Projected Participation	5,400	5,400	6,300	6,300	6,300	29,700
Low-Flow Showerhead	2.3.7	Energy Savings (MWh)	163.52	163.52	190.77	190.77	190.77	899.34
		Summer Demand Reduction (MW)	0.0173	0.0173	0.0202	0.0202	0.0202	0.0951
		Winter Demand Reduction (MW)	0.0290	0.0290	0.0339	0.0339	0.0339	0.1596
		Projected Participation	4,200	4,200	4,900	4,900	4,900	23,100
Advanced Power Strips	2.5.1	Energy Savings (MWh)	378.51	378.51	441.59	441.59	441.59	2,081.78
		Summer Demand Reduction (MW)	0.0422	0.0422	0.0492	0.0492	0.0492	0.2321
		Winter Demand Reduction (MW)	0.0580	0.0580	0.0677	0.0677	0.0677	0.3192
		Projected Participation	5,700	5,700	6,650	6,650	6,650	31,350

¹Total values may not equal the sum of all program year values due to rounding.

² Projected participation is based on the unit value for the corresponding measure in Table 37.

Resource Constrained Pilot Programs

Description

PPL Electric Utilities may work with the selected EM&V CSP to develop a Window Saddle Heat Pump Pilot program for multifamily tenants to examine the savings potential and benefit to customers in Act 129 energy efficiency programs. This pilot will not require further future approval by SWE or Commission staff, though stakeholder notification will be provided via a PPL Electric Utilities biannual stakeholder meeting prior to launch. If C&I customers receive benefits based on the building type and meter configuration, those savings and associated costs will be properly attributed to the correct sector. A key research question is whether this nascent technology can effectively replace baseboard resistance heat in multifamily applications. Metrics to be tracked include product performance, customer response, and avoided electric demand and energy savings impacts. If launched, the EM&V CSP will submit an evaluation plan to the Phase V SWE for approval. The initial pilot may span 24 months and have a budget of up to \$1 million. The Company will issue a final report at the conclusion of the potential pilot, and the EM&V CSP will provide evaluation results as part of the annual reporting process. PPL Electric Utilities may choose to continue the program without the submission of an EE&C plan change with contingency funding if it is determined that the program provides a benefit to customers and/or helps the Company meet compliance targets.

PPL Electric Utilities reserves the right to propose additional pilots as deemed necessary by the Company to demonstrate new technology, methods, program design, or for any other reason, utilizing allocated contingency funding. All proposed pilots will be filed with the Commission for review, as is outlined in the Final Implementation Order.

3.4. Small and Large Commercial and Industrial (Business Energy Efficiency Program)

While the Pa PUC separated the C&I sector into small (Pa PUC Plan V Template Section 3.3) and large (Pa PUC Plan V Template Section 3.4) in the plan template, PPL Electric Utilities' Plan has only the Business Energy Efficiency Program, which is eligible to both small and large industrial customers. Section 3.4 in this report contains all information for both applicable sectors.

PPL Electric Utilities' Business Energy Efficiency Program is an umbrella program with components that will be available for the entirety of Phase V, from 2026 through 2031. The Business Energy Efficiency Program includes measures and services for all large and small C&I customers. The small C&I component of the program includes agricultural measures for small farms, which may fall into the residential customer sector. Table 39 and Table 40 show the percentages of the customer sector budgets represented by the small and large C&I components of the Business Energy Efficiency Program.

Table 39. Percentages of Customer Sector Budgets Represented by the Small C&I Component of the Business Energy Efficiency Program

Customer Sector	Percentage of Sector Budget
Residential	0.3%
Resource Constrained	0%
Small C&I	97.4%
Large C&I	0%

Table 40. Percentages of Customer Sector Budgets Represented by the Large C&I Component of the Business Energy Efficiency Program

Customer Sector	Percentage of Sector Budget
Residential	0%
Resource Constrained	0%
Small C&I	0%
Large C&I	100%

The Business Energy Efficiency Program has a cost-effective TRC, as found in Table 56 in Section 8. The Business Energy Efficiency Program includes the following components:

- Small C&I Business Solutions (Table 41)
- Large C&I Business Solutions (Table 42)

Table 41. Small C&I Business Solutions Component Savings by Program Year

Component	Metric	PY18	PY19	PY20	PY21	PY22	Total Phase V ¹	% of Program
Small C&I	Energy Savings (MWh)	96,714	116,741	112,469	97,527	75,163	498,615	100%
	Summer Demand Reduction (MW)	18.65	25.38	26.61	17.58	12.83	93.56	100%
	Winter Demand Reduction (MW)	10.16	16.58	18.13	11.26	9.27	57.90	100%
	Average Demand Reduction (MW)	14.40	20.98	22.37	14.42	11.05	75.73	100%

¹ Total values may not equal the sum of all program year or component values due to rounding.

Table 42. Large C&I Business Solutions Component Savings by Program Year

Component	Metric	PY18	PY19	PY20	PY21	PY22	Total Phase V ¹	% of Program
Large C&I	Energy Savings (MWh)	50,422	65,955	74,729	72,806	57,223	321,135	100%

Component	Metric	PY18	PY19	PY20	PY21	PY22	Total Phase V ¹	% of Program
	Summer Demand Reduction (MW)	9.65	12.21	18.47	18.35	9.94	61.12	100%
	Winter Demand Reduction (MW)	5.98	7.93	12.28	14.75	7.40	40.84	100%
	Average Demand Reduction (MW)	7.82	10.07	15.37	16.55	8.67	50.98	100%

¹ Total values may not equal the sum of all program year or component values due to rounding.

Program and Component Operations and Administration

The selected Business Energy Efficiency Program CSP will provide operational management, administrative support, and implementation activities, while PPL Electric Utilities EE&C staff will provide oversight and administration of all programs and components.

Estimated Program Budgets

Table 37 and Table 44 show the estimated budget by year for the Small and Large C&I Business Solutions components of the business Energy Efficiency Program, divided by incentive and non-incentive costs.

Table 43. Pa PUC Table 10 – Small C&I Business Solutions Component Budget by Year

Cost Element		PY18	PY19	PY20	PY21	PY22	Phase V Total
Total Budget (\$000)		\$17,270	\$20,089	\$19,740	\$17,649	\$14,571	\$89,320
Incentives (\$000)²	Rebates	\$8,298	\$9,784	\$9,449	\$8,055	\$6,300	\$41,886
	Upstream/ Midstream Buydown	\$1,652	\$1,717	\$1,683	\$1,588	\$1,414	\$8,053
	Kits	\$0	\$0	\$0	\$0	\$0	\$0
	Direct Install Materials & Labor	\$304	\$861	\$959	\$980	\$772	\$3,876
	Incentive Total	\$10,254	\$12,362	\$12,091	\$10,622	\$8,486	\$53,815
Non-Incentives (\$000)³	Program Design	\$323	\$362	\$359	\$331	\$286	\$1,661
	Administrative	\$2,282	\$2,451	\$2,428	\$2,259	\$2,000	\$11,421
	EDC Delivery Costs	\$261	\$280	\$277	\$258	\$228	\$1,304
	CSP Delivery Fees	\$2,800	\$3,081	\$3,051	\$2,803	\$2,426	\$14,160
	Marketing	\$915	\$1,045	\$1,029	\$922	\$766	\$4,677
	Other ⁴	\$435	\$509	\$504	\$455	\$379	\$2,283
	Non-Incentive Total	\$7,016	\$7,728	\$7,649	\$7,027	\$6,085	\$35,505
Percent Incentives		59%	62%	61%	60%	58%	60%

Cost Element	PY18	PY19	PY20	PY21	PY22	Phase V Total

¹ Total values may not equal the sum of all program year values due to rounding.

² Braided Funding Support Labor costs are not included in this table because they are estimated to be \$0.

³ EM&V and AEPS Registration Support Costs are not included in this table because AEPS Registration Support Costs are estimated to be \$0 and EM&V costs are included as portfolio costs.

⁴ Indirect CSP Delivery Costs, e.g., fleet vehicles, subscriptions, IT.

Table 44. Pa PUC Table 10 – Large C&I Business Solutions Component Budget by Year

Cost Element		PY18	PY19	PY20	PY21	PY22	Phase V Total ¹
Total Budget (\$000)		\$9,800	\$12,027	\$13,420	\$12,855	\$10,497	\$58,598
Incentives (\$000)²	Rebates	\$4,029	\$5,321	\$6,053	\$6,004	\$4,443	\$25,850
	Upstream/ Midstream Buydown	\$1,071	\$1,061	\$1,043	\$994	\$921	\$5,090
	Kits	\$0	\$0	\$0	\$0	\$0	\$0
	Direct Install Materials & Labor	\$254	\$393	\$527	\$441	\$345	\$1,960
	Incentive Total	\$5,354	\$6,775	\$7,623	\$7,439	\$5,710	\$32,901
Non-Incentives (\$000)³	Program Design	\$221	\$271	\$300	\$271	\$241	\$1,305
	Administrative	\$1,372	\$1,586	\$1,723	\$1,607	\$1,452	\$7,740
	EDC Delivery Costs	\$189	\$218	\$237	\$221	\$200	\$1,064
	CSP Delivery Fees	\$1,662	\$1,965	\$2,181	\$2,052	\$1,814	\$9,675
	Marketing	\$650	\$792	\$887	\$820	\$696	\$3,844
	Other ⁴	\$351	\$419	\$469	\$445	\$385	\$2,069
	Non-Incentive Total	\$4,446	\$5,252	\$5,797	\$5,416	\$4,787	\$25,698
Percent Incentives		55%	56%	57%	58%	54%	56%

¹ Total values may not equal the sum of all program year values due to rounding.

² Braided Funding Support Labor costs are not included in this table because they are estimated to be \$0.

³ EM&V and AEPS Registration Support Costs are not included in this table because AEPS Registration Support Costs are estimated to be \$0 and EM&V costs are included as portfolio costs.

⁴ Indirect CSP Delivery Costs, e.g., fleet vehicles, subscriptions, IT.

Schedule and Milestones for Program and All Components

For all program components, the schedule and milestones include submission of the Company's EE&C Plan on December 1, 2025, launch of Phase V on June 1, 2026, semi-annual reports submitted annually starting on January 15, 2027, annual reports submitted annually starting on September 30, 2027, and the end of all components at the end of the phase on May 31, 2031.

Program and Component EM&V

All EM&V requirements for all program components will be detailed in PPL Electric Utilities' evaluation plan, submitted to SWE for review. The Company and third-party EM&V CSP will conduct an evaluation on an annual basis for each program and component to verify savings and establish other key performance indicators, such as incentive costs, administrative costs, and participation. The EM&V CSP will follow all applicable methods in the TRM and the Evaluation Framework to calculate energy savings and coincident peak demand reduction. PPL Electric Utilities' impact and process evaluation activities will vary by year and program component and/or channel.

Small and Large C&I Business Solutions Components

Description

PPL Electric Utilities' Small and Large C&I Business Solutions components provide education and technical assistance for all business types in our service territory, financial incentives to drive energy efficiency market transformation and offset project costs, while providing verified savings for a wide variety of measures in new and existing facilities. Available measures may include, but are not limited to, HVAC, refrigeration, solar, controls, lighting, appliances, motors and drives, CHP, compressed air, and more. Comprehensive measures are defined by the Pa PUC's plan template for residential measures and the Company has followed a similar methodology in determining comprehensiveness for C&I; both components include a variety of comprehensive measures across available channels. There are four primary delivery channels within both the Small and Large C&I Business Solutions components. Except where otherwise noted, the offerings and participation channels are the same for both components. These include the following:

- **Downstream** – PPL Electric Utilities will provide end-use level, or downstream, incentives for business customers. This includes prescriptive measures as found in the Pa TRM. The CSP will review, process, and validate all submitted applications, follow up as necessary, and distribute incentives upon project completion and final savings calculations.
- **Custom Measures** – PPL Electric Utilities will continue to offer incentives to customers and trade allies for complex and comprehensive projects generally not found in the Pa TRM. This pathway encourages customers to utilize advanced, innovative, and impactful measures, processes, and optimizations. Available measures may include, but are not limited to, CHP, advanced controls, compressed air, and other projects deemed necessary by the Company.
- **Direct Discount** – The Direct Discount channel, available exclusively to small commercial and industrial customers, allows qualified trade allies to provide lower project costs for customers through an incentive paid directly to the trade ally. Trade allies will identify opportunities, provide project management, and apply for available incentives on the customer's behalf to offset upfront project costs. Customers who utilize PPL Electric Utilities' closed network of Direct Discount trade allies, created and maintained by the selected CSP, may be eligible for higher incentives, while trade allies may receive additional technical support and training.

- **Midstream** – PPL Electric Utilities will offer a comprehensive midstream channel with a variety of available products, providing incentives to distributors rather than customers, to reduce program participation barriers through quick access to efficient products. Midstream offerings drive market transformation by aligning the incentive with the supply chain. Midstream rebates also simplify the process for customers and trade allies by embedding the rebate at the point of sale. The Company and selected CSP will engage and qualify distributors for participation and ensure they stock, promote, and provide high-efficiency technology options to participating contractors with an immediate rebate. The midstream offering increases trade ally participation and customer satisfaction, while reducing administrative costs and participant confusion.
- **Business Support Services** – Business Support Services is a new offering in Phase V dedicated to supporting the business community and ensuring high participation for as many industries and sectors as possible. This is accomplished through a strong focus on relationship building and providing customers with energy consumption and strategic insights by industry experts. Business Support Services are structured in tiers according to customer need:
 - *Basic Engineering Support*– Customers can access direct application support to reduce administrative burden, receive site visits to help determine measure and rebate opportunities, and ongoing technical support for customers and trade allies.
 - *Deep Engineering Support*
 - *Feasibility Studies* – The selected CSP will provide enhanced engineering support in the early development stages of a project; this may include feasibility studies for businesses that cannot undertake this effort without support.
 - *Virtual Commissioning* – The Company may leverage virtual commissioning via remote diagnostics and advanced analytics to optimize building systems without always requiring onsite visits. This provides a cost-effective option for business customers to identify and implement operational improvements to extend equipment life and realize energy savings with minimal disruption to daily activities.
- **Customer Training and Certifications** – PPL Electric Utilities will provide meaningful education and training for trade allies and customers, such as the Building Operator Certification offered in partnership with Penn College in Phase IV. This certification will build in-house expertise so customers can identify and implement energy-saving measures, taking advantage of all available rebates. Trained staff can also optimize equipment to balance long-term savings and performance. The Company is dedicated to helping businesses stay competitive in a rapidly evolving energy landscape.
- **Strategic Energy Management (“SEM”)** – Customers with complex energy usage, such as hospitals, data centers, and manufacturing plants and that have interest in long-term energy solutions can take advantage of SEM support that braids all areas of Business Support Services and available rebates into an integrated behavioral, operational, and overarching energy management strategy that may include all elements within the Business Support Services

channel. PPL Electric Utilities' SEM channel will be tailored to each customer's needs, though it may be delivered over 12 to 24 months and include site assessment, technical support, employee engagement and training, goal setting and tracking, and project planning.

Objective and Target Market

The goal of the Small and Large C&I Business Solutions components is to promote qualifying high-efficiency equipment and technology installations, equipment repair, systems optimization, and operational or process changes that reduce both energy consumption and coincident peak demand across a variety of commercial and industrial end uses, facility types, and building designs. The target market is approximately 300,000 business customers, regardless of industry and sector, as well as residential customers (e.g., those who own farms), and may benefit from business energy efficiency rebates. Through cross-promotion, education, and technical assistance, PPL Electric Utilities will increase awareness of the benefits of energy efficiency for all business customers. In addition, through the custom pathway in the Downstream channel, the Company will also support emerging technology and create program flexibility throughout Phase V. These activities are designed to achieve the gross verified energy and coincident peak demand savings forecasts shown in Table 41 and Table 42.

Ramp-up and Implementation Strategy

Most component channels existed in Phase IV and will be carried over to Phase V, though a robust transitional strategy for managing differences in eligibility, incentive levels, and overall awareness is planned. The Company does not expect to carry a waitlist from Phase IV, though there are projects that have received approval in Phase IV that will not be completed by the end of the phase. PPL Electric Utilities will allow projects started in the prior phase to receive either the Phase IV or Phase V incentive level, whichever is higher. The implementation strategy for the components is dependent on the channel, though it relies on a robust network of trusted trade allies, distributor partners, and other market actors to act as program ambassadors and drive high customer uptake. The selected CSP will provide enhanced customer support through digital tools, such as a web portal for application submission, energy savings calculators, and other online resources:

- **Downstream** – PPL Electric Utilities will coordinate marketing activities with the selected CSP to build awareness and drive customers and trade allies to complete applications or provide direct application support for eligible measures. This includes ensuring the required documentation and data, if necessary, are provided, per the approved EM&V framework. Rebates, in the form of a check or other approved method, will be provided to customers once requirements for each particular measure or project are met.
- **Direct Discount** – The selected CSP will recruit, develop, train, and manage the closed network of trade allies in key technology areas for this channel. The trade allies will be responsible for co-marketing the program and providing overall project management for each customer. All available incentives provided by the Company will be communicated to the customer at the invoice level, with customers covering the remainder of the costs. Trade allies will be educated on how incentives can help improve their close rates and differentiate them from competitors.

Trade allies will be provided active sales and ready-to-use marketing support, as well as public recognition opportunities and potential incentives for performance.

- **Midstream** – The Company and selected CSP will leverage the existing distributor network, expanding it through market research to identify key product categories, sales volume, and those with regional market influence. Distributors will provide point-of-purchase instant discounts while submitting for reimbursement directly with the CSP. Participating distributors will be educated on how the program may boost sales and customer satisfaction. They may be provided with incentives to align with the program’s distributor model, and will be provided with a quick, easy-to-understand enrollment process.
- **Business Support Services** – PPL Electric Utilities will take a phased, customer-centric approach focused on value delivery and strategic partnerships. The Company has identified high-potential business sectors and their common technical and operational barriers to energy efficiency. Support services will be packaged according to customer needs in tiers—basic support, deep technical support, and strategic energy management, with a single point of entry. This will align the offerings with customer size, level of sophistication, and organizational goals. The selected CSP will provide specialized expertise at scale and promote how the service can reduce project risk and position customers for a variety of incentives.

Marketing Strategy

PPL Electric Utilities and current CSPs have successfully reached business customers across multiple phases of Act 129 and have undertaken significant research efforts to prepare for Phase V. This includes direct customer and trade ally input and preferences, barriers to participation, and effective marketing approaches. The Company will collaborate with the selected CSP to create a sector and industry-specific marketing plan that will define the audience, select tactics, employ targeting, and execute campaigns based on industry standards, key internal and external research, and historical program data. There will be a continual focus on sectors with high unrealized energy savings potential as well as underserved customer segments. The marketing strategy will also feature these additional areas of focus:

- **Channels and Tactics** – PPL Electric Utilities' overall marketing approach will promote the program through a variety of mass media channels, which may include but are not limited to newspapers, radio, direct mail, bill inserts, and digital advertising. The Company will also communicate program information via the Company’s EE&C website, CSP website(s), newsletters, case studies, and co-branded marketing materials. This effort will be supported by hosting webinars and participating in trade shows, industry conferences, and other outreach events to increase visibility and awareness. The CSP will utilize marketing campaigns targeted at specific customer segments and industry, personalized to the business and industry whenever possible.
- **Market Actor and Partner Engagement** – The Company and selected CSP will leverage relationships with trade allies, manufacturers, distributors, and key market partners (e.g., trade associations, agencies) to co-market energy-efficient products and services. This includes

coordinating advertising opportunities and program messaging with trade allies and distributors. The Company will publish and distribute brochures, technical guides, and case studies to support customer decision-making. As noted elsewhere, trade allies and distributors may be eligible for rewards, incentives, and recognition programs to enhance participation and performance.

- **Targeted Marketing** – The selected CSP will develop targeted campaigns for facility managers, engineers, contractors, building owners, property managers, and tenant decision-makers. They may also conduct one-on-one marketing and consulting with small and mid-sized commercial customers through CSP outreach and trade allies. PPL Electric Utilities’ key account managers will continue to play an important role in supporting energy efficiency messaging for large C&I customers, while the Business Account Services team will support messaging to small C&I customers. Finally, limited-time offers, special promotions, and leveraging our Business Support Services will ensure customer awareness and additional program uptake.
- **Underserved Customers** – The Company will offer a variety of business support services, including financing, that will support business customers, particularly small business customers, with administrative burdens to participation, technical resources, and access to financial resources that will allow access to incentives and rebates in a way not previously possible.
- **Coordination** – The Company plans to utilize a single CSP, with qualified subcontractors to administer the portfolio of programs, which reduces barriers to coordination and ensures a high level of visibility across all offerings. This will allow cross-program participation where eligibility allows, as well as a clear understanding of coordination impacts.
- **Multifamily Buildings** – As an area of focus, the Company will coordinate with other portfolio components that treat in-unit multifamily customers, sharing leads and developing total building site strategies that allow multifamily building owners to take advantage of Business Energy Efficiency Program incentives for common spaces.

Issues, Risks, and Risk Management

Table 45 shows risks associated with the Small and Large Commercial Business Solutions components and how the Company intends to mitigate those risks.

Table 45. Small and Large C&I Business Solutions Issues, Risks, and Risk Management Strategies

Delivery Channels Affected	Issue/Risk	Risk Management Strategies
Downstream, Midstream, Direct Discount	Internal research indicates that budget constraints are the top barrier among both participants and non-participants.	The Company and CSP may tailor incentives by measure and sector, with a plan to keep levels consistent to ensure steady customer participation.
Downstream, Midstream, Direct Discount	PPL Electric Utilities’ research indicates that over half of non-	In non-participant outreach, the CSP will use a variety of channels to share participant success stories that address non-participant barriers like

Delivery Channels Affected	Issue/Risk	Risk Management Strategies
	participants (54%) haven't made EE improvements, often due to a lack of awareness	lack of time and resources, while emphasizing energy savings and ease of participation. The Company will also use an online interest form that allows businesses to request contact, allowing proactive follow-up from appropriate personnel.
Downstream, Midstream, Direct Discount, Business Support Services	Market actors indicated confusion around product codes, eligible equipment, program updates, and other important application issues.	The Company and CSP will make program newsletters more visible and easier to find for those not subscribed. The submission portal will be reviewed for updates. The CSP will hold additional live webinars focused on program changes and best practices with a Q&A section.

Small and Large C&I Business Solutions Eligible Measures and Incentives

Table 46 and Table 47 show PPL Electric Utilities' initial measures, eligibility qualifications, incentive level ranges, incremental costs, and estimated useful life. The cost to participating customers is the incremental cost minus the incentive amount. Incentives were determined based on the service or product incremental cost and the most cost-effective incentive range to ensure customer participation. Not all measures may be available at all times and the Company may remove measures, change eligibility, application process and administrative requirements, adjust incentive levels and/or tiers, or other aspects of the program and/or component due to savings achieved, costs, evaluation requirements and/or issues, customer feedback, Company priorities, or for any other reason, as determined by the Company. In addition, all measures available to customers may be delivered via any available channel to meet the customer's unique needs. Customers will have the option to assign rebate payments to a third party. All incentive levels are designed to comply with the Pa PUC's Implementation Order. The Company may cap incentives on a per-project basis as a percentage of total project costs, excluding internal labor, or based on an annual cap by project or participating customer. This may include a parent company cap for organizations with a campus setting or a common owner with multiple buildings. PPL Electric Utilities may also implement a minimum TRC requirement for qualifying measures if it is determined to be necessary for program and/or portfolio success. For any proposed changes to the program, component, or measures as noted above, the Company will strive to provide 30-day notification, though it reserves the right to make immediate changes based on the Company's discretion.

Table 46. Pa PUC TABLE 8 – Small C&I Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Lighting Retrofits	Per Product	No	No	LED fixtures and lamps replacing less efficient lighting in existing commercial or industrial facilities. Screw-based integrated LED lamps are not eligible	\$2,693	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
New Construction Lighting	Per Project	No	No	New construction, ≥ 45 lumens/watt	\$532,614	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Lighting Controls	Per Product	No	No	Automatically adjusts lighting levels based on schedule or sensor	\$775	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
LED Exit Signs	Per Product	No	No	Early replacement from incandescent or fluorescent to LED	\$69	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
LED Refrigeration Display Case Lighting	Per Door	No	No	Retrofit on existing refrigerator, freezer, or cooler	\$11	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Midstream Lighting	Per Product	No	No	LED fixtures and lamps replacing less efficient lighting in existing commercial or industrial facilities. Screw-based integrated LED lamps are not eligible	\$713	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Indoor Horticultural Lighting	Per Project	No	No	Design Lights Consortium (DLC) Horticultural Technical Requirements V3.0 or later	\$169,458	7	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
ASHP and Air Source AC	Per Product	No	Yes	Comfort heating and/or cooling end use	\$18,658	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ASHP and Air Source AC - Midstream	Per Product	No	Yes	Comfort heating and/or cooling end use	\$18,658	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Electric Chiller	Per Product	No	Yes	Standard comfort cooling applications, defined as unitary electric chillers serving a single load at the system or sub-system level	\$76,816	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ground or Groundwater Source Heat Pump	Per Product	No	Yes	Exceeds energy efficiency requirements of the International Energy Conservation Code (IECC) 2021	\$10,985	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ductless Mini-Split Heat Pump	Per Product	No	Yes	Cold Climate, ENERGY STAR Version 6.1	\$1,516	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Midstream Mini-Split Heat Pump	Per Product	No	Yes	Cold Climate, ENERGY STAR Version 6.1	\$1,516	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Small C&I HVAC Refrigerant Charge Correction	Per Product	No	Yes	Documented tune-ups for package or split systems up to 20 tons, small C&I customers	\$33	3	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
HVAC Tune Up	Per Project	No	No	Documented tune-ups for air conditioners and heat pumps operating in commercial applications up to 20 tons	\$7,538	3	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Room Air Conditioner	Per Product	No	No	Efficiency exceeds the minimum level as required by the federal standards effective May 26, 2026	\$124	9	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
HVAC Controls: Guest Room Occupancy Sensor	Per Product	No	No	Automatically adjusts the temperature setback in hotel guest rooms during unoccupied periods	\$208	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
HVAC Controls: Economizer	Per SQFT	No	Yes	Dual enthalpy economizers on HVAC equipment in commercial applications	\$0.05	3	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Computer Room Air Conditioner	Per Product	No	Yes	Exceed TRM baseline efficiencies	\$904	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Electronically Commutated Plug Fans on Computer Room Air Conditioner/Handler	Per HP	No	No	Electronically Commutated Plug Fan	\$277	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
VSD on Computer Room Air Conditioner or Handler Fan Motor	Per HP	No	Yes	New construction or retrofit	\$340	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Circulation Fan: High-Volume Low-Speed	Per Product	No	Yes	8 to 24 ft diameter, commercial and industrial applications	\$4,074	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Demand Controlled Ventilation	Per SQFT	No	Yes	Commercial and institutional applications, retrofit on HVAC systems without economizers installed	\$2	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Advanced Rooftop Controls	Per Product	No	Yes	Commercial and institutional applications in buildings served by single-zone packaged HVAC units that include functional integrated economizers	\$3,146	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Connected Thermostat	Per Product	No	No	ENERGY STAR	\$76	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Adjustment to Programmable Thermostats	Per Product	No	No	Adjustment align HVAC operation with building occupancy	\$0	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Duct Sealing And Insulation	Per Product	No	Yes	Retrofit only, HVAC supply ducts passing through an unconditioned space	\$10,860	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Chilled Water Pipe Insulation	Per Foot	No	No	Electric chiller, retrofit, ≥ 1 inch of insulation	\$10	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Premium Efficiency Motors	Per HP	No	Yes	Replacement of old motors with new energy efficient motors of the same rated HP	\$197	15	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
VFD Improvements	Per Product	No	Yes	A motor with a VFD control replacing a motor without a VFD control	\$2,067	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ECM Circulating Fan	Per Product	No	Yes	Circulating fan motors of 1 HP or less, retrofit for air handling equipment with an SP or PSC fan motor	\$319	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
VSD on Kitchen Exhaust Fan	Per HP	No	No	Kitchen ventilation system with VSD and demand ventilation controls and sensors	\$1,069	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ECM Circulator Pump	Per Product	No	Yes	An ECM or BPM circulator pump replacing single-speed induction motor circulator pumps in space heating and hot water applications.	\$66	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Efficiency Pumps	Per Product	No	Yes	Compliant pumps will achieve a PEI of 1.0 or less. All pumps manufactured after January 27, 2020 must comply with the DOE's energy conservation standard as described in 10 CFR 431 Subpart Y	\$142	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Heat Pump Water Heaters	Per Product	No	Yes	ENERGY STAR	\$1,204	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Low Flow Pre-Rinse Spray Valves	Per Product	No	No	Electric water heater, maximum GPM varies by product class	\$662	8	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
Domestic Hot Water Pipe Insulation	Per Project	No	No	Uninsulated electric DHW piping in non-residential facility with looped system and operational circulation pump, ≥ 1 inch of insulation that complies with the IECC specifications	\$4	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Freezer Case	Per Product	No	No	ENERGY STAR	\$750	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Efficiency Evaporator Fan Motors for Walk-in or Reach-in Cases	Per Product	No	Yes	Replacement of existing SP evaporator fan motors or PSC motors in walk-in or reach-in refrigerated display cases with an ECM or a PMS motor	\$429	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Evaporator Fan Controllers	Per Product	No	Yes	Installed in medium-temperature walk-in or reach-in coolers or low temperature walk-in or reach-in freezers	\$162	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Floating Head Pressure Control	Per HP	No	Yes	Applied to a single-compressor refrigeration system with FHPC in commercial applications. FHPCs must have a minimum Saturated Condensing Temperature programmed for the floating head pressure control of ≤70 °F. Compressor must be 1 HP or larger.	\$431	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Anti-Sweat Heater Control	Per Product	No	Yes	Added to glass door cooler or refrigerator with uncontrolled heaters utilizing either ON/OFF or micro pulse controls	\$831	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Evaporator Coil Defrost Control	Per Product	No	Yes	Added to existing walk-in coolers or freezers without defrost controls	\$987	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Variable Speed Refrigeration Compressor	Per HP	No	Yes	Replaces a slide valve control system in an existing commercial refrigeration system	\$1,951	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Strip Curtains for Walk-in Cooler or Freezer	Per Product	No	No	Install or retrofit strip curtains in commercial walk-in cooler and freezer doors. Strip curtains must be at least 0.06 inches thick	\$5,193	4	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Night Covers for Display Cases	Per Product	No	No	Installed on existing open-type refrigerated display cases, where covers are deployed during the facility's unoccupied hours	\$72	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Auto Closer for Cooler or Freezer	Per Product	No	No	Installed for walk-in freezer or cooler, door perimeter ≥ 16 feet	\$573	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Door with Low or No Anti-Sweat Heat for Reach-In Cooler or Freezer	Per Product	No	No	Upright display case door ≥ 57 inches tall, no-heat/low-heat clear glass door with heat reflective treated glass, be gas filled, or both	\$697	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Suction Pipe Insulation for Walk-In Cooler or Freezer	Per Foot	No	No	Must insulate bare refrigeration suction lines $\leq 1\text{-}5/8$ inches in diameter on existing equipment; Medium temperature lines require 3/4 inch flexible, closed-cell, nitrite rubber or equivalent insulation; Low temperature lines require 1-inch flexible, closed-cell, nitrite rubber or equivalent	\$6	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
				insulation; Insulation exposed to the outdoors must be protected from the weather			
Refrigerated Display Case with Doors Replacing Open Case	Per Foot	No	No	A new, vertical case with no sweat doors that meets federal standard requirements, replaces open display case	\$390	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Adding Doors to Existing Refrigerated Display Case	Per Foot	No	No	Retrofit existing vertical open display cases with zero heat doors	\$419	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Refrigerated Case Light Occupancy Sensors	Per Product	No	No	Motion-based lighting controls that allow LED case lighting to be dimmed or turned off	\$55	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Novelty Cooler Shutoff Timer	Per Product	No	No	Adds a control system feature to automatically shut off novelty coolers based on pre-set store operating hours	\$303	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Clothes Washer	Per Product	No	No	ENERGY STAR commercial clothes washer in commercial laundromat or multifamily laundry room	\$677	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Bathroom Ventilation Fan in Commercial Application	Per Product	No	No	ENERGY STAR	\$49	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Ice Machines	Per Product	No	No	ENERGY STAR air-cooled batch-type or continuous ice machine	\$414	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Beverage and Snack Machine Controls	Per Product	No	No	Added to non-ENERGY STAR, non-refrigerated machines	\$245	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Electric Steam Cooker	Per Product	No	No	ENERGY STAR	\$1,706	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Combination Oven	Per Product	No	No	5-40 pan capacity, meets ENERGY STAR idle rate and cooking efficiency requirements	\$1,899	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Convection Oven	Per Product	No	No	Installation of an electric convection oven that meets ENERGY STAR specifications.	\$1,118	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Fryer	Per Product	No	No	ENERGY STAR	\$1,903	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Hot Food Holding Cabinet	Per Product	No	No	ENERGY STAR	\$2,479	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Dishwasher	Per Product	No	No	ENERGY STAR version 3.0	\$5,576	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Griddle	Per Product	No	No	ENERGY STAR	\$1,289	12	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
Commercial Induction Cooktops	Per Product	No	No	Each cooking unit/zone within the induction cooktop must meet a minimum 80% cooking (boil) energy efficiency percentage as determined by the ASTM F1521-22 test method	\$574	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ceiling & Wall Insulation	Per SQFT	No	Yes	Installation of insulation in conditioned, non-residential buildings or in common areas of multifamily complexes that are electrically heated and/or cooled	\$1	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Advanced Power Strips	Per Product	No	No	Tier 1 or Tier 2	\$24	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Server	Per Product	No	No	ENERGY STAR, replacement of an existing server in a data center or closet	\$2,204	4	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Server Virtualization	Per Product	No	No	Consolidation of virtualized servers that are either removed or physically disconnected from power	\$1,089	4	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Cycling Refrigerated Thermal Mass Dryer	Per HP	No	Yes	≤ 600 CFM capacity	\$5	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Air-Entraining Air Nozzle	Per Product	No	No	Replacement of a non-air entraining air nozzle, uses <15 CFM at 100 psig, industrial applications	\$495	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
No-Loss Condensate Drain	Per Product	No	No	Retrofit existing timed drained system with new no-loss condensate drain properly sized for the compressed air system	\$256	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Air Tanks for Load/No Load Compressors	Per HP	No	No	Installation of new air receivers with pressure/flow controls to load/no load compressors with storage ratio of ≥ 4 gallons of storage per CFM.	\$7,000	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Variable-Speed Drive Air Compressor	Per HP	No	Yes	Installation or retrofit a ≤ 40 HP compressor with variable speed control	\$7,000	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Compressed Air Controller	Per HP	No	Yes	Installation of a compressed air pressure or flow controller for compressed air systems, minimum storage of 3gal/ CFM, compressed air systems total motor nameplate capacity ≥ 40 hp	\$36	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Compressed Air Low Pressure Drop Filters	Per HP	No	No	Pressure drop ≤ 1 psi when new and 3 psi at element change	\$12	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Compressed Air Mist Eliminations	Per HP	No	No	Installation of mist eliminator air filters for compressed air system with < 1 psi pressure drop and > 50 HP	\$20	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Efficiency Transformer	Per Product	No	Yes	More efficient than the federal standard	\$3,117	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Engine Block Heater Timer	Per Product	No	Yes	Commercial, industrial, and agricultural applications	\$17	15	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
High Frequency Battery Chargers	Per Product	No	Yes	Minimum power conversion efficiency of 90% and 8-hour shift operation five days per week	\$402	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Uninterruptible Power Supply (UPS)	Per Product	No	Yes	ENERGY STAR version 2.0 UPS alternating current output system < 2 kW that connects to a 15A single phase 120V outlet (NEMA 5-15A)	\$47	7	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Building Operator Certification Training	Per Project	No	No	Training by an institution that is accredited by the National BOC Advisory Commission, with certificate of completion. Applicable to buildings that exceed 20,000 sq ft	\$4,299	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Photovoltaic (PV) Solar Generation	Per Project	No	Yes, when combined with other measures	Installation of a photovoltaic solar system that uses generated power to offset concurrent building loads and feeds onto the local power grid through net metering. All projects must receive an interconnection agreement and comply with all EDC requirements.	\$162,703	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Automatic Milker Takeoffs	Per Product	No	No	Installation of automatic milker take-offs that determine milking end time, with a vacuum pump system serving the impacted milking units that is equipped with a variable speed drive	\$3,004	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Dairy Scroll Compressors	Per Product	No	Yes	Replaces an existing reciprocating compressor or installed in a new construction application	\$557	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ag High-Efficiency Ventilation Fans With	Per Product	No	Yes	Installation of high-efficiency ventilation fans to replace standard efficiency ventilation fans or	\$281	13	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
and Without Thermostats				the installation of a thermostat controlling either new efficient fans or existing fans. Equipment must be purchased through a commercial channel for installation at a farm.			\$2500/kW first year savings
Ag Heat Reclaimers	Per Product	No	Yes	Installation of heat recovery equipment on dairy parlor milk refrigeration systems to pre-heat hot water. Must have electric water heating equipment	\$5,840	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ag High Volume Low Speed Fans	Per Product	No	No	Replaces conventional circulating fans, meets federal baseline standards with a ceiling fan energy index that ≥ 1.31 at 40% rated RPM and has a CEI ≥ 1.00 at 100% rated RPM	\$7,010	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Livestock Waterer	Per Product	No	No	Thermostatically controlled with 2-inches or more of factory-installed insulation.	\$553	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Variable Speed Drive (VSD) Controller on Dairy Vacuum Pumps	Per Product	No	Yes	Installation of a VSD and controls on dairy vacuum pumps, or the purchase of dairy vacuum pumps with variable speed capability	\$5,052	14	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Low Pressure Irrigation System	Per Product	No	Yes	$\geq 50\%$ reduction in irrigation pumping pressure, pre- and post-retrofit pump pressure measurements are required	\$1,138	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM HVAC	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$317,277	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
CUSTOM AGRICULTURE	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$455,253	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM MOTORS / COMPRESSED AIR	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$151,016	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM REFRIGERATION	Per Project	No	No	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$256,736	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Custom CHP	Per Project	No	Yes	Projects may be required to meet minimum TRC	\$5,710,026	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Custom Other	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site.	\$513,825	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Virtual RCx	Per Participant	No	No	SCI customer sector and available usage data	\$83,237	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Benchmarking	Per Benchmark	No	No	SCI customer sector and available usage data	\$0	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Financing Buy Down	Per Loan	No	No	Meets third-party eligibility	\$7,849	5	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
Facility Assessments	Per Participant	No	No	None, by customer request	\$1,000	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Technical Audits/Feasibility Studies	Per Audit	No	No	None, by customer request	\$7,000	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
C&I Load Shift	Per Participant & Per kW	No	No	SCI customer sector and available usage and billing data	\$37,500	1	Up to \$100/kW, up to \$100,000 per participant

Table 47. Pa PUC TABLE 8 – Large C&I Eligible Measures

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Lighting Retrofits	Per Product	No	No	LED fixtures and lamps replacing less efficient lighting in existing commercial or industrial facilities. Screw-based integrated LED lamps are not eligible	\$319	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
New Construction Lighting	Per Project	No	No	New construction, ≥ 45 lumens/watt	\$532,614	15	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
Lighting Controls	Per Product	No	No	Automatically adjusts lighting levels based on schedule or sensor	\$564	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
LED Exit Signs	Per Product	No	No	Early replacement from incandescent or fluorescent to LED	\$33	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
LED Refrigeration Display Case Lighting	Per Door	No	No	Retrofit on existing refrigerator, freezer, or cooler	\$11	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Midstream Lighting	Per Product	No	No	LED fixtures and lamps replacing less efficient lighting in existing commercial or industrial facilities. Screw-based integrated LED lamps are not eligible	\$713	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Indoor Horticultural Lighting	Per Project	No	No	Design Lights Consortium (DLC) Horticultural Technical Requirements V3.0 or later	\$254,188	7	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ASHP and Air Source AC	Per Product	No	Yes	Comfort heating and/or cooling end use	\$18,658	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
ASHP and Air Source AC - Midstream	Per Product	No	Yes	Comfort heating and/or cooling end use	\$18,658	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Electric Chiller	Per Product	No	Yes	Standard comfort cooling applications, defined as unitary electric chillers serving a single load at the system or sub-system level	\$76,816	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ground or Groundwater Source Heat Pump	Per Product	No	Yes	Exceeds energy efficiency requirements of the International Energy Conservation Code (IECC) 2021	\$10,985	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ductless Mini-Split Heat Pump	Per Product	No	Yes	Cold Climate, ENERGY STAR Version 6.1	\$1,516	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Midstream Mini-Split Heat Pump	Per Product	No	Yes	Cold Climate, ENERGY STAR Version 6.1	\$1,516	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
HVAC Tune Up	Per Project	No	No	Documented tune-ups for air conditioners and heat pumps operating in commercial applications up to 20 tons	\$7,538	3	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Room Air Conditioner	Per Product	No	No	Efficiency exceeds the minimum level as required by the federal standards effective May 26, 2026	\$124	9	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
HVAC Controls: Guest Room Occupancy Sensor	Per Product	No	No	Automatically adjusts the temperature setback in hotel guest rooms during unoccupied periods	\$208	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
HVAC Controls: Economizer	Per SQFT	No	Yes	Dual enthalpy economizers on HVAC equipment in commercial applications	\$0.05	3	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Computer Room Air Conditioner	Per Product	No	Yes	Exceed TRM baseline efficiencies	\$904	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Electronically Commutated Plug Fans on Computer Room Air Conditioner/Handler	Per HP	No	No	Electronically Commutated Plug Fan	\$277	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
VSD on Computer Room Air Conditioner or Handler Fan Motor	Per HP	No	Yes	New construction or retrofit	\$340	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Circulation Fan: High-Volume Low-Speed	Per Product	No	Yes	8 to 24 ft diameter, commercial and industrial applications	\$4,074	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Demand Controlled Ventilation	Per SQFT	No	Yes	Commercial and institutional applications, retrofit on HVAC systems without economizers installed	\$2	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Advanced Rooftop Controls	Per Product	No	Yes	Commercial and institutional applications in buildings served by single-zone packaged HVAC units that include functional integrated economizers	\$3,146	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Connected Thermostat	Per Product	No	No	ENERGY STAR	\$76	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Duct Sealing And Insulation	Per Product	No	Yes	Retrofit only, HVAC supply ducts passing through an unconditioned space	\$10,860	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Chilled Water Pipe Insulation	Per Foot	No	No	Electric chiller, retrofit, ≥ 1 inch of insulation	\$10	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Premium Efficiency Motors	Per HP	No	Yes	Replacement of old motors with new energy efficient motors of the same rated HP	\$197	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
VFD Improvements	Per Product	No	Yes	A motor with a VFD control replacing a motor without a VFD control	\$2,067	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ECM Circulating Fan	Per Product	No	Yes	Circulating fan motors of 1 HP or less, retrofit for air handling equipment with an SP or PSC fan motor	\$319	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
VSD on Kitchen Exhaust Fan	Per HP	No	No	Kitchen ventilation system with VSD and demand ventilation controls and sensors	\$1,069	15	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
ECM Circulator Pump	Per Product	No	Yes	An ECM or BPM circulator pump replacing single-speed induction motor circulator pumps in space heating and hot water applications.	\$66	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Efficiency Pumps	Per Product	No	Yes	Compliant pumps will achieve a PEI of 1.0 or less. All pumps manufactured after January 27, 2020 must comply with the DOE's energy conservation standard as described in 10 CFR 431 Subpart Y.	\$142	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Heat Pump Water Heaters	Per Product	No	Yes	ENERGY STAR	\$1,204	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Low Flow Pre-Rinse Spray Valves	Per Product	No	No	Electric water heater, maximum GPM varies by product class	\$662	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Domestic Hot Water Pipe Insulation	Per Project	No	No	Uninsulated electric DHW piping in non-residential facility with looped system and operational circulation pump, ≥ 1 inch of insulation that complies with the IECC specifications	\$4	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Freezer Case	Per Product	No	No	ENERGY STAR	\$750	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Efficiency Evaporator Fan	Per Product	No	Yes	Replacement of existing SP evaporator fan motors or PSC motors in walk-in or reach-in	\$312	15	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Motors for Walk-in or Reach-in Cases				refrigerated display cases with an ECM or a PMS motor			\$2500/kW first year savings
Evaporator Fan Controllers	Per Product	No	Yes	Installed in medium-temperature walk-in or reach-in coolers or low temperature walk-in or reach-in freezers	\$162	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Floating Head Pressure Control	Per HP	No	Yes	Applied to a single-compressor refrigeration system with FHPC in commercial applications. FHPCs must have a minimum Saturated Condensing Temperature programmed for the floating head pressure control of ≤ 70 °F. Compressor must be 1 HP or larger.	\$431	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Anti-Sweat Heater Control	Per Product	No	Yes	Added to glass door cooler or refrigerator with uncontrolled heaters utilizing either ON/OFF or micro pulse controls	\$831	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Evaporator Coil Defrost Control	Per Product	No	Yes	Added to existing walk-in coolers or freezers without defrost controls	\$987	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Variable Speed Refrigeration Compressor	Per HP	No	Yes	Replaces a slide valve control system in an existing commercial refrigeration system	\$1,951	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Strip Curtains for Walk-in Cooler or Freezer	Per Product	No	No	Installed or retrofit strip curtains in commercial walk-in cooler and freezer doors. Strip curtains must be at least 0.06 inches thick	\$3,776	4	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Night Covers for Display Cases	Per Product	No	No	Installed on existing open-type refrigerated display cases, where covers are deployed during the facility's unoccupied hours	\$72	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Auto Closer for Cooler or Freezer	Per Product	No	No	Installed for walk-in freezer or cooler, door perimeter ≥ 16 feet	\$494	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Door with Low or No Anti-Sweat Heat for Reach-In Cooler or Freezer	Per Product	No	No	Upright display case door ≥ 57 inches tall, no-heat/low-heat clear glass door with heat reflective treated glass, be gas filled, or both	\$697	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Suction Pipe Insulation for Walk-In Cooler or Freezer	Per Foot	No	No	Must insulate bare refrigeration suction lines $\leq 1\text{-}5/8$ inches in diameter on existing equipment ; Medium temperature lines require 3/4 inch flexible, closed-cell, nitrile rubber or equivalent insulation; Low temperature lines require 1-inch flexible, closed-cell, nitrile rubber or equivalent insulation; Insulation exposed to the outdoors must be protected from the weather	\$6	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Refrigerated Display Case with Doors Replacing Open Case	Per Foot	No	No	A new, vertical case with no sweat doors that meets federal standard requirements, replaces open display case	\$390	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Adding Doors to Existing Refrigerated Display Case	Per Foot	No	No	Retrofit existing vertical open display cases with zero heat doors	\$419	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Refrigerated Case Light Occupancy Sensors	Per Product	No	No	Motion-based lighting controls that allow LED case lighting to be dimmed or turned off	\$55	8	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Novelty Cooler Shutoff Timer	Per Product	No	No	Adds a control system feature to automatically shut off novelty coolers based on pre-set store operating hours	\$303	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Clothes Washer	Per Product	No	No	ENERGY STAR commercial clothes washer in commercial laundromat or multifamily laundry room	\$677	11	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Bathroom Ventilation Fan in Commercial Application	Per Product	No	No	ENERGY STAR	\$49	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Ice Machines	Per Product	No	No	ENERGY STAR air-cooled batch-type or continuous ice machine	\$414	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Beverage and Snack Machine Controls	Per Product	No	No	Added to non-ENERGY STAR, non-refrigerated machines	\$245	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Electric Steam Cooker	Per Product	No	No	ENERGY STAR	\$1,706	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Combination Oven	Per Product	No	No	5-40 pan capacity, meets ENERGY STAR idle rate and cooking efficiency requirements	\$1,899	12	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
ENERGY STAR Commercial Convection Oven	Per Product	No	No	Installation of an electric convection oven that meets ENERGY STAR specifications.	\$1,118	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Fryer	Per Product	No	No	ENERGY STAR	\$1,903	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Hot Food Holding Cabinet	Per Product	No	No	ENERGY STAR	\$2,479	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Dishwasher	Per Product	No	No	ENERGY STAR version 3.0	\$2,472	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Commercial Griddle	Per Product	No	No	ENERGY STAR	\$1,289	12	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Commercial Induction Cooktops	Per Product	No	No	Each cooking unit/zone within the induction cooktop must meet a minimum 80% cooking (boil) energy efficiency percentage as determined by the ASTM F1521-22 test method	\$574	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ceiling & Wall Insulation	Per SQFT	No	Yes	Installation of insulation in conditioned, non-residential buildings or in common areas of multifamily complexes that are electrically heated and/or cooled	\$1	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Advanced Power Strips	Per Product	No	No	Tier 1 or Tier 2	\$24	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
ENERGY STAR Server	Per Product	No	No	ENERGY STAR, replacement of an existing server in a data center or closet	\$2,204	4	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Server Virtualization	Per Product	No	No	Consolidation of virtualized servers that are either removed or physically disconnected from power	\$1,089	4	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Cycling Refrigerated Thermal Mass Dryer	Per HP	No	Yes	≤ 600 CFM capacity	\$5	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Air-Entraining Air Nozzle	Per Product	No	No	Replacement of a non-air entraining air nozzle, uses <15 CFM at 100 psig, industrial applications	\$146	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
No-Loss Condensate Drain	Per Product	No	No	Retrofit existing timed drained system with new no-loss condensate drain properly sized for the compressed air system	\$256	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Air Tanks for Load/No Load Compressors	Per HP	No	No	Installation of new air receivers with pressure/flow controls to load/no load compressors with storage ratio of ≥ 4 gallons of storage per CFM	\$7,000	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Variable-Speed Drive Air Compressor	Per HP	No	Yes	Installation or retrofit a ≤40 HP compressor with variable speed control	\$7,000	13	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
							\$2500/kW first year savings
Compressed Air Controller	Per HP	No	Yes	Installation of a compressed air pressure or flow controller for compressed air systems, minimum storage of 3gal/ CFM, compressed air systems total motor nameplate capacity $\geq$ 40 hp	\$36	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Compressed Air Low Pressure Drop Filters	Per HP	No	No	Pressure drop $\leq$ 1 psi when new and 3 psi at element change	\$12	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Compressed Air Mist Eliminations	Per HP	No	No	Installation of mist eliminator air filters for compressed air system with < 1 psi pressure drop and > 50 HP	\$1	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Efficiency Transformer	Per Product	No	Yes	More efficient than the federal standard	\$3,117	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Engine Block Heater Timer	Per Product	No	Yes	Commercial, industrial, and agricultural applications	\$17	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
High Frequency Battery Chargers	Per Product	No	Yes	Minimum power conversion efficiency of 90% and 8-hour shift operation five days per week	\$402	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Uninterruptible Power Supply (UPS)	Per Product	No	Yes	ENERGY STAR version 2.0 UPS alternating current output system < 2 kW that connects to a 15A single phase 120V outlet (NEMA 5-15A)	\$47	7	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Building Operator Certification Training	Per Project	No	No	Training by an institution that is accredited by the National BOC Advisory Commission, with certificate of completion. Applicable to buildings that exceed 20,000 sq ft	\$4,299	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Photovoltaic (PV) Solar Generation	Per Project	No	Yes, when combined with other measures	Installation of a photovoltaic solar system that uses generated power to offset concurrent building loads and feeds onto the local power grid through net metering. All projects must receive an interconnection agreement and comply with all EDC requirements	\$895,750	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Automatic Milker Takeoffs	Per Product	No	No	Installation of automatic milker take-offs that determine milking end time, with a vacuum pump system serving the impacted milking units that is equipped with a variable speed drive	\$3,004	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Dairy Scroll Compressors	Per Product	No	Yes	Replaces an existing reciprocating compressor or installed in a new construction application	\$557	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ag High-Efficiency Ventilation Fans With and Without Thermostats	Per Product	No	Yes	Installation of high-efficiency ventilation fans to replace standard efficiency ventilation fans or the installation of a thermostat controlling either new efficient fans or existing fans. Equipment must be purchased through a commercial channel for installation at a farm.	\$281	13	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ag Heat Reclaimers	Per Product	No	Yes	Installation of heat recovery equipment on dairy parlor milk refrigeration systems to pre-heat hot water. Must have electric water heating equipment	\$5,840	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Ag High Volume Low Speed Fans	Per Product	No	No	Replaces conventional circulating fans, meets federal baseline standards with a ceiling fan	\$7,010	15	Up to \$0.75/kWh and/or up to

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
				energy index that ≥ 1.31 at 40% rated RPM and has a CEI ≥ 1.00 at 100% rated RPM			\$2500/kW first year savings
Livestock Waterer	Per Product	No	No	Thermostatically controlled with 2-inches or more of factory-installed insulation.	\$553	10	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Variable Speed Drive (VSD) Controller on Dairy Vacuum Pumps	Per Product	No	Yes	Installation of a VSD and controls on dairy vacuum pumps, or the purchase of dairy vacuum pumps with variable speed capability	\$5,052	14	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Low Pressure Irrigation System	Per Product	No	Yes	$\geq 50\%$ reduction in irrigation pumping pressure, pre- and post-retrofit pump pressure measurements are required	\$1,138	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM HVAC	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$317,277	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM AGRICULTURE	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$455,253	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM MOTORS / COMPRESSED AIR	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$151,016	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
CUSTOM REFRIGERATION	Per Project	No	No	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$256,736	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings

Measure	Unit	Low-Income Measure	Comprehensive Measure	Eligibility Requirements	Incremental Cost (\$/unit)	Estimated Useful Life	Incentive Amount or Incentive Range (\$/unit)
Custom CHP	Per Project	No	Yes	Projects may be required to meet minimum TRC requirements	\$5,710,026	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Custom Other	Per Project	No	Yes	Eligibility determined by project type; may be subject to incentive caps by project and/or per site	\$513,825	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Financing Buy Down	Per Loan	No	No	Meets third-party eligibility	\$86,329	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Technical Audits/Feasibility Studies	Per Audit	No	No	None, by customer request	\$25,000	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Strategic Energy Management	Per Participant	No	No	None, by customer request	\$9,795	15	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
Compressed Air Challenge	Per Participant	No	No	Opt-in	\$495	5	Up to \$0.75/kWh and/or up to \$2500/kW first year savings
C&I Load Shift	Per Participant & Per kW	No	No	LCI customer sector and available usage and billing data	\$37,500	1	Up to \$100/kW, up to \$100,000 per participant

Deadline for Rebate Applications

All rebate and program applications must be associated with projects, installations, or treatments completed between June 1, 2026, and May 31, 2031. Applications must be submitted within 180 days of installation for all measures except comprehensive measures, as defined by the Commission in the plan template, though it will also include solar PV installations. The rebate application deadline for these measure categories may be extended up to 365 days due to potential delays from issues like supply chain changes, to allow time for proper documentation or quality control and assurance activities. The Company may waive the application requirement for any measure at its discretion based on customer need or other factors. PPL Electric Utilities, at its discretion, may allow customers to request project preapproval to lock in the stipulated incentive level and guarantee project funding or approve any rebate application that exceeds application deadlines to ensure customer satisfaction. Pre-approval requirements may be set or removed for any measure, at the Company's discretion. For any proposed changes to pre-approval or application deadlines, the Company will strive to provide a 30-day notification, though it reserves the right to make immediate changes based on the Company's discretion. Final program year rebate applications must be submitted by May 31, 2031.

Administrative Requirements

Internal staffing requirements for program administration, management, and other required activities include four and a half FTEs plus a variety of as-needed support staff from across the Company. External staffing requirements for all CSPs include 51 FTEs.

Estimated Savings and Participation

Table 48 and Table 49 show the participation, energy savings, and coincident peak demand estimates for the Small and Large Commercial and Industrial Business Solutions components. The estimates may change based on market conditions, customer preference, new technologies, regulations, local, state, or federal guidelines, or for any other reason. PPL Electric Utilities will manage the components to maximize customer satisfaction, overall program performance, and ensure cost-effective delivery of the portfolio.

Table 48. Pa PUC Table 9 – Small C&I Estimated Savings and Participation

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Lighting Retrofits	3.1.1	Energy Savings (MWh)	44,040.13	42,969.59	41,614.16	36,439.64	29,107.31	194,170.84
		Summer Demand Reduction (MW)	7.2830	7.1298	6.9081	6.0469	4.8301	32.1979
		Winter Demand Reduction (MW)	4.2526	4.1653	4.0363	3.5329	2.8220	18.8091
		Projected Participation ²	184,319	175,251	169,964	145,801	114,771	790,106
New Construction Lighting	3.1.2	Energy Savings (MWh)	2,158.93	3,598.21	3,598.21	2,698.66	1,979.02	14,033.02
		Summer Demand Reduction (MW)	0.3844	0.6406	0.6406	0.4804	0.3523	2.4983
		Winter Demand Reduction (MW)	0.3842	0.6404	0.6404	0.4803	0.3522	2.4974
		Projected Participation	12	20	20	15	11	78
Lighting Controls	3.1.3	Energy Savings (MWh)	448.93	507.56	611.68	511.01	378.86	2,458.05
		Summer Demand Reduction (MW)	0.0857	0.0968	0.1165	0.0973	0.0722	0.4684
		Winter Demand Reduction (MW)	0.0638	0.0720	0.0866	0.0724	0.0537	0.3485
		Projected Participation	564	629	737	619	466	3,015
LED Exit Signs	3.1.4	Energy Savings (MWh)	28.17	27.89	28.17	22.64	16.57	123.44
		Summer Demand Reduction (MW)	0.0037	0.0037	0.0037	0.0030	0.0022	0.0163
		Winter Demand Reduction (MW)	0.0033	0.0033	0.0033	0.0026	0.0019	0.0144
		Projected Participation	102	101	102	82	60	447
LED Refrigeration Display Case Lighting	3.1.5	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.62	0.62
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	1	1

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Midstream Lighting	3.1.6	Energy Savings (MWh)	13,253.05	13,253.05	12,857.86	12,324.36	11,265.71	62,954.03
		Summer Demand Reduction (MW)	3.3994	3.3994	3.2977	3.1614	2.8897	16.1477
		Winter Demand Reduction (MW)	3.3817	3.3817	3.2807	3.1448	2.8746	16.0635
		Projected Participation	102,281	102,281	99,214	95,122	86,940	485,838
Indoor Horticultural Lighting	3.1.7	Energy Savings (MWh)	486.99	929.71	1,372.43	1,372.43	1,815.15	5,976.71
		Summer Demand Reduction (MW)	0.1026	0.1960	0.2893	0.2893	0.3826	1.2597
		Winter Demand Reduction (MW)	0.1026	0.1960	0.2893	0.2893	0.3826	1.2597
		Projected Participation	2	3	4	4	5	18
ASHP and Air Source AC	3.2.1	Energy Savings (MWh)	11.69	14.67	31.46	35.80	41.46	135.09
		Summer Demand Reduction (MW)	0.0042	0.0044	0.0096	0.0108	0.0124	0.0414
		Winter Demand Reduction (MW)	0.0012	0.0073	0.0167	0.0200	0.0229	0.0682
		Projected Participation	12	8	11	11	14	56
ASHP and Air Source AC - Midstream	3.2.2	Energy Savings (MWh)	0.00	199.48	199.48	199.48	22.90	621.33
		Summer Demand Reduction (MW)	0.0000	0.0664	0.0664	0.0664	0.0073	0.2066
		Winter Demand Reduction (MW)	0.0000	0.0837	0.0837	0.0837	0.0135	0.2647
		Projected Participation	0	84	84	84	4	256
Electric Chiller	3.2.3	Energy Savings (MWh)	123.41	53.54	97.60	35.69	61.90	372.15
		Summer Demand Reduction (MW)	0.0534	0.0245	0.0446	0.0163	0.0283	0.1671
		Winter Demand Reduction (MW)	0.0024	0.0011	0.0020	0.0007	0.0013	0.0075
		Projected Participation	5	3	4	2	2	16
	3.2.4	Energy Savings (MWh)	0.00	0.00	0.00	1.91	0.00	1.91
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Ground or Groundwater Source Heat Pump		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0007	0.0000	0.0007
		Projected Participation	0	0	0	1	0	1
Ductless Mini-Split Heat Pump	3.2.5	Energy Savings (MWh)	18.96	28.43	38.86	23.70	9.48	119.43
		Summer Demand Reduction (MW)	0.0175	0.0262	0.0358	0.0218	0.0087	0.1100
		Winter Demand Reduction (MW)	0.0133	0.0199	0.0272	0.0166	0.0066	0.0837
		Projected Participation	20	30	41	25	10	126
Midstream Mini-Split Heat Pump	3.2.6	Energy Savings (MWh)	0.00	5.10	5.10	5.10	0.00	15.29
		Summer Demand Reduction (MW)	0.0000	0.0047	0.0047	0.0047	0.0000	0.0142
		Winter Demand Reduction (MW)	0.0000	0.0036	0.0036	0.0036	0.0000	0.0108
		Projected Participation	0	6	6	6	0	18
Small C&I HVAC Refrigerant Charge Correction	3.2.7	Energy Savings (MWh)	3.11	0.00	0.00	0.00	0.00	3.11
		Summer Demand Reduction (MW)	0.0012	0.0000	0.0000	0.0000	0.0000	0.0012
		Winter Demand Reduction (MW)	0.0007	0.0000	0.0000	0.0000	0.0000	0.0007
		Projected Participation	2	0	0	0	0	2
HVAC Tune Up	3.2.8	Energy Savings (MWh)	6,015.81	5,241.17	5,158.76	3,757.82	2,422.81	22,596.38
		Summer Demand Reduction (MW)	1.8351	1.5988	1.5737	1.1463	0.7391	6.8931
		Winter Demand Reduction (MW)	0.1298	0.1408	0.1395	0.1182	0.1967	0.7249
		Projected Participation	365	318	313	228	147	1,371
Room Air Conditioner	3.2.9	Energy Savings (MWh)	0.00	0.00	0.00	0.02	0.00	0.02
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	1	0	1

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
HVAC Controls: Guest Room Occupancy Sensor	3.2.10	Energy Savings (MWh)	1.28	1.28	1.28	0.86	0.43	5.14
		Summer Demand Reduction (MW)	0.0003	0.0003	0.0003	0.0002	0.0001	0.0013
		Winter Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0000	0.0000	0.0002
		Projected Participation	3	3	3	2	1	12
HVAC Controls: Economizer	3.2.11	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Computer Room Air Conditioner	3.2.12	Energy Savings (MWh)	0.00	0.00	12.09	0.00	0.00	12.09
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0149	0.0000	0.0000	0.0149
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0149	0.0000	0.0000	0.0149
		Projected Participation	0	0	6	0	0	6
Electronically Commutated Plug Fans on Computer Room Air Conditioner/Handler	3.2.13	Energy Savings (MWh)	0.00	0.00	0.00	0.00	1.88	1.88
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
		Projected Participation	0	0	0	0	1	1
VSD on Computer Room Air Conditioner or Handler Fan Motor	3.2.14	Energy Savings (MWh)	0.00	0.00	0.00	0.00	2.28	2.28
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
		Projected Participation	0	0	0	0	1	1
Circulation Fan: High-Volume Low-Speed	3.2.15	Energy Savings (MWh)	22.26	26.71	31.16	22.26	17.81	120.20
		Summer Demand Reduction (MW)	0.0121	0.0146	0.0170	0.0121	0.0097	0.0656

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0048	0.0058	0.0068	0.0048	0.0039	0.0261
		Projected Participation	5	6	7	5	4	27
Demand Controlled Ventilation	3.2.16	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	3	3
Advanced Rooftop Controls	3.2.17	Energy Savings (MWh)	0.00	2.59	0.00	0.00	0.00	2.59
		Summer Demand Reduction (MW)	0.0000	0.0012	0.0000	0.0000	0.0000	0.0012
		Winter Demand Reduction (MW)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
		Projected Participation	0	1	0	0	0	1
ENERGY STAR Connected Thermostat	3.2.18	Energy Savings (MWh)	0.62	0.32	0.66	0.32	0.62	2.55
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0001	0.0000	0.0001	0.0003
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	2	2	3	2	2	11
Adjustment to Programmable Thermostats	3.2.19	Energy Savings (MWh)	1.70	0.00	1.70	0.00	0.00	3.40
		Summer Demand Reduction (MW)	0.0004	0.0000	0.0004	0.0000	0.0000	0.0008
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0001	0.0000	0.0000	0.0002
		Projected Participation	1	0	1	0	0	2
Duct Sealing And Insulation	3.2.20	Energy Savings (MWh)	0.00	0.00	0.00	0.82	0.00	0.82
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0004	0.0000	0.0004
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	1	0	1

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Chilled Water Pipe Insulation	3.2.21	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Premium Efficiency Motors	3.3.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.13	0.13
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	5	5
VFD Improvements	3.3.2	Energy Savings (MWh)	310.05	452.63	563.08	424.12	310.05	2,059.93
		Summer Demand Reduction (MW)	0.0362	0.0533	0.0655	0.0498	0.0362	0.2410
		Winter Demand Reduction (MW)	0.0778	0.1130	0.1416	0.1060	0.0778	0.5162
		Projected Participation	10	15	18	14	10	67
ECM Circulating Fan	3.3.3	Energy Savings (MWh)	0.00	0.00	0.68	0.00	0.00	0.68
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
VSD on Kitchen Exhaust Fan	3.3.4	Energy Savings (MWh)	13.27	44.23	44.23	44.23	30.96	176.93
		Summer Demand Reduction (MW)	0.0023	0.0075	0.0075	0.0075	0.0053	0.0301
		Winter Demand Reduction (MW)	0.0019	0.0063	0.0063	0.0063	0.0044	0.0252
		Projected Participation	3	10	10	10	7	40
ECM Circulator Pump	3.3.5	Energy Savings (MWh)	0.00	0.00	5.17	0.00	0.00	5.17
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0011	0.0000	0.0000	0.0011

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0007	0.0000	0.0000	0.0007
		Projected Participation	0	0	2	0	0	2
High Efficiency Pumps	3.3.6	Energy Savings (MWh)	0.00	0.00	6.96	0.00	0.00	6.96
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0013	0.0000	0.0000	0.0013
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0010	0.0000	0.0000	0.0010
		Projected Participation	0	0	1	0	0	1
Heat Pump Water Heaters	3.4.1	Energy Savings (MWh)	2.73	0.00	0.00	0.00	2.73	5.45
		Summer Demand Reduction (MW)	0.0009	0.0000	0.0000	0.0000	0.0009	0.0018
		Winter Demand Reduction (MW)	0.0004	0.0000	0.0000	0.0000	0.0004	0.0008
		Projected Participation	1	0	0	0	1	2
Low Flow Pre-Rinse Spray Valves	3.4.2	Energy Savings (MWh)	4.14	4.14	4.14	4.14	4.14	20.70
		Summer Demand Reduction (MW)	0.0012	0.0012	0.0012	0.0012	0.0012	0.0058
		Winter Demand Reduction (MW)	0.0006	0.0006	0.0006	0.0006	0.0006	0.0032
		Projected Participation	2	2	2	2	2	10
Domestic Hot Water Pipe Insulation	3.4.3	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Freezer Case	3.5.1	Energy Savings (MWh)	0.00	0.34	0.15	0.63	4.20	5.33
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0005	0.0007
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0005	0.0007
		Projected Participation	0	2	1	2	8	13

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
High Efficiency Evaporator Fan Motors for Walk-in or Reach-in Cases	3.5.2	Energy Savings (MWh)	32.16	39.96	42.88	37.04	31.19	183.23
		Summer Demand Reduction (MW)	0.0040	0.0050	0.0053	0.0046	0.0039	0.0227
		Winter Demand Reduction (MW)	0.0040	0.0050	0.0053	0.0046	0.0039	0.0227
		Projected Participation	33	41	44	38	32	188
Evaporator Fan Controllers	3.5.3	Energy Savings (MWh)	2.09	2.22	2.32	2.22	1.40	10.26
		Summer Demand Reduction (MW)	0.0008	0.0009	0.0009	0.0009	0.0005	0.0041
		Winter Demand Reduction (MW)	0.0008	0.0009	0.0009	0.0009	0.0005	0.0041
		Projected Participation	9	10	9	10	7	45
Floating Head Pressure Control	3.5.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.58	0.58
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Anti-Sweat Heater Control	3.5.5	Energy Savings (MWh)	11.72	14.66	17.59	14.66	14.66	73.28
		Summer Demand Reduction (MW)	0.0004	0.0006	0.0007	0.0006	0.0006	0.0028
		Winter Demand Reduction (MW)	0.0003	0.0004	0.0004	0.0004	0.0004	0.0018
		Projected Participation	4	5	6	5	5	25
Evaporator Coil Defrost Control	3.5.6	Energy Savings (MWh)	0.31	0.62	0.77	0.46	0.31	2.47
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	2	4	5	3	2	16
	3.5.7	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.70	0.70
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Variable Speed Refrigeration Compressor		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Strip Curtains for Walk-in Cooler or Freezer	3.5.8	Energy Savings (MWh)	12.75	96.27	133.52	83.51	83.51	409.57
		Summer Demand Reduction (MW)	0.0023	0.0173	0.0211	0.0150	0.0150	0.0707
		Winter Demand Reduction (MW)	0.0023	0.0173	0.0211	0.0150	0.0150	0.0707
		Projected Participation	1	10	18	9	9	47
Night Covers for Display Cases	3.5.9	Energy Savings (MWh)	0.00	0.00	4.35	0.00	0.00	4.35
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	2	0	0	2
Auto Closer for Cooler or Freezer	3.5.10	Energy Savings (MWh)	0.00	15.51	23.26	15.51	15.51	69.79
		Summer Demand Reduction (MW)	0.0000	0.0043	0.0065	0.0043	0.0043	0.0194
		Winter Demand Reduction (MW)	0.0000	0.0043	0.0065	0.0043	0.0043	0.0194
		Projected Participation	0	8	12	8	8	36
Door with Low or No Anti-Sweat Heat for Reach-In Cooler or Freezer	3.5.11	Energy Savings (MWh)	0.00	0.00	0.83	0.00	0.00	0.83
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Projected Participation	0	0	2	0	0	2
Suction Pipe Insulation for Walk-In Cooler or Freezer	3.5.12	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.16	0.16
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Refrigerated Display Case with Doors Replacing Open Case	3.5.13	Energy Savings (MWh)	0.00	0.00	0.00	0.00	80.73	80.73
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	-0.0017	-0.0017
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0341	0.0341
		Projected Participation	0	0	0	0	220	220
Adding Doors to Existing Refrigerated Display Case	3.5.14	Energy Savings (MWh)	0.00	0.00	0.00	0.00	68.84	68.84
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	-0.0032	-0.0032
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0285	0.0285
		Projected Participation	0	0	0	0	220	220
Refrigerated Case Light Occupancy Sensors	3.5.15	Energy Savings (MWh)	0.00	0.00	0.10	0.00	0.00	0.10
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	2	0	0	2
Novelty Cooler Shutoff Timer	3.5.16	Energy Savings (MWh)	0.00	0.00	0.07	0.00	0.00	0.07
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
ENERGY STAR Clothes Washer	3.6.1	Energy Savings (MWh)	0.00	0.32	0.09	0.09	0.09	0.60
		Summer Demand Reduction (MW)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
		Projected Participation	0	3	1	1	1	6
ENERGY STAR Bathroom Ventilation	3.6.2	Energy Savings (MWh)	0.00	0.06	0.00	0.00	0.00	0.06
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Fan in Commercial Application		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	1	0	0	0	1
ENERGY STAR Ice Machines	3.7.1	Energy Savings (MWh)	0.90	0.00	1.79	0.00	0.90	3.59
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0002	0.0000	0.0001	0.0003
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0002
		Projected Participation	1	0	2	0	1	4
Beverage and Snack Machine Controls	3.7.2	Energy Savings (MWh)	0.00	0.00	0.54	0.00	0.00	0.54
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	2	0	0	2
ENERGY STAR Electric Steam Cooker	3.7.3	Energy Savings (MWh)	5.97	0.00	11.94	0.00	5.97	23.88
		Summer Demand Reduction (MW)	0.0012	0.0000	0.0024	0.0000	0.0012	0.0049
		Winter Demand Reduction (MW)	0.0008	0.0000	0.0016	0.0000	0.0008	0.0031
		Projected Participation	1	0	2	0	1	4
ENERGY STAR Combination Oven	3.7.4	Energy Savings (MWh)	0.43	0.28	0.97	0.28	0.43	2.39
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0002	0.0001	0.0001	0.0005
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0001	0.0000	0.0001	0.0003
		Projected Participation	3	1	7	1	3	15
ENERGY STAR Commercial Convection Oven	3.7.5	Energy Savings (MWh)	6.29	0.00	7.26	0.00	0.97	14.52
		Summer Demand Reduction (MW)	0.0013	0.0000	0.0015	0.0000	0.0002	0.0030
		Winter Demand Reduction (MW)	0.0008	0.0000	0.0009	0.0000	0.0001	0.0019
		Projected Participation	3	0	4	0	1	8

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
ENERGY STAR Commercial Fryer	3.7.6	Energy Savings (MWh)	4.11	2.68	5.01	2.68	2.68	17.17
		Summer Demand Reduction (MW)	0.0008	0.0005	0.0010	0.0005	0.0005	0.0035
		Winter Demand Reduction (MW)	0.0005	0.0003	0.0007	0.0003	0.0003	0.0022
		Projected Participation	4	3	5	3	3	18
ENERGY STAR Commercial Hot Food Holding Cabinet	3.7.7	Energy Savings (MWh)	5.37	0.22	0.22	5.14	0.22	11.18
		Summer Demand Reduction (MW)	0.0011	0.0000	0.0000	0.0010	0.0000	0.0023
		Winter Demand Reduction (MW)	0.0007	0.0000	0.0000	0.0007	0.0000	0.0015
		Projected Participation	4	1	1	3	1	10
ENERGY STAR Commercial Dishwasher	3.7.8	Energy Savings (MWh)	15.20	32.54	183.69	15.20	19.48	266.11
		Summer Demand Reduction (MW)	0.0031	0.0066	0.0374	0.0031	0.0040	0.0542
		Winter Demand Reduction (MW)	0.0020	0.0042	0.0242	0.0020	0.0025	0.0350
		Projected Participation	2	3	13	2	3	23
ENERGY STAR Commercial Griddle	3.7.9	Energy Savings (MWh)	0.00	0.00	5.73	0.00	0.00	5.73
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0012	0.0000	0.0000	0.0012
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0007	0.0000	0.0000	0.0007
		Projected Participation	0	0	2	0	0	2
Commercial Induction Cooktops	3.7.10	Energy Savings (MWh)	0.00	0.00	0.01	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
Ceiling & Wall Insulation	3.8.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Advanced Power Strips	3.9.1	Energy Savings (MWh)	0.00	0.00	0.00	0.08	0.00	0.08
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	1	0	1
ENERGY STAR Server	3.9.2	Energy Savings (MWh)	0.00	0.00	0.00	15.68	0.00	15.68
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0020	0.0000	0.0020
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0021	0.0000	0.0021
		Projected Participation	0	0	0	3	0	3
Server Virtualization	3.9.3	Energy Savings (MWh)	0.00	0.00	0.00	0.46	0.00	0.46
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
		Projected Participation	0	0	0	1	0	1
Cycling Refrigerated Thermal Mass Dryer	3.10.1	Energy Savings (MWh)	0.00	1.82	1.82	1.82	1.82	7.28
		Summer Demand Reduction (MW)	0.0000	0.0004	0.0004	0.0004	0.0004	0.0016
		Winter Demand Reduction (MW)	0.0000	0.0005	0.0005	0.0005	0.0005	0.0019
		Projected Participation	0	60	60	60	60	240
Air-Entraining Air Nozzle	3.10.2	Energy Savings (MWh)	1.49	0.00	0.00	0.00	4.46	5.94
		Summer Demand Reduction (MW)	0.0003	0.0000	0.0000	0.0000	0.0010	0.0013
		Winter Demand Reduction (MW)	0.0004	0.0000	0.0000	0.0000	0.0012	0.0016
		Projected Participation	2	0	0	0	6	8

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
No-Loss Condensate Drain	3.10.3	Energy Savings (MWh)	2.43	4.86	12.15	4.86	6.07	30.37
		Summer Demand Reduction (MW)	0.0005	0.0011	0.0027	0.0011	0.0013	0.0066
		Winter Demand Reduction (MW)	0.0006	0.0013	0.0032	0.0013	0.0016	0.0080
		Projected Participation	2	4	10	4	5	25
Air Tanks for Load/No Load Compressors	3.10.4	Energy Savings (MWh)	0.00	3.35	3.35	3.35	32.14	42.20
		Summer Demand Reduction (MW)	0.0000	0.0007	0.0007	0.0007	0.0083	0.0104
		Winter Demand Reduction (MW)	0.0000	0.0007	0.0007	0.0007	0.0083	0.0104
		Projected Participation	0	15	15	15	17	62
Variable-Speed Drive Air Compressor	3.10.5	Energy Savings (MWh)	339.61	341.50	341.50	338.98	338.35	1,699.95
		Summer Demand Reduction (MW)	0.0747	0.0752	0.0752	0.0746	0.0745	0.3741
		Winter Demand Reduction (MW)	0.0747	0.0752	0.0752	0.0746	0.0745	0.3741
		Projected Participation	93	96	96	92	91	468
Compressed Air Controller	3.10.6	Energy Savings (MWh)	0.00	2.24	2.24	2.24	2.24	8.94
		Summer Demand Reduction (MW)	0.0000	0.0005	0.0005	0.0005	0.0005	0.0020
		Winter Demand Reduction (MW)	0.0000	0.0005	0.0005	0.0005	0.0005	0.0020
		Projected Participation	0	20	20	20	20	80
Compressed Air Low Pressure Drop Filters	3.10.7	Energy Savings (MWh)	0.00	1.09	1.09	1.09	1.09	4.35
		Summer Demand Reduction (MW)	0.0000	0.0002	0.0002	0.0002	0.0002	0.0009
		Winter Demand Reduction (MW)	0.0000	0.0002	0.0002	0.0002	0.0002	0.0009
		Projected Participation	0	45	45	45	45	180
Compressed Air Mist Eliminations	3.10.8	Energy Savings (MWh)	0.00	0.48	0.48	0.48	0.53	1.98
		Summer Demand Reduction (MW)	0.0000	0.0001	0.0001	0.0001	0.0001	0.0004

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0001	0.0001	0.0001	0.0001	0.0004
		Projected Participation	0	10	10	10	11	41
High Efficiency Transformer	3.11.1	Energy Savings (MWh)	0.49	0.99	0.99	0.99	0.49	3.95
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005
		Winter Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005
		Projected Participation	1	2	2	2	1	8
Engine Block Heater Timer	3.11.2	Energy Savings (MWh)	0.00	0.00	0.80	0.00	0.00	0.80
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
High Frequency Battery Chargers	3.11.3	Energy Savings (MWh)	7.00	8.76	10.51	8.76	7.00	42.03
		Summer Demand Reduction (MW)	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
		Projected Participation	4	5	6	5	4	24
Uninterruptible Power Supply (UPS)	3.11.4	Energy Savings (MWh)	0.00	0.00	0.45	0.00	0.00	0.45
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	3	0	0	3
Building Operator Certification Training	3.11.5	Energy Savings (MWh)	934.07	934.07	700.55	700.55	467.04	3,736.28
		Summer Demand Reduction (MW)	0.0680	0.0680	0.0510	0.0510	0.0340	0.2719
		Winter Demand Reduction (MW)	0.0480	0.0480	0.0360	0.0360	0.0240	0.1921
		Projected Participation	40	40	30	30	20	160

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Photovoltaic (PV) Solar Generation	3.11.6	Energy Savings (MWh)	11,478.92	13,392.07	12,541.78	7,652.61	1,488.01	46,553.38
		Summer Demand Reduction (MW)	4.0236	4.6943	4.3962	2.6824	0.5216	16.3181
		Winter Demand Reduction (MW)	0.6273	0.7318	0.6853	0.4182	0.0813	2.5439
		Projected Participation	54	63	59	36	7	219
Automatic Milker Takeoffs	4.1.1	Energy Savings (MWh)	3.38	0.00	0.00	0.00	0.00	3.38
		Summer Demand Reduction (MW)	0.0006	0.0000	0.0000	0.0000	0.0000	0.0006
		Winter Demand Reduction (MW)	0.0006	0.0000	0.0000	0.0000	0.0000	0.0006
		Projected Participation	1	0	0	0	0	1
Dairy Scroll Compressors	4.1.2	Energy Savings (MWh)	0.79	0.00	0.00	0.00	0.00	0.79
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	1	0	0	0	0	1
Ag High-Efficiency Ventilation Fans With and Without Thermostats	4.1.3	Energy Savings (MWh)	8.83	8.83	11.07	8.83	8.83	46.40
		Summer Demand Reduction (MW)	0.0019	0.0019	0.0024	0.0019	0.0019	0.0100
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	8	8	10	8	8	42
Ag Heat Reclaimers	4.1.4	Energy Savings (MWh)	0.00	0.00	7.12	0.00	0.00	7.12
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0013	0.0000	0.0000	0.0013
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0014	0.0000	0.0000	0.0014
		Projected Participation	0	0	2	0	0	2
Ag High Volume Low Speed Fans	4.1.5	Energy Savings (MWh)	1,043.14	1,326.89	1,340.74	1,150.49	874.51	5,735.78
		Summer Demand Reduction (MW)	0.5367	0.6800	0.6871	0.5906	0.4496	2.9439

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	112	152	154	128	94	640
Livestock Waterer	4.1.6	Energy Savings (MWh)	0.00	0.00	0.65	0.00	0.00	0.65
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0004	0.0000	0.0000	0.0004
		Projected Participation	0	0	1	0	0	1
Variable Speed Drive (VSD) Controller on Dairy Vacuum Pumps	4.1.7	Energy Savings (MWh)	20.39	30.38	30.38	20.39	30.38	131.92
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
		Projected Participation	2	3	3	2	3	13
Low Pressure Irrigation System	4.1.8	Energy Savings (MWh)	0.00	0.31	0.00	0.00	0.00	0.31
		Summer Demand Reduction (MW)	0.0000	0.0009	0.0000	0.0000	0.0000	0.0009
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	1	0	0	0	1
CUSTOM HVAC	Custom	Energy Savings (MWh)	1,130.98	1,130.98	1,130.98	1,130.98	1,130.98	5,654.88
		Summer Demand Reduction (MW)	0.2086	0.2086	0.2086	0.2086	0.2086	1.0432
		Winter Demand Reduction (MW)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0104
		Projected Participation	5	5	5	5	5	25
CUSTOM AGRICULTURE	Custom	Energy Savings (MWh)	419.64	419.64	419.64	839.28	419.64	2,517.84
		Summer Demand Reduction (MW)	0.0881	0.0881	0.0881	0.1761	0.0881	0.5284
		Winter Demand Reduction (MW)	0.0881	0.0881	0.0881	0.1761	0.0881	0.5284
		Projected Participation	1	1	1	2	1	6

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
CUSTOM MOTORS / COMPRESSED AIR	Custom	Energy Savings (MWh)	4,688.76	4,688.76	4,688.76	4,688.76	4,688.76	23,443.82
		Summer Demand Reduction (MW)	0.6701	0.6701	0.6701	0.6701	0.6701	3.3507
		Winter Demand Reduction (MW)	0.6701	0.6701	0.6701	0.6701	0.6701	3.3507
		Projected Participation	11	11	11	11	11	55
CUSTOM REFRIGERATION	Custom	Energy Savings (MWh)	3,177.37	3,177.37	3,177.37	3,177.37	3,177.37	15,886.85
		Summer Demand Reduction (MW)	0.4442	0.4442	0.4442	0.4442	0.4442	2.2209
		Winter Demand Reduction (MW)	0.1777	0.1777	0.1777	0.1777	0.1777	0.8884
		Projected Participation	7	7	7	7	7	35
Custom CHP	Custom	Energy Savings (MWh)	0.00	8,967.96	4,483.98	4,483.98	4,483.98	22,419.91
		Summer Demand Reduction (MW)	0.0000	1.1602	0.5801	0.5801	0.5801	2.9005
		Winter Demand Reduction (MW)	0.0000	1.1602	0.5801	0.5801	0.5801	2.9005
		Projected Participation	0	2	1	1	1	5
Custom Other	Custom	Energy Savings (MWh)	4,919.05	10,248.02	11,887.71	10,248.02	6,148.81	43,451.61
		Summer Demand Reduction (MW)	0.7086	1.4763	1.7125	1.4763	0.8858	6.2594
		Winter Demand Reduction (MW)	0.7086	1.4763	1.7125	1.4763	0.8858	6.2594
		Projected Participation	12	25	29	25	15	106
Virtual RCx	Custom	Energy Savings (MWh)	1,495.00	4,485.00	4,945.00	4,945.00	4,025.00	19,895.00
		Summer Demand Reduction (MW)	0.2163	0.6489	0.7155	0.7155	0.5824	2.8785
		Winter Demand Reduction (MW)	0.2163	0.6489	0.7155	0.7155	0.5824	2.8785
		Projected Participation	13	39	43	43	35	173
Benchmarking	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	50	100	125	100	50	425
Financing Buy Down	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	13	14	15	12	3	57
Facility Assessments	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	12	12	12	12	6	54
Technical Audits/Feasibility Studies	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	3	5	7	10	5	30
C&I Load Shift	3.12.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.00	4.08	6.12	0.00	0.00	2.0391
		Winter Demand Reduction (MW)	0.00	4.08	6.12	0.00	0.00	2.0391
		Projected Participation	0	2	3	0	0	3

¹Total values may not equal the sum of all program year values due to rounding.

²Projected participation is based on the unit value for the corresponding measure in Table 46.

Table 49. Pa PUC Table 9 – Large C&I Estimated Savings and Participation

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Lighting Retrofits - Interior	3.1.1	Energy Savings (MWh)	15,949.77	15,499.91	15,036.87	14,888.37	13,770.67	75,145.59
		Summer Demand Reduction (MW)	2.6192	2.5914	2.5136	2.4796	2.3289	12.5328
		Winter Demand Reduction (MW)	1.5277	1.5157	1.4702	1.4495	1.3645	7.3276
		Projected Participation ²	67,915	65,910	63,931	64,992	62,148	324,896
New Construction Lighting	3.1.2	Energy Savings (MWh)	2,878.57	2,878.57	2,698.66	2,878.57	2,878.57	14,212.93
		Summer Demand Reduction (MW)	0.5125	0.5125	0.4804	0.5125	0.5125	2.5304
		Winter Demand Reduction (MW)	0.5123	0.5123	0.4803	0.5123	0.5123	2.5294
		Projected Participation	16	16	15	16	16	79
Lighting Controls	3.1.3	Energy Savings (MWh)	330.74	330.74	318.97	330.74	330.74	1,641.91
		Summer Demand Reduction (MW)	0.0633	0.0633	0.0610	0.0633	0.0633	0.3140
		Winter Demand Reduction (MW)	0.0472	0.0472	0.0456	0.0472	0.0472	0.2345
		Projected Participation	434	434	422	434	434	2,158
LED Exit Signs	3.1.4	Energy Savings (MWh)	4.14	4.14	3.87	2.21	1.66	16.02
		Summer Demand Reduction (MW)	0.0005	0.0005	0.0005	0.0003	0.0002	0.0021
		Winter Demand Reduction (MW)	0.0005	0.0005	0.0005	0.0003	0.0002	0.0019
		Projected Participation	15	15	14	8	6	58
LED Refrigeration Display Case Lighting	3.1.5	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.62	0.62
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
		Projected Participation	0	0	0	0	1	1

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Midstream Lighting	3.1.6	Energy Savings (MWh)	8,836.36	8,569.82	8,394.40	7,954.34	7,510.29	41,265.22
		Summer Demand Reduction (MW)	2.2666	2.1985	2.1531	2.0398	1.9263	10.5843
		Winter Demand Reduction (MW)	2.2547	2.1868	2.1419	2.0294	1.9163	10.5292
		Projected Participation	68,188	66,141	64,779	61,372	57,958	318,438
Indoor Horticultural Lighting	3.1.7	Energy Savings (MWh)	0.00	442.72	486.99	929.71	442.72	2,302.14
		Summer Demand Reduction (MW)	0.0000	0.0933	0.1026	0.1960	0.0933	0.4852
		Winter Demand Reduction (MW)	0.0000	0.0933	0.1026	0.1960	0.0933	0.4852
		Projected Participation	0	1	2	3	1	7
ASHP and Air Source AC	3.2.1	Energy Savings (MWh)	32.60	6.08	17.06	13.99	23.10	92.82
		Summer Demand Reduction (MW)	0.0107	0.0020	0.0056	0.0041	0.0073	0.0297
		Winter Demand Reduction (MW)	0.0137	0.0019	0.0051	0.0069	0.0088	0.0364
		Projected Participation	14	5	10	9	12	50
ASHP and Air Source AC - Midstream	3.2.2	Energy Savings (MWh)	0.00	132.98	132.98	132.98	0.00	398.95
		Summer Demand Reduction (MW)	0.0000	0.0443	0.0443	0.0443	0.0000	0.1329
		Winter Demand Reduction (MW)	0.0000	0.0558	0.0558	0.0558	0.0000	0.1675
		Projected Participation	0	56	56	56	0	168
Electric Chiller	3.2.3	Energy Savings (MWh)	0.00	0.00	105.56	0.00	0.00	105.56
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0453	0.0000	0.0000	0.0453
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0020	0.0000	0.0000	0.0020
		Projected Participation	0	0	4	0	0	4
	3.2.4	Energy Savings (MWh)	1.91	0.00	0.00	0.00	0.00	1.91
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Ground or Groundwater Source Heat Pump		Winter Demand Reduction (MW)	0.0007	0.0000	0.0000	0.0000	0.0000	0.0007
		Projected Participation	1	0	0	0	0	1
Ductless Mini-Split Heat Pump	3.2.5	Energy Savings (MWh)	4.74	4.74	4.74	4.74	4.74	23.70
		Summer Demand Reduction (MW)	0.0044	0.0044	0.0044	0.0044	0.0044	0.0218
		Winter Demand Reduction (MW)	0.0033	0.0033	0.0033	0.0033	0.0033	0.0166
		Projected Participation	5	5	5	5	5	25
Midstream Mini-Split Heat Pump	3.2.6	Energy Savings (MWh)	0.00	3.40	3.40	3.40	0.00	10.19
		Summer Demand Reduction (MW)	0.0000	0.0032	0.0032	0.0032	0.0000	0.0095
		Winter Demand Reduction (MW)	0.0000	0.0024	0.0024	0.0024	0.0000	0.0072
		Projected Participation	0	4	4	4	0	12
HVAC Tune Up	3.2.8	Energy Savings (MWh)	164.82	164.82	164.82	164.82	164.82	824.08
		Summer Demand Reduction (MW)	0.0503	0.0503	0.0503	0.0503	0.0503	0.2514
		Winter Demand Reduction (MW)	0.0405	0.0405	0.0405	0.0405	0.0405	0.2027
		Projected Participation	10	10	10	10	10	50
Room Air Conditioner	3.2.9	Energy Savings (MWh)	0.02	0.00	0.00	0.00	0.00	0.02
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
HVAC Controls: Guest Room Occupancy Sensor	3.2.10	Energy Savings (MWh)	0.43	0.86	0.86	0.43	0.43	3.00
		Summer Demand Reduction (MW)	0.0001	0.0002	0.0002	0.0001	0.0001	0.0008
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	1	2	2	1	1	7

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
HVAC Controls: Economizer	3.2.11	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Computer Room Air Conditioner	3.2.12	Energy Savings (MWh)	0.00	0.00	0.00	0.00	12.09	12.09
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0149	0.0149
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0149	0.0149
		Projected Participation	0	0	0	0	6	6
Electronically Commutated Plug Fans on Computer Room Air Conditioner/Handler	3.2.13	Energy Savings (MWh)	0.00	0.00	0.00	0.00	1.88	1.88
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002
		Projected Participation	0	0	0	0	1	1
VSD on Computer Room Air Conditioner or Handler Fan Motor	3.2.14	Energy Savings (MWh)	0.00	0.00	0.00	0.00	2.28	2.28
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003
		Projected Participation	0	0	0	0	1	1
Circulation Fan: High-Volume Low-Speed	3.2.15	Energy Savings (MWh)	13.36	13.36	13.36	13.36	13.36	66.78
		Summer Demand Reduction (MW)	0.0073	0.0073	0.0073	0.0073	0.0073	0.0364
		Winter Demand Reduction (MW)	0.0029	0.0029	0.0029	0.0029	0.0029	0.0145
		Projected Participation	3	3	3	3	3	15
Demand Controlled Ventilation	3.2.16	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	3	3
Advanced Rooftop Controls	3.2.17	Energy Savings (MWh)	2.59	0.00	0.00	0.00	2.59	5.19
		Summer Demand Reduction (MW)	0.0012	0.0000	0.0000	0.0000	0.0012	0.0023
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0001	0.0002
		Projected Participation	1	0	0	0	1	2
ENERGY STAR Connected Thermostat	3.2.18	Energy Savings (MWh)	0.62	0.32	0.16	0.32	0.16	1.59
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	2	2	1	2	1	8
Duct Sealing and Insulation	3.2.20	Energy Savings (MWh)	0.82	0.00	0.00	0.00	0.00	0.82
		Summer Demand Reduction (MW)	0.0004	0.0000	0.0000	0.0000	0.0000	0.0004
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Chilled Water Pipe Insulation	3.2.21	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Premium Efficiency Motors	3.3.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.13	0.13
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	5	5

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
VFD Improvements	3.3.2	Energy Savings (MWh)	281.54	281.54	334.95	281.54	281.54	1,461.10
		Summer Demand Reduction (MW)	0.0328	0.0328	0.0382	0.0328	0.0328	0.1692
		Winter Demand Reduction (MW)	0.0708	0.0708	0.0852	0.0708	0.0708	0.3683
		Projected Participation	9	9	10	9	9	46
ECM Circulating Fan	3.3.3	Energy Savings (MWh)	0.00	0.00	0.68	0.00	0.00	0.68
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
VSD on Kitchen Exhaust Fan	3.3.4	Energy Savings (MWh)	0.00	44.23	44.23	44.23	44.23	176.93
		Summer Demand Reduction (MW)	0.0000	0.0075	0.0075	0.0075	0.0075	0.0301
		Winter Demand Reduction (MW)	0.0000	0.0063	0.0063	0.0063	0.0063	0.0252
		Projected Participation	0	10	10	10	10	40
ECM Circulator Pump	3.3.5	Energy Savings (MWh)	0.00	0.00	5.17	0.00	0.00	5.17
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0011	0.0000	0.0000	0.0011
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0007	0.0000	0.0000	0.0007
		Projected Participation	0	0	2	0	0	2
High Efficiency Pumps	3.3.6	Energy Savings (MWh)	0.00	0.00	6.96	0.00	0.00	6.96
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0013	0.0000	0.0000	0.0013
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0010	0.0000	0.0000	0.0010
		Projected Participation	0	0	1	0	0	1
Heat Pump Water Heaters	3.4.1	Energy Savings (MWh)	0.00	0.00	2.73	0.00	0.00	2.73
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0009	0.0000	0.0000	0.0009

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0004	0.0000	0.0000	0.0004
		Projected Participation	0	0	1	0	0	1
Low Flow Pre-Rinse Spray Valves	3.4.2	Energy Savings (MWh)	2.07	2.07	2.07	2.07	2.07	10.35
		Summer Demand Reduction (MW)	0.0006	0.0006	0.0006	0.0006	0.0006	0.0029
		Winter Demand Reduction (MW)	0.0003	0.0003	0.0003	0.0003	0.0003	0.0016
		Projected Participation	1	1	1	1	1	5
Domestic Hot Water Pipe Insulation	3.4.3	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
ENERGY STAR Freezer Case	3.5.1	Energy Savings (MWh)	2.59	5.18	5.18	5.18	5.18	23.30
		Summer Demand Reduction (MW)	0.0003	0.0007	0.0007	0.0007	0.0007	0.0030
		Winter Demand Reduction (MW)	0.0003	0.0007	0.0007	0.0007	0.0007	0.0030
		Projected Participation	6	12	12	12	12	54
High Efficiency Evaporator Fan Motors for Walk-in or Reach-in Cases	3.5.2	Energy Savings (MWh)	7.80	8.77	8.77	8.77	7.80	41.91
		Summer Demand Reduction (MW)	0.0010	0.0011	0.0011	0.0011	0.0010	0.0052
		Winter Demand Reduction (MW)	0.0010	0.0011	0.0011	0.0011	0.0010	0.0052
		Projected Participation	8	9	9	9	8	43
Evaporator Fan Controllers	3.5.3	Energy Savings (MWh)	0.49	0.49	0.98	0.98	0.64	3.59
		Summer Demand Reduction (MW)	0.0002	0.0002	0.0004	0.0004	0.0002	0.0014
		Winter Demand Reduction (MW)	0.0002	0.0002	0.0004	0.0004	0.0002	0.0014
		Projected Participation	2	2	4	4	3	15

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Floating Head Pressure Control	3.5.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.58	0.58
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Anti-Sweat Heater Control	3.5.5	Energy Savings (MWh)	2.93	5.86	5.86	5.86	2.93	23.45
		Summer Demand Reduction (MW)	0.0001	0.0002	0.0002	0.0002	0.0001	0.0009
		Winter Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0006
		Projected Participation	1	2	2	2	1	8
Evaporator Coil Defrost Control	3.5.6	Energy Savings (MWh)	0.15	0.31	0.31	0.31	0.31	1.39
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	2	2	2	2	9
Variable Speed Refrigeration Compressor	3.5.7	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.70	0.70
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
Strip Curtains for Walk-in Cooler or Freezer	3.5.8	Energy Savings (MWh)	12.75	12.75	18.63	12.75	12.75	69.64
		Summer Demand Reduction (MW)	0.0023	0.0023	0.0034	0.0023	0.0023	0.0124
		Winter Demand Reduction (MW)	0.0023	0.0023	0.0034	0.0023	0.0023	0.0124
		Projected Participation	1	1	4	1	1	8
Night Covers for Display Cases	3.5.9	Energy Savings (MWh)	0.00	0.00	4.35	0.00	0.00	4.35
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	2	0	0	2
Auto Closer for Cooler or Freezer	3.5.10	Energy Savings (MWh)	0.00	0.00	3.88	0.00	0.00	3.88
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0011	0.0000	0.0000	0.0011
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0011	0.0000	0.0000	0.0011
		Projected Participation	0	0	2	0	0	2
Door with Low or No Anti-Sweat Heat for Reach-In Cooler or Freezer	3.5.11	Energy Savings (MWh)	0.00	0.00	0.83	0.00	0.00	0.83
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Projected Participation	0	0	2	0	0	2
Suction Pipe Insulation for Walk-In Cooler or Freezer	3.5.12	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.16	0.16
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Refrigerated Display Case with Doors Replacing Open Case	3.5.13	Energy Savings (MWh)	0.00	0.00	0.00	0.00	80.73	80.73
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	-0.0017	-0.0017
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0341	0.0341
		Projected Participation	0	0	0	0	220	220
Adding Doors to Existing Refrigerated Display Case	3.5.14	Energy Savings (MWh)	0.00	0.00	0.00	0.00	68.84	68.84
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	-0.0032	-0.0032
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0285	0.0285
		Projected Participation	0	0	0	0	220	220

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Refrigerated Case Light Occupancy Sensors	3.5.15	Energy Savings (MWh)	0.00	0.00	0.05	0.00	0.00	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
Novelty Cooler Shutoff Timer	3.5.16	Energy Savings (MWh)	0.00	0.00	0.07	0.00	0.00	0.07
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
ENERGY STAR Clothes Washer	3.6.1	Energy Savings (MWh)	0.00	0.00	0.32	0.00	0.00	0.32
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Projected Participation	0	0	3	0	0	3
ENERGY STAR Bathroom Ventilation Fan in Commercial Application	3.6.2	Energy Savings (MWh)	0.00	0.00	0.06	0.00	0.00	0.06
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
ENERGY STAR Ice Machines	3.7.1	Energy Savings (MWh)	0.00	1.79	0.00	0.90	0.00	2.69
		Summer Demand Reduction (MW)	0.0000	0.0002	0.0000	0.0001	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
		Projected Participation	0	2	0	1	0	3
Beverage and Snack Machine Controls	3.7.2	Energy Savings (MWh)	0.00	0.54	0.00	0.00	0.00	0.54
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	2	0	0	0	2
ENERGY STAR Electric Steam Cooker	3.7.3	Energy Savings (MWh)	0.00	11.94	0.00	5.97	0.00	17.91
		Summer Demand Reduction (MW)	0.0000	0.0024	0.0000	0.0012	0.0000	0.0037
		Winter Demand Reduction (MW)	0.0000	0.0016	0.0000	0.0008	0.0000	0.0023
		Projected Participation	0	2	0	1	0	3
ENERGY STAR Combination Oven	3.7.4	Energy Savings (MWh)	0.45	0.45	0.08	0.00	0.08	1.05
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0000	0.0000	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0001	0.0001	0.0000	0.0000	0.0000	0.0001
		Projected Participation	3	3	1	0	1	8
ENERGY STAR Commercial Convection Oven	3.7.5	Energy Savings (MWh)	6.29	6.29	0.00	0.00	0.00	12.58
		Summer Demand Reduction (MW)	0.0013	0.0013	0.0000	0.0000	0.0000	0.0026
		Winter Demand Reduction (MW)	0.0008	0.0008	0.0000	0.0000	0.0000	0.0016
		Projected Participation	3	3	0	0	0	6
ENERGY STAR Commercial Fryer	3.7.6	Energy Savings (MWh)	2.33	2.33	0.00	0.00	0.00	4.65
		Summer Demand Reduction (MW)	0.0005	0.0005	0.0000	0.0000	0.0000	0.0009
		Winter Demand Reduction (MW)	0.0003	0.0003	0.0000	0.0000	0.0000	0.0006
		Projected Participation	2	2	0	0	0	4
ENERGY STAR Commercial Hot Food Holding Cabinet	3.7.7	Energy Savings (MWh)	5.14	5.14	0.00	0.00	0.00	10.28
		Summer Demand Reduction (MW)	0.0010	0.0010	0.0000	0.0000	0.0000	0.0021
		Winter Demand Reduction (MW)	0.0007	0.0007	0.0000	0.0000	0.0000	0.0013
		Projected Participation	3	3	0	0	0	6

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
ENERGY STAR Commercial Dishwasher	3.7.8	Energy Savings (MWh)	3.94	17.31	121.91	33.89	10.92	187.97
		Summer Demand Reduction (MW)	0.0008	0.0035	0.0248	0.0069	0.0022	0.0383
		Winter Demand Reduction (MW)	0.0005	0.0023	0.0162	0.0044	0.0014	0.0248
		Projected Participation	1	1	9	2	1	14
ENERGY STAR Commercial Griddle	3.7.9	Energy Savings (MWh)	0.00	0.00	5.73	0.00	0.00	5.73
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0012	0.0000	0.0000	0.0012
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0007	0.0000	0.0000	0.0007
		Projected Participation	0	0	2	0	0	2
Commercial Induction Cooktops	3.7.10	Energy Savings (MWh)	0.00	0.00	0.01	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
Ceiling & Wall Insulation	3.8.1	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	2	2
Advanced Power Strips	3.9.1	Energy Savings (MWh)	0.00	0.00	0.00	0.08	0.00	0.08
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	1	0	1
ENERGY STAR Server	3.9.2	Energy Savings (MWh)	0.00	0.00	0.00	15.68	0.00	15.68
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0020	0.0000	0.0020

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0021	0.0000	0.0021
		Projected Participation	0	0	0	3	0	3
Server Virtualization	3.9.3	Energy Savings (MWh)	0.00	0.00	0.00	0.46	0.00	0.46
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
		Projected Participation	0	0	0	1	0	1
Cycling Refrigerated Thermal Mass Dryer	3.10.1	Energy Savings (MWh)	0.00	1.82	1.82	1.82	1.82	7.28
		Summer Demand Reduction (MW)	0.0000	0.0004	0.0004	0.0004	0.0004	0.0016
		Winter Demand Reduction (MW)	0.0000	0.0005	0.0005	0.0005	0.0005	0.0019
		Projected Participation	0	60	60	60	60	240
Air-Entraining Air Nozzle	3.10.2	Energy Savings (MWh)	0.00	0.00	1.49	0.00	0.00	1.49
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0003	0.0000	0.0000	0.0003
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0004	0.0000	0.0000	0.0004
		Projected Participation	0	0	2	0	0	2
No-Loss Condensate Drain	3.10.3	Energy Savings (MWh)	0.00	0.00	1.21	0.00	0.00	1.21
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0003	0.0000	0.0000	0.0003
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0003	0.0000	0.0000	0.0003
		Projected Participation	0	0	1	0	0	1
Air Tanks for Load/No Load Compressors	3.10.4	Energy Savings (MWh)	0.00	3.35	3.35	3.35	31.92	41.98
		Summer Demand Reduction (MW)	0.0000	0.0007	0.0007	0.0007	0.0082	0.0104
		Winter Demand Reduction (MW)	0.0000	0.0007	0.0007	0.0007	0.0082	0.0104
		Projected Participation	0	15	15	15	16	61

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Variable-Speed Drive Air Compressor	3.10.5	Energy Savings (MWh)	326.38	326.38	326.38	326.38	326.38	1,631.88
		Summer Demand Reduction (MW)	0.0719	0.0719	0.0719	0.0719	0.0719	0.3593
		Winter Demand Reduction (MW)	0.0719	0.0719	0.0719	0.0719	0.0719	0.3593
		Projected Participation	72	72	72	72	72	360
Compressed Air Controller	3.10.6	Energy Savings (MWh)	0.00	2.24	2.24	2.24	2.24	8.94
		Summer Demand Reduction (MW)	0.0000	0.0005	0.0005	0.0005	0.0005	0.0020
		Winter Demand Reduction (MW)	0.0000	0.0005	0.0005	0.0005	0.0005	0.0020
		Projected Participation	0	20	20	20	20	80
Compressed Air Low Pressure Drop Filters	3.10.7	Energy Savings (MWh)	0.00	0.72	0.72	0.72	0.72	2.90
		Summer Demand Reduction (MW)	0.0000	0.0002	0.0002	0.0002	0.0002	0.0006
		Winter Demand Reduction (MW)	0.0000	0.0002	0.0002	0.0002	0.0002	0.0006
		Projected Participation	0	30	30	30	30	120
Compressed Air Mist Eliminations	3.10.8	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.05	0.05
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	0	0	1	1
High Efficiency Transformer	3.11.1	Energy Savings (MWh)	0.49	0.99	0.49	0.49	0.49	2.96
		Summer Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004
		Winter Demand Reduction (MW)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004
		Projected Participation	1	2	1	1	1	6
Engine Block Heater Timer	3.11.2	Energy Savings (MWh)	0.00	0.00	0.80	0.00	0.00	0.80
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
High Frequency Battery Chargers	3.11.3	Energy Savings (MWh)	3.50	5.25	5.25	3.50	1.75	19.26
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	2	3	3	2	1	11
Uninterruptible Power Supply (UPS)	3.11.4	Energy Savings (MWh)	0.00	0.00	0.45	0.00	0.00	0.45
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	3	0	0	3
Building Operator Certification Training	3.11.5	Energy Savings (MWh)	1,167.59	1,167.59	934.07	700.55	467.04	4,436.84
		Summer Demand Reduction (MW)	0.0850	0.0850	0.0680	0.0510	0.0340	0.3229
		Winter Demand Reduction (MW)	0.0600	0.0600	0.0480	0.0360	0.0240	0.2281
		Projected Participation	50	50	40	30	20	190
Photovoltaic (PV) Solar Generation	3.11.6	Energy Savings (MWh)	8,192.13	10,532.73	17,554.56	8,192.13	4,681.21	49,152.75
		Summer Demand Reduction (MW)	2.8398	3.6512	6.0854	2.8398	1.6228	17.0390
		Winter Demand Reduction (MW)	0.4427	0.5692	0.9487	0.4427	0.2530	2.6563
		Projected Participation	7	9	15	7	4	42
Automatic Milker Takeoffs	4.1.1	Energy Savings (MWh)	0.00	0.00	3.38	0.00	0.00	3.38
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0006	0.0000	0.0000	0.0006
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0006	0.0000	0.0000	0.0006
		Projected Participation	0	0	1	0	0	1

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Dairy Scroll Compressors	4.1.2	Energy Savings (MWh)	0.00	0.00	0.79	0.00	0.00	0.79
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
		Projected Participation	0	0	1	0	0	1
Ag High-Efficiency Ventilation Fans With and Without Thermostats	4.1.3	Energy Savings (MWh)	0.00	0.00	2.24	0.00	0.00	2.24
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0005	0.0000	0.0000	0.0005
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	2	0	0	2
Ag Heat Reclaimers	4.1.4	Energy Savings (MWh)	0.00	0.00	7.12	0.00	0.00	7.12
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0013	0.0000	0.0000	0.0013
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0014	0.0000	0.0000	0.0014
		Projected Participation	0	0	2	0	0	2
Ag High Volume Low Speed Fans	4.1.5	Energy Savings (MWh)	303.28	314.92	330.45	314.92	314.92	1,578.49
		Summer Demand Reduction (MW)	0.1572	0.1632	0.1712	0.1632	0.1632	0.8180
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	31	32	34	32	32	161
Livestock Waterer	4.1.6	Energy Savings (MWh)	0.00	0.00	0.65	0.00	0.00	0.65
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0004	0.0000	0.0000	0.0004
		Projected Participation	0	0	1	0	0	1
Variable Speed Drive (VSD) Controller on	4.1.7	Energy Savings (MWh)	0.00	0.00	19.98	0.00	0.00	19.98
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Dairy Vacuum Pumps		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	2	0	0	2
Low Pressure Irrigation System	4.1.8	Energy Savings (MWh)	0.00	0.00	0.31	0.00	0.00	0.31
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0009	0.0000	0.0000	0.0009
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	0	0	1	0	0	1
CUSTOM HVAC	Custom	Energy Savings (MWh)	678.59	678.59	678.59	678.59	678.59	3,392.93
		Summer Demand Reduction (MW)	0.1252	0.1252	0.1252	0.1252	0.1252	0.6259
		Winter Demand Reduction (MW)	0.0013	0.0013	0.0013	0.0013	0.0013	0.0063
		Projected Participation	3	3	3	3	3	15
CUSTOM AGRICULTURE	Custom	Energy Savings (MWh)	419.64	419.64	419.64	1,258.92	1,258.92	3,776.76
		Summer Demand Reduction (MW)	0.0881	0.0881	0.0881	0.2642	0.2642	0.7926
		Winter Demand Reduction (MW)	0.0881	0.0881	0.0881	0.2642	0.2642	0.7926
		Projected Participation	1	1	1	3	3	9
CUSTOM MOTORS / COMPRESSED AIR	Custom	Energy Savings (MWh)	3,410.01	3,410.01	3,410.01	3,410.01	3,410.01	17,050.05
		Summer Demand Reduction (MW)	0.4874	0.4874	0.4874	0.4874	0.4874	2.4369
		Winter Demand Reduction (MW)	0.4874	0.4874	0.4874	0.4874	0.4874	2.4369
		Projected Participation	8	8	8	8	8	40
CUSTOM REFRIGERATION	Custom	Energy Savings (MWh)	2,269.55	2,269.55	2,269.55	2,269.55	2,269.55	11,347.75
		Summer Demand Reduction (MW)	0.3173	0.3173	0.3173	0.3173	0.3173	1.5864
		Winter Demand Reduction (MW)	0.1269	0.1269	0.1269	0.1269	0.1269	0.6345
		Projected Participation	5	5	5	5	5	25

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
Custom CHP	Custom	Energy Savings (MWh)	0.00	7,540.60	7,540.60	15,081.20	7,540.60	37,702.99
		Summer Demand Reduction (MW)	0.0000	1.0808	1.0808	2.1616	1.0808	5.4039
		Winter Demand Reduction (MW)	0.0000	1.0808	1.0808	2.1616	1.0808	5.4039
		Projected Participation	0	1	1	2	1	5
Custom Other	Custom	Energy Savings (MWh)	4,099.21	9,018.26	10,248.02	9,018.26	6,148.81	38,532.56
		Summer Demand Reduction (MW)	0.5905	1.2991	1.4763	1.2991	0.8858	5.5508
		Winter Demand Reduction (MW)	0.5905	1.2991	1.4763	1.2991	0.8858	5.5508
		Projected Participation	10	22	25	22	15	94
Financing Buy Down	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	1	1	1	0	4
Technical Audits/Feasibility Studies	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	8	12	15	10	5	50
Strategic Energy Management	Custom	Energy Savings (MWh)	1,001.75	1,803.15	3,005.25	3,806.65	4,407.70	14,024.50
		Summer Demand Reduction (MW)	0.1573	0.2831	0.4718	0.5976	0.6919	2.2015
		Winter Demand Reduction (MW)	0.1573	0.2831	0.4718	0.5976	0.6919	2.2015
		Projected Participation	5	9	15	19	22	70
Compressed Air Challenge	Custom	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total ¹
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	10	10	10	10	10	50
C&I Load Shift	None	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.00	0.00	4.08	6.12	0.00	2.0391
		Winter Demand Reduction (MW)	0.00	0.00	4.08	6.12	0.00	2.0391
		Projected Participation	0	0	2	3	0	3

¹Total values may not equal the sum of all program year values due to rounding.

² Projected participation is based on the unit value for the corresponding measure in Table 47.

Business Pilot Programs

Description

PPL Electric Utilities may allot up to \$1 million total, inclusive of small and large C&I customers, for a C&I Peak Load Shift Pilot. Given the lack of market data on C&I daily load shifting, a key research question will be to understand if C&I daily load shifting is cost-effective in the Company's territory, while assessing customer experience and cost-effectiveness to inform a potential expanded program. The CSP will recruit a cohort to participate in the pilot by leveraging existing building management systems, process load control, battery storage, thermal storage, on-site generation, or other methodologies. Metrics to be tracked will be determined by pilot design and technology employed, though they will include participation, customer satisfaction, customer utilized product or software viability, and cost-effectiveness. The pilot may run between 12 and 24 months, depending on the final pilot design. At the conclusion of the pilot, the EM&V CSP will include evaluation results as part of the annual reporting process. PPL Electric Utilities may choose to continue pilot programs, in alignment with stated Pa PUC directives on plan changes, and with contingency funding if it is determined that the program provides a benefit to customers and/or helps the Company meet compliance targets.

PPL Electric Utilities reserves the right to propose additional pilots as deemed necessary by the Company to demonstrate new technology, methods, program design, or for any other reason, utilizing allocated technology and pilot funding, as is allowable through the Commission's Implementation Order. All proposed pilots will be filed with the Commission for review, as is outlined in the Final Implementation Order.

3.5. Government, Non-Profit, and Institutional Sector

The Company's Business Energy Efficiency Program will again be offered to all large and small commercial and industrial customers, including those defined as government, non-profit, and institutional ("GNI"). PPL Electric Utilities has a history of completing projects and maintaining partnerships with healthcare facilities, educational organizations, and other GNI customers across our territory. PPL Electric Utilities has included measures applicable to a variety of GNI customers, dependent on end-use, and will develop communications and marketing strategies to ensure awareness of these offerings. Where applicable, the Company will work with the selected CSPs for tailored outreach, including in the master metered income-eligible multifamily space, to ensure housing authorities and other providers receive an opportunity to participate.

4. Program Management and Implementation Strategies

PPL Electric Utilities has successfully engaged customers, provided meaningful energy efficiency opportunities, and met every requirement set forth by the Pa PUC throughout the history of Act 129. As an organization, we have a wealth of applicable experience, community connections, strong relationships with key market actors, and high-performing CSPs that deliver a customer-centric implementation approach. The Company's EE&C staff will lead and manage our partners, CSPs, trade allies, and others, as we leverage these assets for a successful Phase V.

4.1. Overview of EDC Management and Implementation Strategies

4.1.1. Organization of Services

PPL Electric Utilities will partner with highly qualified, Pa-registered CSPs with a local presence and knowledge of the Commonwealth to provide all program implementation in Phase V. The Company will also leverage and grow existing partner networks, which include contractors, trade allies, distributors, raters, builders, and other critical market actors to educate customers, install measures, and ensure program success. The Company, where possible, will support the market through training, economic development, and educational opportunities to foster market transformation. In addition to program implementation CSPs, the Company will utilize a separate, independent third-party EM&V consultant to ensure accurate program reporting. Details about reporting and tracking systems are included in Section 5, and QA/QC and EM&V details are included in Section 6. PPL Electric Utilities will provide overall strategic management and oversight and will ensure adherence to the Plan and Pa PUC requirements at all times, as well as ensure a premier customer experience (see Table 50).

Table 50. Organizational Structure

Function	Responsible Organization(s)		
Plan Design	PPL Electric Utilities		
Research & Development			
Implementation & Marketing Strategy			
Overall Customer Care & Experience			
Database Management & Program Tracking			
Financial Review and Approval			
CSP Management & Coordination			
Trade Ally & Distributor Network Management	Residential Energy Efficiency Program CSP	Resource Constrained Energy Efficiency Program (Low-Income) CSP	Business Energy Efficiency Program CSP
Direct Program Marketing & Advertising			
Customer Verification, Intake & Routing			
Project Delivery			
Application Review & Approval			
Incentive Processing			
Energy Efficiency Related Customer Care			

Function	Responsible Organization(s)
QA/QC	Implementation CSPs, PPL Electric Utilities, and EM&V CSP
Measurement & Verification	
Evaluation and Pa PUC Annual/ Mid-Year Reports	EM&V CSP, PPL Electric Utilities

4.1.2. Risk Management

As noted elsewhere in this Plan, energy efficiency programs in the Commonwealth have a long history and a record of success in facilitating positive changes in the market, as well as updated efficiency standards. In the coming years, the Company agrees with the Pa PUC's assessment of likely higher upfront costs for comprehensive measures and less opportunity from low-cost, high-impact measures. There are significant uncertainties at the federal level with changes in structure, priorities, and funding, as well as standards management and programs, such as ENERGY STAR. The implementation environment for Phase V has created a number of potential risks; overall compliance targets may be lower, though they are no easier to accomplish.

Performance

As the Pa PUC's Market Potential Study indicated, Phase V will be heavily dependent on more comprehensive measures, such as HVAC, which have a higher barrier to entry. This creates a scenario where a variety of actors and market forces could potentially impact program, component, or channel performance. In addition, as PPL Electric Utilities noted during the Phase V Implementation Order comment period, the available demand response opportunities are not known or proven, as is the case with commercial and industrial peak load shifting. The Company has allocated additional resources for peak load shaving activities, including additional internal staff in the form of a Demand Response Program Manager, as well as a highly specialized subcontractor that is an industry leader in this critical space. As noted below in Section 4.1.4, PPL Electric Utilities has a variety of early warning capabilities that will be brought to bear to monitor, measure, and respond to performance issues, allowing the Company and CSPs to pivot where necessary. Our strong market actor relationships will give us early insight into coming changes, of which the Company may otherwise be unaware.

Technology

Technology is moving at ever-increasing speeds, including for clean energy, efficiency, and leveraging new data opportunities. This can cause market disruption and confusion. New technology is also often more expensive prior to full market adoption, though it can prove to be beneficial as EDCs prepare for future implementation, both later in Phase V and beyond. Understanding how these technologies can benefit consumers, as well as preventing potential disruption or confusion in the market, is essential. The Company plans to investigate several new technologies in Phase V through limited pilots with the potential for scaling. Details on all pilot programs can be found in Section 3. Finally, PPL Electric Utilities will continue to offer advanced education tools, such as the Energy Analyzer, which leverages customer

data, to educate and empower our customers to use energy safely and efficiently. As new opportunities arise, the Company will evaluate for inclusion in our offerings, with consultation with the SWE and/or Pa PUC.

Market

The cost of generation continues to accelerate, a cost outside of EDC's control. This has created concern in the market related to affordability. This is compounded by potential inflationary pressures that may create an environment where customer participation may be reduced due to upfront costs. The Company has considered this in our Plan and has included third-party financing options, a moderate-income tier within the residential program, as well as additional pathways of participation for income-eligible customers. The Company will also provide broad awareness campaigns related to energy efficiency offerings to promote customer awareness of cost-lowering energy efficiency offerings that can assist customers who are concerned about overall price increases.

Policy

Changes at the federal level, including supply chain disruptions due to tariffs, may make products unavailable or more costly. The Company stays in close contact with key market actors to understand product availability, costs, and other determinative metrics that can provide insight into the changing landscape. PPL Electric Utilities has adjusted our expected project completion times to account for this volatility, which ensures that our forecasts will remain accurate. The Company will continually monitor and adjust as needed.

Evaluation

There are multiple new elements within Phase V that create uncertainty in evaluation, especially related to demand response and peak load shifting. There are also new offerings where evaluation methodologies must be reviewed and approved, including conservation voltage reduction. PPL Electric Utilities will work closely with the EM&V CSP to ensure program activities are aligned with existing evaluation frameworks and new offerings have reviewed and approved evaluation plans to ensure appropriate reporting of savings.

4.1.3. Personnel Constraints

The Company maintains an appropriately sized internal staff to provide appropriate resources for all required activities, while contractually obligating and monitoring CSPs to maintain adequate staffing levels across all areas of program implementation. PPL Electric Utilities will also ensure consistent engagement with trade allies by providing meaningful training, education, program materials, and incentives to ensure participation throughout the phase. As an extension of our efforts in Phase IV, PPL Electric Utilities will expand our trade ally networks to include a new heat pump installer network, offering specialized training and incentives related to this core technology. Finally, the Company successfully kept all program and channel options available through the end of Phase IV, building trust with contractors, trade allies, and distributors, which in turn will encourage investment in the territory.

PPL Electric Utilities will continue to communicate in a transparent and timely manner, gathering actionable feedback from all partners through roundtables, surveys, and other forums, to ensure we are meeting the needs of those organizations that are instrumental to success in Phase V.

4.1.4. Early Warning Systems

PPL Electric Utilities is involved at every level of program implementation and evaluation, closely monitoring all financials, energy savings, participation, satisfaction, and performance. Daily, weekly, and monthly status updates, supported by robust CSP reporting and dashboards, will allow the Company to have real-time insight into program performance in a way that allows us to be proactive and make key decisions to avoid potential issues with compliance with Act 129. The Company also utilizes sophisticated modeling and forecasting approaches separate from our CSPs, which provide verification of progress and early warning capabilities. The Company will respond to changing market conditions by moving funding between channels and components, if necessary, always ensuring customer recovery by sector. If the Company determines that a specific change requires a major or minor plan change, the Company will follow the Pa PUCs established plan change process. PPL Electric Utilities will follow Commission guidance on EE&C plan changes whenever required.

4.1.5. Implementation Schedule and Milestones

PPL Electric Utilities has selected CSPs for EM&V, as well as the Residential, Business, and Resource Constrained Energy Efficiency Programs, though contracts were not finalized for program implementation vendors as of the filing deadline. All selected CSPs are returning incumbents from Phase IV, allowing for a seamless transition to Phase V. The Phase V EE&C Plan is required to be submitted to the Pa PUC by December 1, 2025, and the Company expects all programs to launch at the start of the phase on June 1, 2026. Annual reports will be submitted per the Phase V Implementation Order guidance until the conclusion of Phase V on May 31, 2031.

4.1.6. Stakeholder Engagement

PPL Electric Utilities will continue to update stakeholders twice annually through stakeholder presentations tied to the semiannual and annual reports, and as requested by individual stakeholders. The Company will also continue to host Act 129 information on a dedicated stakeholder website. This website may include the EE&C Plan, annual reports, and other information of potential interest to stakeholders. The Company will ensure that low-income advocates and stakeholders are aware of all stakeholder interaction opportunities, and the Company will encourage participation. PPL Electric Utilities will also make EE&C leadership available by request for additional meetings with low-income stakeholders.

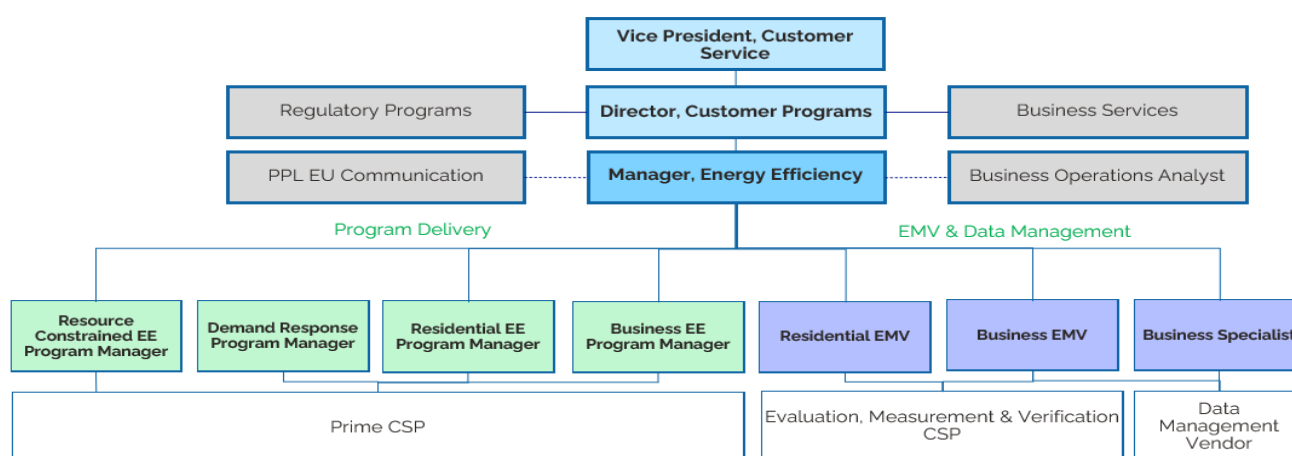
4.2. Executive Management Structure

4.2.1. EDC Structure

PPL Electric Utilities will continue to provide strategic oversight over all areas of Phase V programs, including the design and management of all programs, components, and channels, while also providing

overarching marketing and customer support and education. Critical to these functions is the Director of Customer Programs, responsible for Act 129 Energy Efficiency Programs, Regulatory Programs, and Business Services. The Manager of Energy Efficiency is the primary administrator for all Act 129 programs, including portfolio strategy, planning, budgeting and financial management, review of program metrics, development, implementation, operations, evaluation, reporting, and compliance with Act 129. These roles are supported by task-specific program managers responsible for program implementation, as well as sector-specific EM&V engineers responsible for quality assurance and control, and a database administrator for program tracking and reporting. The PPL Electric Utilities Communications team is responsible for external communications. The Company Supply team is ultimately responsible for procurement. Figure 1 summarizes the management structure for Phase V.

Figure 1. PPL Electric Utilities EE&C Plan Management Structure



4.2.2. CSP Performance

All CSPs and subcontractors providing services to PPL Electric Utilities will be contractually obligated to meet performance, customer satisfaction, cybersecurity, and every other applicable standard deemed appropriate by the Company to successfully support Act 129 implementation in Phase V. All partners will be actively monitored by Company staff through daily, weekly, and monthly reporting, dashboards, and both regular and *ad hoc* meetings. PPL Electric Utilities plans to use a single prime CSP with specialized subcontractors for both administrative efficiencies and cost savings, but also organizational consistency, transparency, and control. The EM&V CSP will independently evaluate all programs, components, and channels to verify reported savings, cost-effectiveness, customer satisfaction, and other key performance metrics. PPL Electric Utilities will update any aspect of the portfolio found to be underperforming as necessary.

4.2.3. Administrative Budgets

PPL Electric Utilities developed administrative budgets that include all EDC costs to develop, implement, and manage the Plan; direct staff labor and material costs, as well as full time equivalent hours of supporting labor, such as key account managers, CSP labor and materials, all marketing, QA/QC

activities, EM&V, tracking system, legal services, and SWE costs. The administrative budget excludes payments to customers/trade allies in the form of services, rebates, and/or incentives.

4.3. Conservation Service Providers

4.3.1. CSP Selection Process

PPL Electric Utilities issued RFPs for implementation CSPs (for Residential, Business, and Resource Constrained (Low-Income) Energy Efficiency Programs) and one CSP to provide EM&V. PPL Electric Utilities conducted its RFP processes in accordance with the procedures approved by the Commission. As of the date of the Phase V EE&C Plan's submission, PPL Electric Utilities is still preparing the implementation CSP contracts. The division of responsibilities between the Company and CSPs generally follows the successful framework from Phase IV. CSPs are selected primarily for implementation services, to ensure customer awareness, participation, forecasting, marketing insight, and properly attributed savings within Company-defined parameters, including specific budget limits. PPL Electric Utilities retains all strategic planning, program development, and design, as well as all internal EM&V activities. These EDC-specific activities cannot be done by a CSP, as that would lessen program oversight and control, as well as accountability.

4.3.2. CSPs Selected

The Company selected CLEAResult Consulting as the primary portfolio CSP for the Residential, Business, and Resource Constrained (Low-Income) Energy Efficiency Programs through a competitive bidding process. CLEAResult will subcontract key elements of the Resource Constrained Energy Efficiency Program to CMC Energy Services. In addition, the primary CSP will utilize other subcontractors for specific services, where appropriate, including for demand response activities. PPL Electric Utilities also selected Cadmus as the third-party EM&V CSP. All CSPs selected for Phase V are incumbents with a track record of successful program implementation in Pennsylvania, supporting PPL Electric Utilities to meet all compliance targets cost-effectively. All contracts, which are confidential, will be submitted to the Pa PUC for approval. PPL Electric Utilities does not plan to forego the competitive bidding process for any contract.

4.3.3. Pending CSP Contracts

PPL Electric Utilities will solicit bids from qualified and Pa-registered CSPs to provide overarching marketing support as well as database services. These RFPs were issued in the third and fourth quarter of 2025, respectively.

4.4. Coordination with Other State Conservation Programs

4.4.1. Collaboration Plans

The Company and selected CSP will work with all external program implementation vendor(s) to ensure the best possible customer experience and appropriate incentive allocation to reduce customer costs. Due to uncertainty around program viability and funding, PPL Electric Utilities' Plan is not dependent on

external coordination to meet goals, though it welcomes opportunities to recognize savings for which the Company's programs contribute applicable measures. This includes coordination with gas and water utilities within the Company's service territory, as applicable. No joint or coordinated marketing is planned for Phase V with any external, non-Company administered programs, though the Company may reference available external funding opportunities to customers, including the Penn Energy Savers website, to help educate customers on both Home Efficiency Rebates ("HER") and Home Electrification and Appliance Rebates ("HEAR") programs. For the HER program, the Company will provide and accept multifamily building leads to the program implementer, while also sharing program and customer data as directed by the Pa PUC and approved by the Company. PPL Electric Utilities may provide in-unit services and treatment to multifamily sites identified by the HER program implementer, claiming 100% savings for all Act 129-compliant energy reduction measures performed. The Company may contribute up to \$75,000 for the completion of American Society of Heating, Refrigerating and Air-Conditioning Engineers ("ASHRAE") level 2 audits, up to 100% of the audit costs, at up to ten properties where in-unit work is available and for which the Company can claim savings. This will create additional, low-administrative-burden benefits for customers. For HEAR, the Company may provide lead lists of prior Resource Constrained Single and Multifamily Assessment participants with fossil fuel heating, with a focus on trucked fuels such as propane and fuel oil. For projects with electric heat and/or water heating that exceed external limitations, and where both product and customers meet Resource Constrained Program eligibility, the Company may provide bridging funding to cover up to 100% of the cost of the measure while claiming applicable Act 129 energy and peak demand reductions. Coordination on data sharing requested by external program implementers for customer bill analysis will be provided as directed by the Pa PUC, and if approved by the Company based on customer data security considerations. If PPL Electric Utilities receives data related to outside funding on shared participants, either from the customer, vendor, or other agency, the Company will retain and report on this information, as is required. The Company will seek to minimize administrative burdens for customers while maximizing all available benefits to reduce project costs and extend funding availability.

4.4.2. Funding Availability

If provided with the requisite information, the Company will provide links to available external funding for Act 129 customers on Company or CSP-hosted websites and may provide leave-behind materials for program participants. Select information about external funding may be included in webinars, marketing and outreach materials, or through other means, as the Company deems appropriate and where such additions will not cause customer confusion or attribution concerns.

4.4.3. AEPS Registration Support

Customers participating in programs with measures that meet AEPS eligibility requirements will be provided with information on registration, encouragement to take advantage of available benefits, and technical assistance, if requested by the customer. This will be provided as part of an overall concierge service through the Business Energy Efficiency Program. The selected CSP will be provided with training

from the Company on appropriate protocols for providing AEPS registration support to eligible customers. The Company does not expect additional costs for this effort.

4.4.4. Health and Safety Issues

PPL Electric Utilities plans to allocate up to \$1.5 million to mitigate health and safety issues preventing comprehensive measure installation for income-eligible customers through the Resource Constrained Energy Efficiency Program. Based on the results of the Phase IV pilot, the Company forecasts that this amount will be adequate to address issues that arise for income-eligible customers within Act 129, though may allot additional funding if necessary and available, based on customer need. As always, PPL Electric Utilities will provide customers with applicable and helpful referrals to other agencies, as identified or requested.

4.4.5. Dual Participation Issues

PPL Electric Utilities will request aggregate, anonymous participation data, by sector, for external funding from known and available programs, through the program administrator or its agent, to calculate the leverage ratio for reporting. This will prevent potentially compromising customer information during data transfer and simplify reporting, while showing overall braiding performance. While the Company will request external program participation through surveys and/or application materials for additional verification purposes, relying on program participants to provide information concerning external program participation and/or funding is likely to lead to incomplete and/or inaccurate reporting. This approach does not preclude the Company's participation in additional data sharing activities, if agreed upon by the Company, through the data sharing working groups facilitated by the Pa PUC. PPL Electric Utilities will use the most appropriate, Company-approved, and available data collection method during each annual reporting period.

5. Reporting and Tracking System

5.1. Annual Reporting

PPL Electric Utilities will provide semiannual and annual reports to the Commission and/or SWE in accordance with the milestones outlined in Table 23 of the Pa PUC's Final Implementation Order. The Company will assess and respond to *ad hoc* reporting requests in good faith, as it is able.

5.2. Project Management Tracking System

5.2.1. Overview of System

PPL Electric Utilities will utilize a comprehensive tracking database provided by the selected database CSP to maintain a record of all program-relevant implementation activities, support evaluation and measurement efforts, and calculate reported savings. This database is supported by a Company accounting system that will be used to track Act 129 cost information, as well as various business intelligence and visualization applications. Together, these systems will allow for analysis and required reporting to all applicable entities.

5.2.2. Software Format, Database Structure, and Data Exchange

Software Format, Structure, and Functionality

The tracking database is a proprietary, secure environment that allows both the Company and implementation CSPs to input, track, calculate energy savings, review, approve, and report at multiple levels of detail. Key data will be collected, including but not limited to demographic information, account details, measure details, such as efficiency, life, cost, and count, building and equipment details, and more. The data collected is configurable at multiple levels, including measure level, ensuring alignment with the Pa TRM and data availability needed to ensure verification of energy savings.

The tracking database allows users to navigate and analyze various, customizable data layers and resolutions, such as measure, sector, project, program, component, and channel, through drop-down lists, menus, and various shortcuts. The system can provide standard, recurring, and customized reports for PPL Electric Utilities' day-to-day portfolio analysis and management.

5.2.3. CSP System Integration

PPL Electric Utilities' tracking system provides accessibility via web or direct links that are controlled via assigned security rights, while logging user access. CSPs and other authorized users can securely upload data and customer transactions, calculate and allocate energy savings, and extract data for external parties, such as the EM&V CSP and SWE. This data can be augmented through the digital storage of ancillary documentation. The system allows data parameters to be set for most data elements, which prevents user input errors while also providing alerts for potential duplicate submissions. All transactions and workflows are logged and are reportable, providing a comprehensive audit trail of activities.

5.2.4. Mechanism for Access for Pa PUC and Statewide Evaluator

Direct access will not be provided to the Pa PUC or the SWE because they would need significant training to understand and utilize the system appropriately. PPL Electric Utilities will provide data extracts as needed. The Company will fulfill all quarterly and annual data requests issued by the Commission and its SWE in a timely manner.

5.2.5. Cybersecurity

PPL Electric Utilities requires and utilizes robust cybersecurity policies, processes, software, and hardware to ensure that all sensitive information is kept secure. These requirements are also placed upon all CSPs, subcontractors, and vendors. All sensitive information must be kept confidential by CSPs and may not be used for any purpose other than performing or providing the energy efficiency-related products and services. Access to sensitive data is on a need-to-know basis only, and CSPs are responsible for ensuring that their employees, personnel, and subcontractors are authorized.

All Company-supplied customer data file transfers will be secure and encrypted. All CSPs and subcontractors will ensure that the necessary infrastructure and/or development is in place and active before receiving sensitive information to support the encryption methodology approved by the Company. If the Contractor utilizes subcontractors and shares Company data, subcontractors must encrypt files in the same manner, as well as follow the same policies and procedures. In addition, all CSPs will utilize the minimum number of fields in Company-supplied customer data files, only necessary to perform energy efficiency-related services.

6. Quality Assurance and Control

6.1.1. Approach to Quality Assurance and Control

PPL Electric Utilities' approach to quality assurance and control is an integral component of program success, working seamlessly to create an environment of continuous improvement that touches all aspects of program delivery – rebate processing, installation practices, customer experience, and energy savings verification. This ensures accurate, consistent, and participant-focused results. The Company's quality assurance process takes a proactive approach by embedding standards and protocols into CSP implementation workflows to prevent errors and promote consistency from the start. The quality control process complements this by focusing on post-implementation verification, identifying, and correcting issues that may impact energy savings accuracy or participant satisfaction. This results in a virtuous cycle of consistent design, excellent implementation, proper analysis of activities, and incremental improvements to inform future design and planning.

Quality Assurance

The Company's quality assurance process starts with standardized documents and eligibility requirements based on component and channel-level logic models. Building on this foundation, ongoing training is planned not only for CSPs but also for all participating contractors and trade allies to ensure correct and consistent installation, safe operation, and portfolio-wide best practices are utilized. All program staff, field teams, communications, trade allies, etc., will be rigorously screened, with additional scrutiny for those who interact directly with customers.

Quality assurance also includes validation of deemed and calculated savings algorithms, variables, and measure assumptions to ensure reported savings are built on accurate methodologies. PPL Electric Utilities' program administration staff will review and consult with the CSPs on program workflows to identify trends and opportunities for improvement for all documented data collection protocols, implementation activities, customer interactions and experience, etc.

Quality Control

PPL Electric Utilities' quality control function is a follow-up, verification-driven process that ensures program implementation meets all requirements, converting reported outcomes into verified results. The Company employs quality control functions that ensure program activities align with existing quality assurance procedures at all levels. Activities include desktop engineering review and verification of statistically valid samples to ensure submitted values and documentation support reported savings, which may include dates, customer sign-off, eligibility, incentive payments, energy savings calculations, and other project-specific data. This is supported by virtual and in-person field inspections to confirm equipment and product specifications, as well as appropriate installation best practices. Quality control teams will also reinforce post-installation participant education to ensure participants realize the benefits of the installation and the measure life is appropriate. Customer experience and satisfaction

will be continually monitored and evaluated using follow-up communications and surveys to identify opportunities to improve the effectiveness of all offerings.

6.2. Measure and Project Installation Verification, QA/QC, and Savings Documentation

PPL Electric Utilities documents and tracks all component, program, and portfolio activity through its participant tracking database, which can record and/or calculate reported gross energy savings. The Company designed the tracking system with input interfaces customized to individual components and coordinated with EM&V personnel so that they could collect appropriate data to feed into the evaluation processes and to meet the needs of the SWE. PPL Electric Utilities trains implementation CSPs to use the tracking system. In cases where a turnkey CSP delivers all aspects of a component, the Company will expect that the CSP track all activity via secure Internet access or upload. CSPs may also collect and store additional data required for evaluation in their internal tracking systems. The EM&V CSP will develop detailed EM&V plans describing all evaluation activities and sampling plans for the impact and process evaluations.

6.3. Process for Collecting and Addressing Feedback

PPL Electric Utilities provides the public, including stakeholders and customers, access to annual and semi-annual reports, stakeholder presentations, and our EE&C Plan on our Company website, along with contact information that allows for feedback. All CSPs' informational and participation websites also have customer feedback options, including phone, email, and web comments. All feedback is logged and receives a timely follow-up, if necessary.

In addition, the Company and EM&V CSP will implement an evaluation plan for each program and/or component, which may include customer and trade ally surveys as part of impact and process evaluations. This effort is supplemented by implementation CSP customer satisfaction surveys used for program enhancements.

6.4. Planned Market and Process Evaluations

The EM&V CSP will conduct process evaluations, designed to improve component operations and service delivery, for the PPL Electric Utilities program components. These evaluations provide insight into component performance and provide context for the impact evaluation results. In addition, the process evaluations highlight areas of achievement or areas of opportunity, alignment with program logic models, and effectiveness in measure adoption, market impacts, and customer satisfaction. This may lead to better identification of market barriers and improve overall market penetration for each component. The process evaluations will be implemented in a manner that maximizes their program impact and provides adequate time for CSPs to make the recommended changes, where appropriate, and may vary by component and program year to ensure actionable results.

The process evaluation relies on documentation review, PPL Electric Utilities, and implementation CSP staff interviews, insights provided by key market actors (trade allies, distributors, manufacturers,

retailers, etc.), and participant and non-participant surveys. The EM&V CSP will design and implement survey sample plans to meet the necessary statistical confidence and precision that aligns with the Act 129 Evaluation Framework. Samples may be stratified by customer sector, market segment, project size, or other criteria as determined by the Company to ensure samples are representative of the populations.

In addition to the process evaluation, PPL Electric Utilities and/or the EM&V CSP may conduct internal research studies to complement the formal baseline and market potential studies completed by the SWE for the Pa PUC. The Company may update these studies to aid in program implementation throughout the phase.

6.5. Strategy for Coordinating with the Statewide Evaluator

PPL Electric Utilities and the EM&V CSP will align all efforts with the SWE's Phase V Evaluation Framework, including annual reporting, data formatting, and savings protocols. This includes adhering to the reporting and data calendar outlined in the Implementation Order.

The Company's impact evaluations are the primary method for verifying installation of all program measures and quantifying the energy consumption and peak demand reductions. The approach to measuring and verifying impacts will be in accordance with the Pa TRM and the Evaluation Framework, though methods may vary by program, component, sector, or other criteria, as is necessary. All Evaluation plans will be updated annually, if necessary, and will detail methodology, sampling, and verification, which will be reviewed for approval by the SWE.

PPL Electric Utilities will coordinate and attend quarterly and/or *ad hoc* working sessions with the SWE to discuss important updates, TRM-related issues, energy and peak demand savings approaches, or other critical matters. The Company and EM&V CSP will communicate with the SWE, where necessary, in an open and collaborative manner for clarification on various protocols, decisions, or any other relevant matter.

6.6. Process for Incorporating Code and Standards Changes

PPL Electric Utilities will follow all SWE guidance memos and directives regarding codes and standards, changes to the Pa TRM, or evaluation methodologies, as required. This includes any potential changes to ENERGY STAR. Updates to codes and standards generally make available products more efficient, thereby lowering available savings. As such, the Company will evaluate and update eligibility, incentive, or measure availability following any code or standard change impacting measures offered.

7. Cost Recovery Mechanism

7.1. EE&C Costs

EE&C plans cannot exceed 2% of the EDC's total annual revenue as of December 31, 2006. PPL Electric Utilities' total annual revenues for calendar year 2006 were approximately \$3 billion. Accordingly, the 2% cost cap established by Act 129 is approximately \$61.5 million annually, or \$307.5 million for Phase V. PPL Electric Utilities' stated budget for Phase V aligns with all requirements.

The Implementation Order states that the 2% budgetary cap applies to the EDC's annual budget and that certain implementation costs recoverable under Act 129 are not subject to the 2% cost cap, including PPL Electric Utilities' share of the costs for the SWE.

7.2. Plan to Fund EE&C Plan

PPL Electric Utilities will allocate the entirety of the available \$307.5 million budget on implementation, EM&V, and other related tasks in Phase V. This includes costs related to the development and modification of the EE&C Plan, as outlined in the Implementation Order. The Company proposes to amortize and recover those deferred costs ratably over the 60-month life of its Phase V EE&C Plan from June 1, 2026, through May 31, 2031.

7.3. Cost Recovery Tables

Table 51 shows a summary of PPL Electric Utilities' Phase V EE&C costs by sector and program.

Table 51. Pa PUC Table 11 – Summary of EE&C Costs by Sector and Program

Sector	EE&C Program	Cost Elements (\$)							Total Cost ¹	Expected Acquisition Cost (\$/MWh) ²	Levelized Cost (\$/MWh) ³	Expected Acquisition Cost (\$/MW)
		Incentives	Program Design	Admin-istrative	EDC Delivery Costs	CSP Delivery Fees	Marketing	Other ⁵				
Residential Portfolio (incl. Low-Income)	Residential Energy Efficiency Program	\$29,930,963	\$1,450,748	\$10,905,234	\$1,012,819	\$18,148,431	\$3,191,645	\$1,160,598	\$65,800,438	\$390	\$74	\$1,943,011
	Resource Constrained Program	\$28,585,742	\$770,411	\$5,571,527	\$600,000	\$11,545,223	\$1,671,725	\$607,270	\$49,351,899	\$653	\$43	\$4,505,063
	Small C&I Business Solutions	\$166,750	\$0	\$0	\$0	\$0	\$0	\$0	\$166,750	\$136	\$56	\$617,476
	Sector Total	\$58,683,455	\$2,221,159	\$16,476,761	\$1,612,819	\$29,693,654	\$4,863,370	\$1,767,868	\$115,319,087	\$470	\$63	\$3,378,300
Small C&I	Small C&I Business Solutions	\$53,647,997	\$1,660,645	\$11,420,813	\$1,303,905	\$14,159,646	\$4,676,933	\$2,283,249	\$89,153,188	\$179	\$75	\$1,086,114
	Residential Energy Efficiency Program	\$56,494	\$0	\$0	\$0	\$1,697,234	\$0	\$0	\$1,753,728	\$1,109	\$8	\$6,105,406
	Resource Constrained Program	\$582,500	\$0	\$0	\$0	\$0	\$0	\$0	\$582,500	\$1,518	\$1,396	N/A
	Sector Total	\$54,286,991	\$1,660,645	\$11,420,813	\$1,303,905	\$15,856,880	\$4,676,933	\$2,283,249	\$91,489,415	\$183	\$75	\$1,110,688
Large C&I	Large C&I Business Solutions	\$32,900,615	\$1,304,663	\$7,740,432	\$1,064,267	\$9,675,123	\$3,844,411	\$2,068,867	\$58,598,377	\$182	\$63	\$1,103,066
	Sector Total ⁴	\$32,900,615	\$1,304,663	\$7,740,432	\$1,064,267	\$9,675,123	\$3,844,411	\$2,068,867	\$58,598,377	\$182	\$63	\$1,103,066

¹ Common Costs are not included in this table.

² The numerator in the acquisition cost calculation is the full direct program cost. Acquisition costs based on first-year savings.

³ Levelized costs are lifetime.

⁴ Total values may not equal the sum of all sector values or cost elements due to rounding.

⁵ Indirect CSP Delivery Costs, e.g., fleet vehicles, subscriptions, IT.

Table 52 shows the allocation of common costs by customer sectors.

Table 52. Pa PUC Table 12 – Allocation of Common Costs to Applicable Customer Sectors

Common Cost Element	Total Cost (\$)	Basis for Cost Allocation	Sector Cost Allocation (\$)		
			Residential Incl. Low-Income)	Small C&I	Large C&I
Program Design	\$1,100,000	% of Direct Program Cost	\$477,949	\$379,185	\$242,866
Administrative	\$3,000,000	% of Direct Program Cost	\$1,303,498	\$1,034,141	\$662,361
EDC Delivery Costs	\$9,500,000	% of Direct Program Cost	\$4,127,743	\$3,274,781	\$2,097,476
Marketing	\$15,000,000	% of Direct Program Cost	\$6,517,489	\$5,170,707	\$3,311,804
EM&V	\$12,000,000	% of Direct Program Cost	\$5,213,991	\$4,136,566	\$2,649,443
Major Accounts	\$1,500,000	Estimated % of KAM time with customer sectors (excluding residential) ¹	\$0	\$450,000	\$1,050,000
Totals²	\$42,100,000		\$17,640,669	\$14,445,380	\$10,013,950
SWE Cost	\$5,000,000	% of Direct Program Cost	\$2,172,496	\$1,723,569	\$1,103,935

¹ KAM is Key Account Managers

² Total values may not equal the sum of all sector values or cost elements due to rounding.

Table 53 shows the overview of portfolio costs by sector.

Table 53. Pa PUC Table 13 – Summary of Portfolio EE&C Costs

Portfolio	Total Sector Portfolio-specific Costs	Total Common Costs	Total of All Costs
Residential (Including Low-Income)	\$115,319,087	\$17,640,669	\$132,959,756
Small C&I	\$91,489,415	\$14,445,380	\$105,934,796
Large C&I	\$58,598,377	\$10,013,950	\$68,612,328
Totals¹	\$265,406,880	\$42,100,000	\$307,506,880

¹ Total values may not equal the sum of all sector values or cost elements due to rounding.

The total resource costs by program and for the portfolio are included in Table 56 and Table 57 in Section 8.

7.4. Tariffs and Costs Recovery Mechanism

Section 2806.1(k)(1) of the Public Utility Code authorizes EDCs to recover the costs of their EE&C plan through a reconcilable adjustment clause under Section 1307 of the Public Utility Code. All programs in PPL Electric Utilities' EE&C Plan will benefit both generation rate shopping and non-shopping customers; the cost recovery mechanism cannot be bypassed. The Act 129 Compliance Rider for Phase V (ACR-V) will be calculated separately for PPL Electric Utilities' three major customer classes in a similar manner to Phase IV—residential, inclusive of low-income customers, small C&I, and large C&I. For residential

customers, PPL Electric Utilities will apply the cost recovery mechanism as a cents per kWh component of the distribution charge. For small C&I customers, the Company will apply the cost recovery mechanism as a cents per kWh charge as a separate line item on the customers' bills. For large C&I customers, PPL Electric Utilities will apply the cost recovery mechanism as a dollars per kW charge, as a separate line item on the customers' bills, where the demand (kW) is a customer's PJM peak load contribution (which may change yearly).

PPL Electric Utilities proposes to calculate the ACR-V on an annual basis according to the forecasted program costs that it anticipates it will incur during that Phase V program year. The Company will complete an annual reconciliation of the ACR-V for each customer class by comparing ACR-V revenues to actual expenses and will recover or refund any over- or under-collections in the next ACR-V year. If the Company determines that a customer class's ACR-V rate, if left unchanged, would result in a material over- or under-collection of Phase V Act 129 costs incurred or expected to be incurred during the current 12-month period, the Company, in its discretion, may file with the Commission for an interim revision of the ACR-V rate.

Program cost calculation methods and assumptions are described in Appendix B, in Section 10.2.

7.5. Customer Classes

Section 2806.1(a)(11) of the Public Utility Code requires that EE&C measures be paid for by the same customer class that receives the energy and peak demand reduction through demand response, or measures and conservation benefits. PPL Electric Utilities will directly assign costs to the customer class that receives the benefits of the EE&C measures whenever those costs can be directly assigned, regardless of program, component, or channel.

Certain costs, such as common costs and/or portfolio-level costs, relate to EE&C measures that are applicable to more than one customer class or that provide systemwide benefits. In Phases I, II, III, and IV, the Commission directed PPL Electric Utilities to allocate those costs and general administrative costs, using reasonable and generally acceptable cost of service principles that are commonly utilized in base rate proceedings. In Phase V, the Company will allocate such costs using an allocation factor equal to the percentage of the total actual EE&C costs directly assigned to each customer class.

7.6. Phase V Cost Accounting

PPL Electric Utilities will account for Phase V costs separately from those incurred in Phase IV or other phases using separate and distinct accounting numbers that correctly identify and organize charges by program, sector, and cost category. The Company will use different accounting numbers for Phase V from those used in prior phases. Any costs associated with energy efficiency measures installed and operable on or before May 31, 2026, will be accounted for as Phase IV costs. Any costs associated with energy efficiency measures installed and operable after May 31, 2026, will be accounted for as Phase V costs.

8. Cost Effectiveness

8.1. Avoided Cost Calculator

PPL Electric Utilities used the 2026 Avoided Cost Calculator provided by the SWE to calculate avoided costs and review the cost effectiveness of its Phase V EE&C Plan.¹ The Company calculated the avoided costs of delivered electricity for a 15-year planning horizon in three segments, as follows:

- **Years 1-4 (June 2027-May 2031).** The Company used the NYMEX Electricity Futures Price at the PJM West Hub as of July 7, 2025, and applied a locational basis adjustment from PJM West Hub to the Company's Zone.
- **Years 5-10 (June 2031-May 2037).** PPL Electric Utilities used NYMEX Henry Hub Natural Gas Futures and the EIA AEO Natural Gas Price Forecast for Mid-Atlantic Region as of July 7, 2025 and converted to electric prices using an on-peak and off-peak heat rate and spark spread.
- **Years 11-20 (June 2037-May 2046).** PPL Electric Utilities used Middle Atlantic Natural Gas Prices for Electric Power from the Energy Information Administration Annual Energy Outlook, Energy Prices by Sector and Source, converted to electric prices using the on-peak and off-peak heat rate and including on-peak and off-peak spark price spreads.

The Company estimated avoided generation capacity costs using PJM base residual auction results for 2026/2027. Subsequent years are inflated by the rate of inflation specified in the Phase V TRC Test Order. Avoided T&D costs are from the SWE Avoided Cost of Transmission and Distribution Capacity Study. Avoided transmission costs are escalated at the rate of inflation, but avoided distribution costs change by varying rates based on the outcomes of the probabilistic deferral analysis methodology.² Avoided T&D costs are provided by EDC and year in the 2026 Avoided Cost Calculator. Inflation rates and line loss values used in calculating avoided costs are summarized in Table 54.

Table 54. Inflation Rates and Line Loss Values Used in Avoided Costs and TRC Calculations

	Description	Rate and TRC
Inflation ¹	Avoided generation capacity costs	2.0%
	Avoided T&D costs	2.0%

¹ Pennsylvania Public Utility Commission. Accessed October 2025. "Total Resource Cost Test."
<https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/total-resource-cost-test/>

² Demand Side Analytics. July 2024. *Avoided Cost of Transmission and Distribution Capacity Study*.
<https://www.puc.pa.gov/pcdocs/1855615.pdf>

	Description	Rate and TRC
Line Losses ²	Energy	
	Residential	1.0875
	Commercial (Small C&I)	1.0875
	Industrial (Large C&I)	1.0420
	Demand	
	Residential	1.0875
	Commercial (Small C&I)	1.0875
	Industrial (Large C&I)	1.0420

¹ Inflation rates are consistent with the rate provided on page 15 of the Phase V TRC Test Order

² Line losses are consistent with those provided in the 2026 TRM Volume 1 Table 1-5. The line loss factor in this table represents meter to the generator.

Table 55 shows PPL Electric Utilities’ calculated avoided costs of delivered electricity for a 15-year planning horizon.

Table 55. Overall Avoided Costs (All Sectors)¹

Year	PPL Zone Summer (\$/MWh)		PPL Zone Winter (\$/MWh)		PPL DLC Zone Shoulder (\$/MWh)		PPL Generation Capacity (\$/kW/year)		PPL Transmission Capacity (\$/kW/year)		PPL Distribution Capacity (\$/kW/year)		Avoided Natural Gas Fuel Costs (\$/MMBTU)
	Summer On-Peak	Summer Off-Peak	Winter On-Peak	Winter Off-Peak	Shoulder On-Peak	Shoulder Off-Peak	Summer	Winter	Summer	Winter	Summer	Winter	
2027	\$82.19	\$59.95	\$97.91	\$86.11	\$74.95	\$62.96	\$99.25	\$99.25	\$48.00	\$48.00	\$25.11	\$32.44	\$0.78
2028	\$94.71	\$72.11	\$111.09	\$99.63	\$87.06	\$75.10	\$70.55	\$70.55	\$49.16	\$49.16	\$26.68	\$36.48	\$0.58
2029	\$104.92	\$81.35	\$121.85	\$109.70	\$97.04	\$84.42	\$72.36	\$72.36	\$50.35	\$50.35	\$29.00	\$39.40	\$0.43
2030	\$105.88	\$81.50	\$121.55	\$110.70	\$96.90	\$84.65	\$73.94	\$73.94	\$51.57	\$51.57	\$31.55	\$41.88	\$0.31
2031	\$65.59	\$44.21	\$108.67	\$90.96	\$58.97	\$48.39	\$33.15	\$33.15	\$52.82	\$52.82	\$33.94	\$44.30	\$0.49
2032	\$63.71	\$42.97	\$138.31	\$111.41	\$57.49	\$47.41	\$33.95	\$33.95	\$54.10	\$54.10	\$34.76	\$45.38	\$1.03
2033	\$59.77	\$40.30	\$174.33	\$136.27	\$55.08	\$45.80	\$34.77	\$34.77	\$55.41	\$55.41	\$35.60	\$46.48	\$1.61
2034	\$57.24	\$38.61	\$211.64	\$162.01	\$53.87	\$45.01	\$35.61	\$35.61	\$56.75	\$56.75	\$36.46	\$47.60	\$2.31
2035	\$55.40	\$37.39	\$249.55	\$188.16	\$53.45	\$44.78	\$36.48	\$36.48	\$58.12	\$58.12	\$37.35	\$48.76	\$3.07
2036	\$53.60	\$36.20	\$286.32	\$213.54	\$53.09	\$44.58	\$37.36	\$37.36	\$59.53	\$59.53	\$38.25	\$49.94	\$3.81
2037	\$52.00	\$35.15	\$318.87	\$236.01	\$52.65	\$44.33	\$38.27	\$38.27	\$60.97	\$60.97	\$39.18	\$51.15	\$4.46
2038	\$52.70	\$35.68	\$313.61	\$232.43	\$53.14	\$44.71	\$39.19	\$39.19	\$62.45	\$62.45	\$40.13	\$52.38	\$4.37
2039	\$53.27	\$36.13	\$309.66	\$229.77	\$53.55	\$45.05	\$40.14	\$40.14	\$63.96	\$63.96	\$41.10	\$53.65	\$4.30
2040	\$53.28	\$36.19	\$311.59	\$231.15	\$53.62	\$45.15	\$41.11	\$41.11	\$65.51	\$65.51	\$42.09	\$54.95	\$4.33
2041	\$52.68	\$35.83	\$319.74	\$236.82	\$53.33	\$45.01	\$42.11	\$42.11	\$67.10	\$67.10	\$43.11	\$56.28	\$4.46
2042	\$51.99	\$35.42	\$328.83	\$243.14	\$52.99	\$44.83	\$43.13	\$43.13	\$68.72	\$68.72	\$44.16	\$57.65	\$4.62
2043	\$51.29	\$34.99	\$338.19	\$249.64	\$52.63	\$44.64	\$44.17	\$44.17	\$70.39	\$70.39	\$45.23	\$59.04	\$4.78
2044	\$50.91	\$34.79	\$344.19	\$253.84	\$52.48	\$44.60	\$45.24	\$45.24	\$72.09	\$72.09	\$46.32	\$60.47	\$4.88
2045	\$50.70	\$34.70	\$348.53	\$256.88	\$52.43	\$44.62	\$46.34	\$46.34	\$73.84	\$73.84	\$47.45	\$61.94	\$4.95

2046	\$49.79	\$34.14	\$360.11	\$264.92	\$51.96	\$44.36	\$47.46	\$47.46	\$75.63	\$75.63	\$48.59	\$63.44	\$5.14

¹ Data in this table excludes avoided energy costs from the Arrearages study. Separate avoided costs were used for low income programs, in accordance with the Pa PUC 2026 Avoided Cost Calculator.

8.2. Real Discount and Nominal Discount Rates

PPL Electric Utilities applied a 3% real discount rate and a 5% nominal discount rate in TRC testing, as per the TRC Test Order (page 15).

8.3. TRC Cost Testing

As per the Pa PUC's Total Resource Cost Test Final Order, PPL Electric Utilities has developed a portfolio of programs that provides benefits greater than the cost to implement at the portfolio level. Historically, the Company has had very cost-effective programs, and through program year 16 of Phase IV, the Company has achieved a TRC ratio of 1.42. This promotes both energy consumption reduction as directed by the Pa PUC, while protecting customer affordability. PPL Electric Utilities has selected measures for Phase V that will be beneficial to customers, are in line with Act 129, and will allow the Company to continue to meet cost-effectiveness thresholds. The cost-effectiveness of the portfolio was demonstrated in the data presented in Table 55 for each program in the EE&C Plan; the Company has demonstrated that the Plan is cost-effective in accordance with the Commission's 2026 TRC Test Order. PPL Electric Utilities assessed the cost-effectiveness of each program in the Plan by quantifying the value of the total resource benefits ("TRC Benefits") over the life of each available measure, for a maximum of 15 years as directed in the 2026 TRC Test Order. The Company then determined each program's total resource costs ("TRC Costs") using the SWE Team Incremental Measure Cost Database and program delivery and administration costs. The 2026 TRC Test Order indicates that the portfolio of programs is cost-effective if its TRC Benefits exceed its TRC costs or the benefit/cost ratio is at least 1.0, as shown by the following equations: $\text{TRC Benefits} / \text{TRC Costs} \geq 1$ and $\text{TRC Benefits} - \text{TRC Costs} \geq 0$. The TRC Benefits data are estimates based on the planning assumptions in this EE&C Plan. The Company will utilize the 2026 TRC test to monitor programs and portfolio cost-effectiveness annually and ensure TRC results are above 1.0 at the portfolio level. Table 56 and Table 57 provide TRC benefits data for each program component and sector. Each table caption includes a reference to the corresponding table number provided in the EE&C plan template.

8.4. TRC Net and Gross Data Tables

Table 56 presents net TRC benefits by program and total portfolio, while Table 57 presents gross TRC benefits by program and total portfolio. Net benefits include 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, whereas gross benefits include all benefits that result directly from program-related actions taken by participants in an EE&C program, regardless of why they participated.

Table 56. Pa PUC Table 14A – Net TRC Benefits, By Program and Total Portfolio

Portfolio	NTGR & TRC Ratio			TRC Costs by Program Per Year (\$000)				TRC Benefits by Program Per Year (\$000)				
Program	Program Year	NTGR	Net TRC ^{1,2}	Incremental Measure Cost		Program Administration Cost	Total TRC Costs	Capacity Benefits	Energy Benefits	Fossil Fuel and Water Benefits	O&M Benefits	Total TRC Benefits
				Paid by EDC	Paid by Participants							
Residential Energy Efficiency Program	PY18	0.59	1.23	\$5,037	\$5,317	\$7,304	\$17,658	\$7,691	\$13,372	\$727	\$0.0	\$21,791
Residential Energy Efficiency Program	PY19	0.59	1.20	\$5,205	\$5,431	\$7,483	\$18,119	\$7,172	\$13,887	\$736	\$0.0	\$21,795
Residential Energy Efficiency Program	PY20	0.59	1.21	\$5,315	\$5,348	\$7,666	\$18,328	\$7,310	\$14,065	\$718	\$0.0	\$22,092
Residential Energy Efficiency Program	PY21	0.59	1.08	\$5,465	\$5,410	\$6,974	\$17,849	\$6,715	\$11,806	\$702	\$0.0	\$19,223
Residential Energy Efficiency Program	PY22	0.59	1.06	\$5,594	\$5,292	\$7,128	\$18,014	\$6,769	\$11,712	\$629	\$0.0	\$19,110
Residential Energy Efficiency Program	Total	0.59	1.16	\$26,616	\$26,798	\$36,554	\$89,968	\$35,658	\$64,841	\$3,512	\$0.0	\$104,012
Resource Constrained Program	PY18	1.0	2.47	\$6,163	\$120	\$4,403	\$10,685	\$5,036	\$20,713	\$605	\$0.0	\$26,353
Resource Constrained Program	PY19	1.0	2.42	\$5,635	\$120	\$4,232	\$9,987	\$4,511	\$19,059	\$583	\$0.0	\$24,153
Resource Constrained Program	PY20	1.0	2.54	\$5,778	\$120	\$4,067	\$9,965	\$4,688	\$20,002	\$608	\$0.0	\$25,298
Resource Constrained Program	PY21	1.0	2.50	\$5,336	\$120	\$3,842	\$9,299	\$4,330	\$18,343	\$608	\$0.0	\$23,281
Resource Constrained Program	PY22	1.0	2.31	\$4,260	\$120	\$3,622	\$8,001	\$3,512	\$14,340	\$603	\$0.0	\$18,455
Resource Constrained Program	Total	1.0	2.45	\$27,171	\$600	\$20,166	\$47,937	\$22,078	\$92,456	\$3,006	\$0.0	\$117,540
Small C&I Business Solutions	PY18	0.66	1.64	\$9,386	\$40,647	\$6,556	\$56,588	\$28,042	\$65,041	(\$248)	\$0.0	\$92,836
Small C&I Business Solutions	PY19	0.67	1.57	\$11,494	\$56,692	\$7,248	\$75,433	\$35,460	\$83,355	(\$271)	\$0.0	\$118,544

Portfolio	NTGR & TRC Ratio			TRC Costs by Program Per Year (\$000)				TRC Benefits by Program Per Year (\$000)				
Program	Program Year	NTGR	Net TRC ^{1,2}	Incremental Measure Cost		Program Administration Cost	Total TRC Costs	Capacity Benefits	Energy Benefits	Fossil Fuel and Water Benefits	O&M Benefits	Total TRC Benefits
				Paid by EDC	Paid by Participants							
Small C&I Business Solutions	PY20	0.67	1.65	\$11,223	\$53,500	\$7,172	\$71,895	\$35,702	\$82,861	(\$295)	\$0.0	\$118,268
Small C&I Business Solutions	PY21	0.67	1.69	\$9,754	\$45,952	\$6,569	\$62,276	\$30,601	\$74,928	(\$296)	\$0.0	\$105,233
Small C&I Business Solutions	PY22	0.67	1.75	\$7,618	\$34,326	\$5,657	\$47,601	\$24,003	\$59,644	(\$274)	\$0.1	\$83,373
Small C&I Business Solutions	Total	0.67	1.65	\$49,475	\$231,118	\$33,201	\$313,794	\$153,809	\$365,829	(\$1,384)	\$0.1	\$518,255
Large C&I Business Solutions	PY18	0.66	1.77	\$4,646	\$18,030	\$4,057	\$26,733	\$12,383	\$35,023	(\$107)	\$0.0	\$47,300
Large C&I Business Solutions	PY19	0.68	1.72	\$6,067	\$26,751	\$4,834	\$37,652	\$16,286	\$48,639	(\$116)	\$0.0	\$64,809
Large C&I Business Solutions	PY20	0.68	1.80	\$6,914	\$30,285	\$5,360	\$42,559	\$19,838	\$57,072	(\$126)	\$0.0	\$76,783
Large C&I Business Solutions	PY21	0.69	1.89	\$6,731	\$29,847	\$4,995	\$41,572	\$20,349	\$58,454	(\$138)	\$0.0	\$78,665
Large C&I Business Solutions	PY22	0.68	1.98	\$5,001	\$22,282	\$4,387	\$31,671	\$15,541	\$47,209	(\$143)	\$0.1	\$62,607
Large C&I Business Solutions	Total	0.68	1.83	\$29,358	\$127,195	\$23,633	\$180,187	\$84,397	\$246,396	(\$629)	\$0.1	\$330,164
Total³			1.69	\$132,620	\$385,711	\$113,555	\$631,887	\$295,942	\$769,523	\$4,506	\$0.3	\$1,069,971

¹ The TRC ratio compares the present value of the TRC benefits to the present value of the TRC costs with both costs and benefits expressed in \$2026.

² Does not include common portfolio costs; whereas Table 3 and Table 58 do.

³ Total values may not equal the sum of all program year or program values due to rounding.

Table 57. Pa PUC Table 14B – Gross TRC Benefits, By Program and Total Portfolio

Portfolio	NTGR & TRC Ratio			TRC Costs by Program Per Year (\$000)				TRC Benefits by Program Per Year (\$000)				
Program	Program Year	NTGR	Gross TRC ^{1,2}	Incremental Measure Cost		Program Administration Cost	Total TRC Costs	Capacity Benefits	Energy Benefits	Fossil Fuel and Water Benefits	O&M Benefits	Total TRC Benefits
				Paid by EDC	Paid by Participants							
Residential Energy Efficiency Program	PY18	1.0	1.45	\$5,037	\$12,272	\$7,304	\$24,613	\$11,420	\$22,979	\$1,194	\$0.0	\$35,592
Residential Energy Efficiency Program	PY19	1.0	1.42	\$5,205	\$12,594	\$7,483	\$25,282	\$10,843	\$23,842	\$1,209	\$0.0	\$35,894
Residential Energy Efficiency Program	PY20	1.0	1.43	\$5,315	\$12,585	\$7,666	\$25,565	\$11,059	\$24,247	\$1,193	\$0.0	\$36,499
Residential Energy Efficiency Program	PY21	1.0	1.25	\$5,465	\$12,824	\$6,974	\$25,264	\$9,969	\$20,334	\$1,165	\$0.0	\$31,469
Residential Energy Efficiency Program	PY22	1.0	1.23	\$5,594	\$12,731	\$7,128	\$25,453	\$10,004	\$20,170	\$1,040	\$0.0	\$31,214
Residential Energy Efficiency Program	Total	1.0	1.35	\$26,616	\$63,007	\$36,554	\$126,177	\$53,296	\$111,572	\$5,800	\$0.0	\$170,668
Resource Constrained Program	PY18	1.0	2.47	\$6,163	\$120	\$4,403	\$10,685	\$5,036	\$20,713	\$605	\$0.0	\$26,353
Resource Constrained Program	PY19	1.0	2.42	\$5,635	\$120	\$4,232	\$9,987	\$4,511	\$19,059	\$583	\$0.0	\$24,153
Resource Constrained Program	PY20	1.0	2.54	\$5,778	\$120	\$4,067	\$9,965	\$4,688	\$20,002	\$608	\$0.0	\$25,298
Resource Constrained Program	PY21	1.0	2.50	\$5,336	\$120	\$3,842	\$9,299	\$4,330	\$18,343	\$608	\$0.0	\$23,281
Resource Constrained Program	PY22	1.0	2.31	\$4,260	\$120	\$3,622	\$8,001	\$3,512	\$14,340	\$603	\$0.0	\$18,455
Resource Constrained Program	Total	1.0	2.45	\$27,171	\$600	\$20,166	\$47,937	\$22,078	\$92,456	\$3,006	\$0.0	\$117,540
Small C&I Business Solutions	PY18	1.0	1.71	\$9,386	\$66,855	\$6,556	\$82,796	\$42,964	\$99,261	(\$387)	\$0.0	\$141,838
Small C&I Business Solutions	PY19	1.0	1.63	\$11,494	\$90,235	\$7,248	\$108,976	\$53,154	\$125,351	(\$424)	\$0.0	\$178,081

Portfolio	NTGR & TRC Ratio			TRC Costs by Program Per Year (\$000)				TRC Benefits by Program Per Year (\$000)				
Program	Program Year	NTGR	Gross TRC ^{1,2}	Incremental Measure Cost		Program Administration Cost	Total TRC Costs	Capacity Benefits	Energy Benefits	Fossil Fuel and Water Benefits	O&M Benefits	Total TRC Benefits
				Paid by EDC	Paid by Participants							
Small C&I Business Solutions	PY20	1.0	1.71	\$11,223	\$85,646	\$7,172	\$104,040	\$53,356	\$124,878	(\$460)	\$0.0	\$177,774
Small C&I Business Solutions	PY21	1.0	1.77	\$9,754	\$73,335	\$6,569	\$89,659	\$46,215	\$112,560	(\$462)	\$0.0	\$158,312
Small C&I Business Solutions	PY22	1.0	1.84	\$7,618	\$54,841	\$5,657	\$68,116	\$36,202	\$89,422	(\$428)	\$0.2	\$125,196
Small C&I Business Solutions	Total	1.0	1.72	\$49,475	\$370,911	\$33,201	\$453,587	\$231,891	\$551,472	(\$2,162)	\$0.2	\$781,202
Large C&I Business Solutions	PY18	1.0	1.88	\$4,646	\$29,280	\$4,057	\$37,983	\$18,826	\$52,923	(\$167)	\$0.0	\$71,582
Large C&I Business Solutions	PY19	1.0	1.82	\$6,067	\$41,845	\$4,834	\$52,745	\$24,264	\$71,977	(\$181)	\$0.0	\$96,061
Large C&I Business Solutions	PY20	1.0	1.90	\$6,914	\$47,559	\$5,360	\$59,833	\$29,289	\$84,779	(\$197)	\$0.0	\$113,871
Large C&I Business Solutions	PY21	1.0	1.99	\$6,731	\$45,957	\$4,995	\$57,682	\$29,383	\$85,450	(\$215)	\$0.0	\$114,619
Large C&I Business Solutions	PY22	1.0	2.10	\$5,001	\$34,676	\$4,387	\$44,064	\$23,092	\$69,670	(\$223)	\$0.2	\$92,539
Large C&I Business Solutions	Total	1.0	1.94	\$29,358	\$199,316	\$23,633	\$252,308	\$124,855	\$364,799	(\$982)	\$0.2	\$488,672
Total³			1.77	\$132,620	\$633,834	\$113,555	\$880,010	\$432,120	\$1,120,299	\$5,662	\$0.4	\$1,558,081

¹ The TRC ratio compares the present value of the TRC benefits to the present value of the TRC costs with both costs and benefits expressed in \$2026.

² Does not include common portfolio costs; whereas Table 3 and Table 58 do.

³ Total values may not equal the sum of all program year or program values due to rounding.

Table 58 presents portfolio lifetime costs and benefits by offering category.

Table 58. Pa PUC Table 15 – Portfolio Summary of Lifetime Costs and Benefits by Category

Category	Total Discounted Lifetime Costs (\$000) ¹	Total Discounted Lifetime Benefits (\$000)	Present Value of Net Benefits (\$000) ²	Benefit-Cost Ratio (TRC Ratio)
Market Rate EE (<i>exclusive of Low-Income</i>) ³	\$658,049	\$1,070,287	\$412,238	1.63
Low-Income	\$51,582	\$107,568	\$55,986	2.09
Solar PV	\$70,660	\$144,676	\$74,016	2.05
CHP	\$52,842	\$80,768	\$27,926	1.53
Demand Response	\$13,010	\$13,981	\$971	1.07
Total Portfolio⁴	\$846,143	\$1,417,280	\$571,137	1.67

¹ Discounted common costs are included proportionately to direct costs in the sector totals.

² “Net” refers to the arithmetic difference between the previous two columns. It does not refer to net verified savings.

³ The Implementation Order disallowed the inclusion of low-income participation in standard, non-low-income-specific residential programs in the calculation of savings towards the low-income carve-out.

⁴ Total values may not equal the sum of all category values due to rounding.

9. Plan Compliance Information and Other Key Issues

9.1. Plan Compliance Issues

9.1.1. Variety of Energy Efficiency Measures

PPL Electric Utilities evaluated every available measure for inclusion in our EE&C Plan, with a focus on equitable access and maximum customer options for all customer sectors. The result is an EE&C Plan that has a robust, comprehensive measure offering, as detailed in Section 3.1.7, provides new pathways for participation for income-eligible customers, and addresses barriers to energy efficiency measure access for each sector, while ensuring PPL Electric Utilities can ensure compliance with the Commission's Implementation Order.

9.1.2. 66 Pa. C.S. §§ 2806.1(c) & (d) Requirements

The Pa PUC requires PPL Electric Utilities to achieve 828,231 MWh/year, with 65,687 MWh/year of energy savings from the low-income sector, as well as 151 MW of peak demand reduction during Phase V. PPL Electric Utilities designed its Plan to achieve all objectives. As previously described, the Company has designed the Plan to modestly exceed targets to allow for uncertainties, such as changes in market conditions, customer preferences, codes or standards changes, or evaluation results.

9.1.3. Low-Income Requirements

As detailed in Section 3.3, the Company's Resource Constrained Energy Efficiency Program for income-eligible customers takes a new approach to energy assistance programs by aligning measure and channel delivery with the Residential Energy Efficiency Program, keeping the existing participation pathways available while expanding options for income-eligible customers. Income-eligible customers eligible for the Resource Constrained Energy Efficiency Program will be offered a similar customer journey and measure offerings as in the Residential Energy Efficiency Program, though at no cost. These offerings will be supported by robust single-family and multifamily support, a clear focus on comprehensive measures with health and safety funding to ensure a bridge to those measures. For measures that remain exclusive to Residential Energy Efficiency Program customers, income-eligible customers may still participate, though these savings will not be counted towards the low-income requirement. PPL Electric Utilities also plans to require the CSPs delivering both the Residential and Resource Constrained Energy Efficiency Programs to be highly integrated. This will ensure the Company can meet all Commission requirements.

As mentioned elsewhere, PPL Electric Utilities will build on the existing and successful collaboration with LIURP to ensure customers receive the maximum benefits available between both programs and to reduce customer acquisition costs. This includes a seamless customer experience, potentially joint funding of projects and/or split-measure costs, and integrated administration and marketing. PPL Electric Utilities will offer measures common to external programs, such as IRA offerings, including heat pumps and heat pump water heaters, and the Company and selected CSP will work with external

program implementation vendor(s) to ensure minimal impact to customers and appropriate incentive stacking. Referrals to external programs will be made where appropriate.

9.1.4. Experimental Equipment and Devices

The Company will strictly limit funding for pilots not currently described in this EE&C Plan, new technology, or experimental equipment to 2% of available funds, allocated to customer class, which is equal to \$2.5 million for residential and low-income sectors combined, \$2 million for small C&I and \$1.5 million for large C&I, for a total of \$6 million. The Company will manage any additional pilot or new technology expenditures to these values. Planned pilot descriptions, including objectives, key research questions, and metrics, can be found in Section 3.

9.1.5. Customers Receiving Supply from Electric Generation Suppliers

All programs, channels, and measures will be available to all customers regardless of their generation service status. It is important to note that while energy savings opportunities will be equitably accessible, actual costs and/or bill savings for customers with contracted generation that is competitively supplied may be different than default generation service customers, based on their rate.

9.1.6. Non-Residential Midstream Lighting

PPL Electric Utilities and the selected CSP will add screening attestation for participating distributors to ensure that incentivized products are not replacing existing LED lamps or fixtures. This will be supported by additional EM&V survey elements to monitor compliance and overall impact. The Company may initiate program, channel, or measure eligibility changes based on results.

9.2. Other Key Issues

9.2.1. Long-Term Energy Efficiency Savings

PPL Electric Utilities' wide array of offerings and commitment to comprehensive measures will not only help the Company to meet the savings requirements set in the Implementation Order but also provide meaningful market transformation across the Commonwealth. New technical support services for commercial and industrial customers will create a more knowledgeable customer base, while enhanced trade ally networks will empower the workforce of the future. This approach will also encourage customers to implement multiple measures, to continually reengage, and help mitigate resource adequacy issues. The Company continues to support distributors and expand our midstream offerings for both the Residential and Business Energy Efficiency Programs to include additional measures, such as HVAC, to encourage distributors to stock efficient products. This support approach extends to other retail point-of-sale opportunities, including dehumidifiers and other small appliances.

9.2.2. Leveraging External Funding

PPL Electric Utilities provides customers with information about external funding opportunities for EE&C on its energy efficiency website, including links to available application sites if available, while integrating potential funding into marketing outreach where appropriate. Due to the uncertainty around

external funding, it is not utilized when forecasting total Phase V energy reduction performance, but rather will be leveraged to potentially improve cost-effectiveness if available. As previously mentioned, the Company and selected CSPs will work with external program implementation vendor(s) to ensure minimal impact to customers and appropriate incentive stacking. Additional information about coordination, specifically with state programs, can be found in Section 4.4.1.

9.2.3. Consumer Education

Customer education is the bedrock on which our programs will find success and is integral in all aspects of program delivery, evaluation, and process improvement. Detailed information about customer education activities related to specific programs and sectors can be found in Section 3.

9.2.4. Program Results

PPL Electric Utilities will keep the Pa PUC, customers, stakeholders, and other appropriate market actors informed about program availability, incentive levels, and the results of the energy efficiency program components and progress toward Plan goals. PPL Electric Utilities will continue to host a dedicated section on the Company website that provides Act 129 information. The Company will host stakeholder meetings to review the results of the most recent semi-annual or annual report and post those reports on its website. These meetings will reference data from the reports, while also providing qualitative information related to customer satisfaction and experience.

10. Appendices

10.1. A. Approved CSP Contract(s) or CSP Contract Terms and Conditions

PPL Electric Utilities filed its EM&V CSP contract for Pa PUC approval on December 1, 2025. The Company is currently negotiating implementation CSP contracts to implement the Residential, Business, and Resource Constrained (Low-Income) Energy Efficiency Programs. Requests for proposals for Overarching Energy Efficiency Marketing and Database are pending. CSP contracts are confidential and are not included with this Plan filing.

10.2. B. Calculation Methods and Assumptions

PPL Electric Utilities based its savings and cost estimates on experience from Phase I, Phase II, Phase III, Phase IV, the TRM, and input from stakeholders and trade allies. The CSPs generated measure cost data using a variety of sources, including the SWE's Phase V incremental cost database, Phase IV program data, and for data not found in the incremental cost database, the CSPs used secondary sources, including the DOE's Technical Support Documents and other statewide TRMs.

Many variables can impact the cost and effectiveness of a measure or program, and these variables led to numerous TRM changes during Phase I, Phase II, Phase III, and Phase IV that influenced program savings, acquisition cost, and TRC test results. In Phase V, PPL Electric Utilities will use the experience and knowledge gained from prior phases to monitor and adjust measures and programs that help ensure the optimum balance of cost and benefits.

In most instances, the Company based the Phase V savings calculations on the 2026 TRM algorithms, Phase IV program data, SWE's Baseline Studies, and industry practices. For measures that were not in the TRM, PPL Electric Utilities worked with the CSPs or used its experience gained from delivering programs in prior phases to calculate measure- and program-level savings, such as the average savings per custom project.

The CSPs based incentive and rebate levels on the percentage of incremental cost or the first-year unit-energy and unit-demand savings potential from the SWE's Market Potential Studies, Phase IV evaluation results and net savings research, online research, and conversations with installation contractors, as well as prior phase experience. These incentive and rebate amounts ranged, on average, from 25% to 75% of the incremental cost of a measure (for Market Rate programs). Some measures require a higher incentive to motivate customer action, while others can have a lower incentive because market transformation and other factors can affect customer behavior.

Marketing and advertising costs for Phase V consist of two components:

- Sector-level CSPs calculated costs required for individual programs and cross-sector marketing to generate sufficient participation to meet the Act 129 targets, based on their implementation experience and knowledge of PPL Electric Utilities' market.

- PPL Electric Utilities allocated a portion of common costs for overarching marketing and advertising campaigns. This entails developing consistent messaging and branding guidelines, conducting market research to contribute to targeted messaging strategies, and providing direction and oversight to support sector-level CSP marketing efforts.

Finally, administrative costs include all utility costs to develop, implement, and manage the Plan, except payments to customers/trade allies (rebates and incentives). These costs include PPL Electric Utilities labor and materials, CSP labor and material, marketing, QA/QC and EM&V, tracking systems, legal, and the SWE costs. These Phase V costs were based on PPL Electric Utilities wage rates; tracking system cost from prior phases; and EM&V costs from prior phases to reflect efficiencies, lessons learned, and revisions to prior phase systems and processes to increase Phase V operational efficiency.

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Petition of PPL Electric Utilities Corporation for
Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan**

Docket No. M-2025-3057329

PPL Electric Utilities Corporation

Statement No. 1

Direct Testimony of Thomas McAteer

List of Topics Addressed:

**Overview of the Filing
Summary of Phase V EE&C Plan and Programs
Details on CSP Contracts**

Date: December 1, 2025

Direct Testimony of Thomas McAteer

Q. Please state your full name and business address.

A. My name is Thomas McAteer , and my business address is 827 Hausman Road, Allentown, Pennsylvania 18104.

Q. By whom are you employed and in what capacity?

A. I am employed by PPL Electric Utilities Corporation (“PPL Electric” or the “Company”) as Manager of Energy Efficiency.

Q. What are your duties as Manager of Energy Efficiency?

A. As Manager of Energy Efficiency for PPL Electric, I am responsible for driving the success of residential, commercial & industrial, and income-eligible energy efficiency programs. I lead the program implementation and evaluation, measurement, and verification teams, I am the primary conservation services provider contract manager and manage all aspects for Plan development, including research and design and data analysis.

Q. What is your educational background?

A. I have a Doctor of Business Administration from Wilmington University, a Masters of Education from Grand Canyon University, and a Bachelor of Liberal Studies from West Chester University of Pennsylvania. I am also a Pennsylvania certified energy auditor and have held Building Performance Institute certifications in Quality Control Inspection, Multifamily Building Analyst, Building Analyst, and Envelope Professional, and I am EPA Lead Safe certified.

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Q. Please describe your professional experience.

A. I have 17 years of experience in energy efficiency, including as a Weatherization Assistance Program auditor, a field team supervisor, a portfolio program manager for a conservation services provider (“CSP”) and as the principal energy efficiency administrator for PPL Electric for the last three years. I have designed and implemented a variety of pilots, performed energy assessments on thousands of homes and commercial buildings, and designed and implemented successful Act 129 programs and portfolios.

Q. Have you previously testified as a witness before the Pennsylvania Public Utility Commission (“Commission”)?

A. Yes. I testified on behalf of PPL Electric during Phase IV of its EE&C Plan at Docket No. M-2020-3020824, when the Company sought approval of certain changes to its Phase IV Plan,¹ as well as in a formal complaint proceeding, *Jesse Williams Epps v. PPL Electric Utilities Corporation*, at Docket No. C-2023-3041068. Before coming to PPL Electric, I also testified as a witness in support of another Pennsylvania electric distribution company (“EDC”) regarding a complaint filed against that EDC’s Low-Income Usage Reduction Program in my capacity as a program manager for the EDC’s CSP.

¹ See *Petition of PPL Electric Utilities Corporation for Approval of Changes to Its Act 129 Phase IV Energy Efficiency and Conservation Plan*, Docket No. M-2020-3020824 (Orders entered Apr. 27 and Aug.24, 2023).

Q. Briefly describe the subject matter of your testimony in this proceeding.

A. I will explain the objectives, philosophy, and process that PPL Electric applied to the preparation of its Phase V EE&C Plan filing as required by Act 129 of 2008 (“Act 129”), as well as the relevant Commission Orders for Phase V. See *Energy Efficiency and Conservation Program*, Docket No. M-2025-3052826 (Order entered June 18, 2025) (“Phase V Implementation Order”); *2026 Total Resource Cost (TRC) Test*, Docket No. M-2024-3048998 (Order entered Nov. 7, 2024) (“2026 TRC Test Order”) (collectively, “Phase V Orders”).

Q. Please describe how PPL Electric’s EE&C Plan filing is organized.

A. PPL Electric’s filing consists of the following documents:

1. A petition requesting approval of the EE&C Plan and the Company’s proposed cost recovery mechanism.
2. The EE&C Plan (PPL Electric Exhibit 1);
3. The direct testimony of Thomas McAteer (PPL Electric Statement No. 1);
4. The direct testimony of Terry Fry (PPL Electric Statement No. 2); and
5. The direct testimony of Katelyn Arnold (PPL Electric Statement No. 3), including PPL Electric Exhibit KA-1 (the *pro forma* tariff supplement for the Company’s Act 129 Compliance Rider).

The Phase V EE&C Plan is structured consistent with the Template for Energy Efficiency and Conservation Plans issued by the Commission via Secretarial letter dated September 8, 2025, at Docket No. M-2025-3052826. The EE&C Plan includes an overview of the Plan; program summary tables and charts; program descriptions; program management and

implementation strategies; information about the reporting and tracking systems; the Company's plans for quality assurance, evaluation, measurement, and verification; details of the proposed cost recovery mechanism; an analysis of the EE&C Plan's and programs' cost-effectiveness; and other information to support the EE&C Plan.

Q. Are you sponsoring any exhibits in this proceeding?

A. Yes. Katelyn Arnold, Terry Fry, and I are co-sponsoring PPL Electric Exhibit 1. Within that exhibit, I am primarily responsible for and am sponsoring Sections 1 through 6 and Sections 9 and 10. Katelyn Arnold is primarily responsible for and is sponsoring Section 7. Terry Fry is primarily responsible for and is sponsoring the calculations in Section 3 and Section 8.

Q. Please provide a summary of PPL Electric's Phase V EE&C Plan.

A. PPL Electric's Phase V EE&C Plan includes a portfolio of EE&C programs for PPL Electric's customers that are designed to meet the Company's Phase V consumption reduction and peak demand reduction targets and to comply with the other requirements set forth in the Commission's *Phase V Orders*. As discussed below, the Phase V EE&C Plan includes a range of EE&C programs for four customer sectors (*i.e.*, Residential, Low-Income, Small Commercial and Industrial ("Small C&I"), and Large Commercial and Industrial ("Large C&I")). These programs are designed as a portfolio of options, which will offer PPL Electric's customers cost-effective and flexible choices and financial incentives to reduce their electric consumption and peak demand, which ultimately will help customers reduce their energy costs.

Q. What are the primary objectives of the Phase V EE&C Plan?

A. PPL Electric aims to deliver a cost-effective portfolio of programs that will meet customers' needs, fulfill the Company's Phase V EE&C Plan objectives, and achieve the results required by Act 129 and the Commission's *Phase V Implementation Order*, including the following:

- Achieve 828,231 MWh gross verified energy savings by May 31, 2026;
- Achieve 65,678 MWh gross verified energy savings from low-income customers by May 31, 2026;
- Achieve 151 MW of peak demand savings (measured at the generator level) by May 31, 2026;
 - Acquire at least 75% of the proposed peak demand reduction in each season (*i.e.*, in both the summer and winter seasons);
- Achieve at least 15% of the energy consumption and peak demand reduction targets in each program year;
- Demonstrate that the proportion of measures available to the low-income sector is at least 9.95% of the total measures available to all customer sectors;
- Have a portfolio of EE&C programs that is cost-effective as determined by the Total Resource Cost ("TRC") Test; and
- Spend no more than \$307.5 million plus the costs for the Commission's Statewide Evaluator ("SWE"), which PPL Electric estimates are approximately \$5 million. I note that at the time PPL Electric prepared its EE&C Plan, the Commission had not awarded the Phase V SWE contract.

Q. Please describe PPL Electric’s overall strategy to achieve these objectives.

A. Section 1.1.2 of the EE&C Plan describes the Company’s strategy to achieve compliance targets. Specifically, PPL Electric will supplement its already successful approach to program delivery and build on prior phase infrastructure, best practices, and high customer satisfaction. The Company will maintain effective strategic administration while partnering with highly qualified CSPs to implement the programs. Key new strategies to meet the Commission’s compliance targets include removing barriers to participation, promoting program equity, providing new services, allowing flexibility and innovation, and enhancing our supply chain engagement.

Q. Please describe the process PPL Electric used to develop its Phase V EE&C Plan.

A. PPL Electric formed a project team consisting of the internal Energy Efficiency and Conservation Group (consisting of the program and evaluation, measurement, and verification teams), the Company’s third-party evaluator Cadmus Group LLC (“Cadmus”), and external consultant E-Source. The Company conducted a thorough review of: (1) the Phase V Market Potential Study; (2) the Commission’s *Phase V Orders*; (3) the 2026 Pennsylvania Technical Reference Manual (“TRM”); and (4) the results of PPL Electric’s Phase IV EE&C programs. PPL Electric established guiding principles, key objectives, and preliminary estimates of the savings and cost budgets for each customer sector (*i.e.*, Residential, Low-Income, Small C&I, and Large C&I) that would satisfy the overall savings and peak demand targets, develop a daily load shifting program, meet the Low-Income set-aside target, and provide a reasonable distribution of savings and costs across

1 the customer sectors. In addition, the Company maintains an ongoing research and
2 development cycle that allows program examples and best practices to be analyzed for the
3 potential benefit of our customers. This research also includes surveys of customers from
4 all sectors, trade allies, and other market actors. All available information was synthesized
5 into a Plan that is realistic, achievable, and meets all compliance requirements.

6 PPL Electric issued requests for proposals (“RFPs”) for its three program
7 implementation CSP contracts (*i.e.*, Residential, Resource Constrained (Low-Income), and
8 Business (Non-Residential)). Through the RFP process, CSPs were invited to submit
9 proposals to meet verified gross energy savings and coincident peak demand targets within
10 the available budget for direct program costs, while ensuring total portfolio cost-
11 effectiveness. The CSP submissions were compared to the Company’s baseline portfolio
12 model for alignment, and their portfolio approach was analyzed to ensure it met PPL
13 Electric Utilities’ stated core and new strategies and guiding principles. Other
14 requirements included a customer satisfaction target where at least 85% of customers rate
15 themselves as satisfied or very satisfied and capture at least 15% of the total cumulative
16 savings each program year. All CSP assumptions, estimates, and forecasts were required
17 to have supporting documentation or references to ensure feasibility. In addition, PPL
18 Electric solicited bids for a CSP to conduct an independent evaluation of its EE&C Plan.

19 PPL Electric developed the portfolio as a multiyear, comprehensive, and
20 collaborative undertaking. The Company utilized a data science approach, leveraging
21 existing program data elements, to determine preliminary sector budgets. The budgets,
22 cost estimates, and participation data were used to create an initial portfolio model that

1 was compared to the information available within the SWE's Phase V studies and
2 supporting documentation.

3
4 **Q. Please describe the programs included in PPL Electric's Phase V EE&C Plan.**

5 A. The programs in the Phase V EE&C Plan include the following:

- 6 • The Residential Energy Efficiency Program, which consists of the following
7 components:
 - 8 ○ Energy Efficient Home. This program component provides incentives for energy
9 efficient equipment in a home, such as heating, cooling, water heating, smart
10 thermostats, appliances, insulation, and air sealing. This component is designed to
11 target residential homebuilders, all residential sector customers, and commercial
12 and industrial customers that may benefit from residential end-use measures, and is
13 available for all customer sectors. This component offers measures that are similar
14 to those delivered in Phase IV.
 - 15 ○ Appliance Recycling. This program component provides incentives for customers
16 to remove and recycle refrigerators, freezers, windows, room air conditioners, and
17 dehumidifiers. This component is designed to target all residential customers and
18 commercial and industrial customers that may benefit from residential end-use
19 appliance recycling measures and is available for all customer sectors. This
20 component is similar to the Phase IV program.
 - 21 ○ Student Energy Efficient Education. This program component provides energy
22 efficiency education and kits to students in grades K-12. This component is a
23 continuation of the Phase IV program.

1 ○ Persistent Demand Response. This new program component is designed to reduce
2 electric system demand during defined peak periods through the deployment of
3 thermostat optimization, managed electric vehicle (“EV”) charging, and battery
4 storage. This offering supports grid reliability, defers capacity investments, and
5 enhances the integration of variable renewable energy resources. This component
6 targets residential customers who have already opted into utility demand response
7 programs through an existing thermostat original equipment manufacturer
8 (thermostat optimization), with EVs and existing or newly purchased at-home
9 charging equipment that can be effectively networked into the component
10 (managed EV charging), or with an existing battery storage system (battery
11 storage). PPL Electric estimates that approximately 1.2 million residential
12 customers will be eligible for demand response incentives. This component is a
13 new offering in the Phase V Plan.

- 14 • The Resource Constrained Energy Efficiency Program (formerly known as the Low-
15 Income Program) takes a new approach to energy assistance programs by aligning
16 measure and channel delivery with the Residential Energy Efficiency Program, keeping
17 the majority of the existing participation pathways while expanding options for income-
18 eligible customers. The Resource Constrained Energy Efficiency Program includes
19 measures for customers at or below 150% of the federal poverty level. Only measures
20 outlined within this program will be attributed to the low-income carveout. This
21 program also includes several measures targeted toward owners of multifamily
22 buildings, who fall within the Small C&I customer sector. Specifically, the Resource
23 Constrained Program will consist of the following three components:

- Energy Efficient Homes. This program component includes a Single Family Energy Assessment channel similar to the Phase IV Low-Income Assessment component, which provides income-eligible customers with in-home or virtual assessments, with a focus on home performance analysis that may lead to comprehensive measures, including appliance replacement and a wide variety of other direct install measures, for all eligible customers. The program component also includes building shell and HVAC measures available for electric heat customers and increased Health and Safety funding built upon the successful Phase IV Health and Safety Pilot. The Company will also offer multifamily energy assessments, ensuring that all occupants of multifamily buildings will have access to the same measures as Single-Family Energy Assessment customers, including comprehensive measures, when applicable. The Energy Efficient Homes component is designed to target residential sector customers at or below 150% of the federal poverty level and C&I multifamily housing customers serving income-eligible tenants that may benefit from program measures.
- Appliance Recycling. This program component mirrors the Residential Energy Efficiency Program and includes the scheduling, free pick-up, and environmentally responsible recycling of a variety of appliances, including, though not limited to, refrigerators and compact refrigerators, freezers, dehumidifiers, room air conditioners, and other appliances deemed acceptable by the Company. This component is designed to target all income-eligible residential customers and C&I customers that own multifamily buildings that serve income-eligible tenants who may benefit from residential end-use appliance recycling measures.

○ Student Energy Efficiency Education. This program component mirrors the Residential Study Energy Efficiency program and provides energy efficiency education and kits to income-eligible students in grades K-12. The Student Energy Efficiency Education component is designed to target residential sector customers at or below 150% of the federal poverty guidelines.

• The Non-Residential Program, which consists of the following component:

○ Small and Large C&I Business Solutions. This program component provides incentives for energy efficient equipment, as well as educational and technical assistance for all business types in the Company's service territory. Measures may include HVAC, refrigeration, solar, controls, lighting, appliances, motors and drives, CHP, compressed air, and more. This program is available to all non-residential customers, regardless of industry and sector, as well as residential customers (*e.g.*, those who own farms) that may benefit from business energy efficiency rebates. PPL Electric is also offering Business Support Services as a new offering in Phase V, which is dedicated to increasing participation across all industry sectors by offering administrative, technical, engineering, and design support to businesses developing energy efficiency projects.

Q. Is the Company proposing any pilot programs as part of its Phase V EE&C Plan?

A. Yes. As part of the Residential Energy Efficiency Program, the Company is proposing a Conservation Voltage Reduction ("CVR") Pilot and a Peak Time Rebates Pilot, as described on page 68 of the Plan. As described on page 103 of the Plan, the Company is proposing a Window Saddle Heat Pump Pilot program for Resource Constrained customers

that reside in multifamily housing. As part of the Business Energy Efficiency Program, the Company is proposing a Peak Load Shift Pilot, as described on page 176 of the Plan.

Q. Is the Phase V EE&C Plan designed to meet the consumption reduction targets and the peak demand reduction target within the designated expenditure cap?

A. Yes. The EE&C Plan is designed to meet the overall consumption reduction target, the Low-Income set-aside consumption reduction target, and the peak demand reduction target, all within the expenditure cap. In fact, PPL Electric has designed its EE&C Plan to exceed all of the compliance targets, within the expenditure cap, to account for risks and uncertainties, such as evaluation results that differ from expectations.

As shown in Table 2 of the EE&C Plan, the estimated overall consumption reduction is 1,066,059 MWh, which exceeds the 828,321 MWh overall compliance target by approximately 29%. The estimated consumption reduction from low-income customers is 75,623 MWh, which exceeds the 65,678 MWh Low-Income compliance target by approximately 15%. The estimated overall peak demand reduction of 180.6 MW exceeds the 151 MW peak demand reduction compliance target by approximately 20%.

Q. Please describe the Company's strategy to ensure the EE&C Plan is designed to achieve at least 15% of the total consumption reduction target in each program year.

A. As shown on Table 5 of the EE&C Plan, PPL Electric has designed its EE&C Plan to achieve 25% of the total consumption reduction target in Program Year 18, 29% in Program Year 19, 29% in Program Year 20, 26% in Program Year 21, and 20% in Program Year 22. PPL Electric Utilities will monitor program and channel performance and, if

necessary, adjust marketing and communications, incentive levels, eligibility requirements, sector and program budgets, and/or measure offerings to manage participation as necessary to achieve at least 15% of its portfolio target annually.

Q. Please describe the Company's strategy to ensure the EE&C Plan is designed to achieve at least 75% of the peak demand reduction target in each season.

A. As shown on Table 6 of the EE&C Plan, PPL Electric has designed its EE&C Plan to achieve 140% of the peak demand reduction target in the summer season and 99% of the peak demand reduction target in the winter season. PPL Electric Utilities has worked closely with its selected CSPs to develop a selection of measures that offer benefits in both seasons. In addition, the Company's demand response activities will be available across seasons, further supporting the Company's plan to acquire 75% of the proposed peak demand target in each season.

Q. Does the EE&C Plan include at least one comprehensive program for residential customers and at least one comprehensive program for non-residential customers?

A. Yes. As described in Section 3.1 of the EE&C Plan, the EE&C Plan includes comprehensive measures in its Residential, Resource Constrained (Low-Income), and Business (Non-Residential) Programs. Specifically, both the Residential and Resource Constrained Programs will provide a comprehensive mix of cost-effective energy efficiency measures for all building types (single-family, multifamily, and manufactured homes and existing and new construction). Both programs will offer in-home energy audits that assess end uses, including weatherization, water heating, lighting, HVAC, and

1 appliances. All residential customers will receive energy efficiency and peak demand
2 education and be encouraged to implement multiple measures to take a comprehensive
3 approach to energy efficiency. Moreover, the Company's restructuring of its Resource
4 Constrained (Low-Income) offerings will create a more equitable experience for all
5 customers by providing income-eligible customers with access to measures available to
6 standard residential customers, as well as a similar customer journey. This includes a
7 selection of no-cost products through the Company's online marketplace, appliance
8 recycling, student energy efficiency education, and an expanded local contractor network.
9 The inclusion of additional health and safety funding will facilitate more comprehensive
10 projects for income-eligible customers. The Company will not cap participation for any
11 multifamily customers, including those residing in master metered low-income multifamily
12 buildings. In addition, the Residential and Resource Constrained Energy Efficiency
13 Programs will be closely coordinated by the selected CSPs to create a portfolio structure
14 that will allow for more efficient and flexible operations and marketing during
15 implementation.

16 For non-residential customers, PPL Electric's Business Program will target
17 business customers of all sizes and in every segment, as well as government and
18 educational institutions, with a comprehensive range of prescriptive measures (including
19 HVAC, lighting, and water heating) as well as opportunities to implement custom
20 efficiency projects for measures not included in the TRM. Custom component measures
21 cover a comprehensive set of non-residential needs, including CHP, advanced controls,
22 compressed air, and other projects that result in cost-effective energy efficiency savings.

1 In addition, customers of any sector can take advantage of any eligible measures in
2 the EE&C Plan across programs, with costs to be recovered by the appropriate customer
3 sector. This will allow measures to be applied as needed by the end-use customer, as
4 various residential measures can be useful to business customers and vice versa. This will
5 be an improved and more seamless customer experience in Phase V. For example,
6 residential customers who own farms can utilize agricultural business measures, and
7 business customers that own multifamily buildings can take advantage of popular
8 residential measures, such as appliance recycling. This approach promotes more
9 comprehensive measure use and provides a more balanced portfolio across customer
10 classes.

11
12 **Q. Is the Company proposing to sell peak demand into PJM Interconnection LLC's**
13 **("PJM") Forward Capacity Market in Phase V?**

14 A. No. As noted in the *Phase V Implementation Order*, peak demand reductions from energy
15 efficiency programs are no longer eligible to participate in the PJM Forward Capacity
16 Market, so peak demand reduction sales are not included in the Company's Phase V EE&C
17 Plan.

18
19 **Q. What process is the Company proposing to evaluate and update its EE&C Plan?**

20 A. PPL Electric's staff plans to carefully monitor actual program performance compared to
21 estimates in the EE&C Plan. In addition, PPL Electric's independent evaluator will
22 conduct an impact evaluation, an annual cost-effectiveness evaluation, and process
23 evaluations of each program and the overall portfolio. If actual performance deviates from

the estimates in the EE&C Plan, PPL Electric will work with its program implementation CSPs to adjust the performance of programs or will recommend changes to the EE&C Plan. This includes modifying marketing tactics, adjusting incentive levels within specified ranges, offering different measures at different times, and offering multiple delivery channels. To the extent that there are any changes that require Commission approval, PPL Electric will seek approval of such changes in accordance with the EE&C Plan change procedures outlined in the Commission's *Minor Plan Change Order* entered on June 10, 2011, at Docket No. M-2008-2069887, and the *Phase V Implementation Order*.

Q. Does the Phase V EE&C Plan offer at least one energy-efficiency program for each customer sector?

A. Yes. As shown in Tables 1 and 9 of the EE&C Plan (among numerous other tables and sections), there is at least one program available for each of the four customer sectors -- Residential, Low-Income, Small C&I, and Large C&I.

Q. Has PPL Electric competitively bid its relevant contracts for the Phase V EE&C Plan?

A. Yes. As mentioned previously, PPL Electric has issued competitive RFPs for all of its CSPs and one CSP for Evaluation, Measurement, and Verification ("EM&V"). The Company is finalizing its implementation CSP contracts for submittal to the Commission for approval. The contracts for database and overarching marketing are currently in the RFP process.

- 1 **Q.** **Does this conclude your direct testimony?**
- 2 **A.** Yes, it does. However, I reserve the right to supplement my testimony.

VERIFICATION

I, THOMAS J. McATEER, being the Manager-Energy Efficiency at PPL Electric Utilities Corporation, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief and that I expect PPL Electric Utilities Corporation to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 relating to unsworn falsification to authorities.

Date: December 1, 2025

A handwritten signature in black ink, appearing to read 'T. McAteer', is written above a horizontal line.

Thomas J. McAteer

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Petition of PPL Electric Utilities Corporation for
Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan**

Docket No. M-2025-3057329

PPL Electric Utilities Corporation

Statement No. 2

Direct Testimony of Terry Fry

**List of Topics Addressed:
Development of the Phase V EE&C Plan
Total Resource Cost (TRC) Test Calculations**

Date: December 1, 2025

Direct Testimony of Terry Fry

Q. Please state your full name and business address.

A. My name is Terry Fry, and my business address is 800 N. Glebe Road, Suite 500, Arlington, VA 22203.

Q. On whose behalf are you presenting testimony in this proceeding?

A. I am testifying on behalf of PPL Electric Utilities Corporation (“PPL Electric” or the “Company”).

Q. By whom are you employed and in what capacity?

A. I am employed by The Cadmus Group LLC (“Cadmus”) as Executive Vice President, Global Energy Strategy.

Q. What are your duties as Executive Vice President, Global Energy Strategy?

A. I am responsible for managing advising the firm’s global divisions on energy transition strategies, as well as consulting practices and providing technical leadership in utility planning, grid-edge technology deployment, and assessment, evaluation, measurement, and verification practice areas of the firm.

Q. What is your educational background?

A. I hold an MPhil degree in Economics and Politics of Development from Cambridge University and a BS in Mechanical Engineering from Stanford University.

1 **Q. Please describe your professional experience.**

2 A. Since 1987, I have worked in the energy utility industry in various capacities, including as
3 a researcher, consultant, educator, and policy advisor. With the assistance of my staff, I
4 have provided technical advice and consultation to energy utilities on matters related to
5 resource planning, load research, grid modernization, market assessment, energy
6 efficiency, demand response, portfolio assessment, and performance measurement and
7 verification. Before joining Cadmus in 2017, I was Senior Vice President for Utility
8 Services at Nexant from 2000 to 2017. I served as senior Project Director at Bechtel
9 Technology and Consulting (the parent of Nexant’s spin-out) from 1997-2000. Prior to
10 that, I served as a principal in the consulting firm of Barakat & Chamberlin, where I led
11 the firm’s utility planning and strategy practice. I have also served as an appointed Advisor
12 on renewable energy and energy efficiency to the US Department of Commerce Secretary
13 since 2008, completing a sixth term in 2023.

14
15 **Q. Have you previously testified as a witness before the Pennsylvania Public Utility**
16 **Commission (“Commission”)?**

17 A. Yes, I provided testimony on behalf of PPL Electric for its Phase IV EE&C Plan.
18

19 **Q. What is the purpose of your testimony?**

20 A. The purpose of my testimony is to provide supplemental information regarding PPL
21 Electric’s proposed Phase V Act 129 Energy Efficiency and Conservation Plan (“Phase V
22 EE&C Plan” or “EE&C Plan”), which is being submitted in accordance with Act 129 of
23 2008, P.L. 1592, 66 Pa. C.S. §§ 2806.1, 2806.2 (“Act 129”), the Commission’s June 18,

2025 Implementation Order at Docket No. M-2025-3052826 (“*Phase V Implementation Order*”), and the Commission’s 2026 Total Resource Cost (“TRC”) Test Order entered on November 7, 2024, at M-2024-3048998 (“*2026 TRC Test Order*”).

Q. What was your role in preparation of PPL Electric’s proposed EE&C Plan?

A. I and my staff, working under my supervision, provided PPL Electric with technical information regarding the design of some of the programs in the proposed Phase V EE&C Plan and assisted PPL Electric in preparing the portfolio, including the tables in the EE&C Plan. I also oversaw the technical analyses and quantitative program and portfolio summaries prepared in accordance with the Commission’s EE&C Plan Template issued on September 8, 2025, at Docket No. M-2025-3052826, as well as the benefit-cost analyses performed in accordance with the Commission’s *2026 TRC Test Order*.

Q. Are you sponsoring any exhibits in the filing?

A. Yes. As Thomas McAteer explains in PPL Electric Statement No. 1, Thomas McAteer, Katelyn Arnold, and I are co-sponsoring PPL Electric’s Phase V EE&C Plan, which has been identified as PPL Electric Exhibit 1. Specifically, I am responsible for and am sponsoring Section 2, as well as calculations in Section 3 and Section 8 of that exhibit.

Q. Please describe your responsibilities for each of these sections of the EE&C Plan.

A. I, with support from my staff, made the following contributions to the various sections of the EE&C Plan:

- **Section 2** - A quantitative overview of the entire Phase IV EE&C Plan for the five-year period, in accordance with the Commission's EE&C Plan Template. The overview consists of the following tables:
 - **Table 8** – Summary of Portfolio Costs;
 - **Table 9** – Program Summaries;
 - **Table 10** – Budget and Parity Analysis Summary;
- **Section 3** - Review of program-specific costs, savings, and cost-effectiveness calculations; and
- **Section 8** - Determination of avoided costs and cost-effectiveness analysis for each program and the portfolio according to the Commission's *2026 TRC Test Order*.

Q. Does the Phase V EE&C Plan contain a process for conducting an annual cost-effectiveness evaluation of the EE&C Plan in accordance with the Commission's 2026 TRC Test Order?

A. Yes. The Phase V EE&C Plan outlines a process for conducting an annual cost-effectiveness evaluation of the EE&C Plan in accordance with the Commission's *2026 TRC Test Order*. See Section 1.8.3 of the Phase V EE&C Plan.

Q. What method was used to estimate the cost-effectiveness of the Phase V EE&C Plan and its individual programs?

A. For each program in the Phase V EE&C Plan and for the entire EE&C Plan (including portfolio-level common costs), cost-effectiveness was estimated in accordance with the

procedures described in the Commission's 2026 TRC Test Order and industry documents such as the *California Standard Practice Manual*.¹

Q. Is the proposed Phase V EE&C Plan cost-effective, as a whole, based on the TRC criteria?

A. Yes. The cost-effectiveness of the proposed portfolio is demonstrated using data presented in the Phase V EE&C Plan, specifically in Section 3 and in Tables 56 and 57 in Section 8. For each program in the Phase V EE&C Plan, PPL Electric determined cost-effectiveness in accordance with the Commission's 2026 TRC Test Order.

PPL Electric's proposed Phase V EE&C Plan is cost-effective as a whole. See Section 8 of the Phase V EE&C Plan. Specifically, the TRC benefit-to-cost ratio for the overall Phase V EE&C Plan, inclusive of energy efficiency and demand response, is 1.67. This well exceeds the value of 1.0 required by Act 129 and is consistent with the benefit-cost ratio of well-performing programs in other states, especially considering Pennsylvania's set-aside savings requirement for the Low-Income customer sector.

Tables 3 and 4 in the Phase V EE&C Plan provide summaries of first-year and lifetime costs and benefits used to compute each program's cost-effectiveness from a TRC perspective. I note that PPL Electric determined the unit savings, unit counts, and effective useful life ("EUL") for each measure. To determine lifetime savings, the Company validated unit savings and EULs for each measure by assessing conformity with the Commission's 2026 TRM Update Final Order entered on September 12, 2024, at Docket

¹ The *California Standard Practice Manual for Economic Analysis of Demand-Side Management Programs and Projects*, California Energy Commission, July 2002. See http://www.calmac.org/events/SPM_9_20_02.pdf.

1 M-2023-3044491, and Phase IV program data. The Company then determined incremental
2 costs and avoided cost benefits for each measure.

3
4 **Q. How did the Company assess the cost-effectiveness for each program?**

5 A. Assessment of cost-effectiveness for each program in the Phase V EE&C Plan began with
6 determining each program's total resource benefits ("TRC Benefits") based on the savings
7 of the individual measures over their lives, for a maximum of 15 years as directed in the
8 *2026 TRC Test Order*,² as well as the program's total resource costs ("TRC Costs"). A
9 program was deemed cost-effective if its TRC Benefits exceeded its TRC Costs or the
10 benefit-to-cost ratio exceeded 1.0.

11 The TRC data used in this assessment were estimates based on the planning
12 assumptions in this Phase V EE&C Plan. The Company will utilize the 2026 TRC test to
13 monitor programs and portfolio cost-effectiveness annually and ensure TRC results are
14 above 1.0 at the portfolio level.

15
16 **Q. Please describe the calculation of avoided costs of supplying electricity.**

17 A. PPL Electric Utilities used the 2026 Avoided Cost Calculator provided by the SWE to
18 calculate avoided costs and review the cost effectiveness of its Phase V EE&C plan. The
19 Company calculated the avoided costs of delivered electricity for a 15-year planning
20 horizon in three segments, as follows:

² 2026 TRC Test Order at 16-17.

- 1 • ***Years 1-4 (June 2027-May 2031).*** The Company used the NYMEX Electricity Futures
2 Price at the PJM West Hub as of July 7, 2025, and applied a locational basis adjustment
3 from PJM West Hub to the Company's Zone.
 - 4 • ***Years 5-10 (June 2031-May 2037).*** PPL Electric used NYMEX Henry Hub Natural
5 Gas Futures and the EIA AEO Natural Gas Price Forecast for Mid-Atlantic Region as
6 of July 7, 2025 and converted to electric prices using an on-peak and off-peak heat rate
7 and spark spread.
 - 8 • ***Years 11-15 (June 2037-May 2046).*** PPL Electric used Middle Atlantic Natural Gas
9 Prices for Electric Power from the Energy Information Administration Annual Energy
10 Outlook, Energy Prices by Sector and Source, converted to electric prices using the on-
11 peak and off-peak heat rate and including on-peak and off-peak spark price spreads.
- 12 The Company estimated avoided generation capacity costs using PJM base residual auction
13 results for 2026/2027. Subsequent years are inflated by the rate of inflation specified in
14 the Phase V TRC Test Order. Avoided transmission and distribution ("T&D") costs are
15 from the SWE Avoided Cost of Transmission and Distribution Capacity Study. Avoided
16 transmission costs are escalated at the rate of inflation, but avoided distribution costs
17 change by varying rates based on the outcomes of the probabilistic deferral analysis
18 methodology. Avoided T&D costs are provided by EDC and year in the 2026 Avoided
19 Cost Calculator.

1 **Q. What are the sources for the Company’s estimates of savings, incremental cost, and**
2 **measure life?**

3 A. PPL Electric based its savings and cost estimates on experience from Phase I, Phase II,
4 Phase III, Phase IV, the TRM, and input from stakeholders and trade allies. The CSPs
5 generated measure cost data using a variety of sources, including the SWE’s Phase V
6 incremental cost database, Phase IV program data, and for data not found in the incremental
7 cost database, the CSPs used secondary sources, including the DOE’s Technical Support
8 Documents, ENERGY STAR documentation, and other statewide TRMs and incremental
9 cost studies.

10
11 **Q. What benefits were used in the TRC calculation?**

12 A. The benefits used in the TRC calculation include the full value of time and seasonally
13 differentiated avoided generation, transmission and distribution, and capacity costs. These
14 benefits also accounted for avoided line losses. To capture the full value of time and
15 seasonal impacts of each program measure, the annual generation capacity value was
16 assigned to each program measure according to the hourly load shape of the end user
17 affected by the measure. The Company factored fossil fuel savings and non-energy
18 benefits, such as water and operations and maintenance (“O&M”) savings, into the
19 calculation of benefits.

20
21 **Q. What was included in the cost component of the TRC analysis?**

22 A. The cost component of the TRC analysis included: (1) incremental measure costs; and (2)
23 electric distribution company (“EDC”) costs.

Incremental measure costs are the expenses associated with the installation of energy efficiency measures and ongoing O&M costs, where applicable. The incremental measure costs were obtained primarily from the SWE's Phase V incremental cost database. Measure costs not included in this study were obtained from a variety of sources, including PPL Electric's actual experience, the results of the Company's Phase IV evaluations (such as the actual project cost for an average custom commercial and industrial project), the Department of Energy Technical Support Documents, ENERGY STAR documentation, and other statewide TRMs and incremental cost studies.

EDC costs are costs that are in the EE&C Plan budget subject to the funding cap plus SWE costs that are not subject to the funding cap. EDC costs consist of expenses associated with program development, delivery, and ongoing operation, specifically: (1) EDC labor, material, and supplies; (2) customer incentives³; (3) CSP labor, materials, and supplies; and (4) marketing.

PPL Electric's EDC costs fall into two general categories:

- **Direct Program Costs:** The costs that are directly related to and charged to a specific program; and
- **Common Costs (or "Portfolio-level Costs"):** The costs that are applicable to more than one customer class or more than one program, or that provide portfolio-wide benefits.]

³ Customer incentives are not included in calculation of TRC costs, in accordance with procedures described in the Commission's 2026 TRC Test Order.

1 **Q.** **Does this conclude your direct testimony?**

2 **A.** Yes, it does. However, I reserve the right to supplement my testimony.

VERIFICATION

I, TERRY FRY, being the Executive Vice President, Global Energy Strategy at The Cadmus Group, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief and that I expect PPL Electric Utilities Corporation to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 relating to unsworn falsification to authorities.

Date: December 1, 2025

Terry Fry

Terry Fry (Dec 1, 2025 08:41:27 PST)

Terry Fry

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Petition of PPL Electric Utilities Corporation for
Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan**

Docket No. M-2025-3057329

PPL Electric Utilities Corporation

Statement No. 3

Direct Testimony of Katelyn Arnold

**List of Topics Addressed:
Spending Cap for the Phase V EE&C Plan
Phase V EE&C Cost Recovery Mechanism**

Date: December 1, 2025

Direct Testimony of Katelyn Arnold

Q. Please state your full name and business address.

A. My name is Katelyn Arnold, and my business address is 827 Hausman Road, Allentown, PA 18104-9392.

Q. By whom are you employed and in what capacity?

A. I am employed by PPL Services Corporation (“PPL Services”), a subsidiary of PPL Corporation and an affiliate of PPL Electric Utilities Corporation (“PPL Electric” or the “Company”) as Manager – Regulatory Strategy & Rates.

Q. What are your duties as Manager – Regulatory Strategy & Rates?

A. I am responsible for the development and execution of rate filings, including the Act 129 Compliance Rider (“ACR”), rate-related revenue analysis and reporting, including auditing controls and requirements, rate compliance, rate case success for the regulated electric business, and ad-hoc analysis to optimize business planning.

Q. What is your educational background and experience?

A. I graduated from Lafayette College in 2017 with a Bachelor of Arts in Government & Law and Economics. I graduated from Lehigh University in 2022 with a Master of Business Administration degree.

1 **Q. Please describe your professional experience.**

2 A. In 2018, I was employed by PPL Services as a Financial Analyst in the Treasury
3 Department where I supported the Accounts Payable function. In 2020, I moved into a
4 Regulatory Policy Specialist role in PPL Services. In 2022, I was promoted to Sr.
5 Regulatory Policy Specialist. In 2023, I assumed the role of Manager – Regulatory
6 Strategy & Compliance, and in July 2024 my role was expanded to Manager – Regulatory
7 Strategy & Rates, which is my current role.

8

9 **Q. Have you previously testified as a witness before the Commission?**

10 A. Yes. I have testified before this Commission in PPL Electric’s base rate case proceeding
11 at Docket No. R-2025-3057164.

12

13 **Q. Briefly describe the subject matter of your testimony in this proceeding.**

14 A. I will describe the calculation of PPL Electric’s spending cap for the programs in its Phase
15 V Energy Efficiency and Conservation Plan (“Phase V EE&C Plan” or “EE&C Plan”). I
16 also will explain the Company’s proposed mechanism for recovering the costs of its Phase
17 V EE&C Plan.

18

19 **Q. Are you sponsoring any exhibits in this proceeding?**

20 A. Yes. I am primarily responsible for and sponsoring Section 7 of PPL Electric Exhibit 1,
21 the Company’s Phase V EE&C Plan. I also am sponsoring PPL Electric Exhibit KA-1,
22 which is a copy of the proposed *pro forma* tariff supplement for the Company’s Act 129
23 Compliance Rider – Phase 5 (“ACR-5”), which is PPL Electric’s proposed non-bypassable

1 surcharge that will recover the costs associated with the Phase V EE&C Plan consistent
2 with Sections 1307 and 2806.1(k)(1) of the Public Utility Code.

3
4 **Q. What is the spending cap for PPL Electric’s Phase V EE&C Plan?**

5 A. The spending cap for PPL Electric’s Phase V EE&C Plan is \$307,506,880, excluding
6 approximately \$5 million for the Company’s share of the Statewide Evaluator (“SWE”)
7 costs. The SWE costs are not subject to the cost cap per the Commission’s Implementation
8 Order entered on June 18, 2025, at Docket No. M-2020-3015228 (“*Phase V*
9 *Implementation Order*”). Thus, the Company’s total budget for its five-year Phase IV
10 EE&C Plan is approximately \$312.5 million when including the SWE costs.

11
12 **Q. How was that spending cap calculated?**

13 A. The \$307,506,880 cap is based on 2% of the Company’s total annual revenue as of
14 December 31, 2006, which was \$3,075,068,825. The Commission stated in its *Phase IV*
15 *Implementation Order* that the 2% cap applies to the annual budget and not the budget for
16 the entire phase of the EE&C Plan and made no updates to this policy in the *Phase V*
17 *Implementation Order*. Therefore, the approximately \$307.5 million budget is for the full
18 five-year period, derived from the 2% cap multiplied by \$3,075,068,825 (\$61,501,376 per
19 year for five years).

Q. How are the costs to design and develop the Company’s Phase V EE&C Plan reflected in its budget for the EE&C Plan?

A. The Commission has allowed the Company to include the costs to design and develop its Phase V EE&C Plan, and those costs incurred prior to the start of the Plan are permitted to be deferred. These costs are included in the \$312.5 million budget. PPL Electric proposes to amortize and recover those costs ratably over the five-year, or 60-month, life of its Phase V EE&C Plan.

Q. Please describe the Company’s proposed rate mechanism for recovering the costs of its Phase V EE&C Plan.

A. The Company plans to use the proposed ACR-5, which is a non-bypassable cost recovery mechanism under Section 2806.1(k)(1) of the Public Utility Code and is designed consistent with Section 1307 of the Public Utility Code. The Company will calculate its ACR-5 rate for each of its three customer classes in a similar manner to Phase IV – Residential, Small C&I, and Large C&I. For Residential customers, the ACR-5 will be recovered as a cents per kilowatt hour (“kWh”) component included in the distribution charge on the customer’s bill. For Small C&I customers, the ACR-5 will be recovered as a cents per kWh component and will be shown as a separate line item from other charges but combined with any Act 129 Compliance Rider – Phase 4 (“ACR-4”) charges, which have been recovering the costs associated with PPL Electric’s currently-effective Phase IV EE&C Plan. In other words, a Small C&I customer will see a single line item on the bill for all Act 129 charges. For Large C&I customers, the ACR-5 will be recovered as a cents per kilowatt (“kW”) component of the customer’s bill and will be identical to the Small

1 C&I bill presentment. All Act 129 charges (including ACR-4 and ACR-5) will be
2 identified as a single ACR line item shown separately from other distribution charges. For
3 Large C&I customers, the demand (kW) is the customer's PJM Interconnection LLC
4 ("PJM") peak load contribution and may change yearly.

5
6 **Q. How many different rates will be reflected in the ACR-5?**

7 A. Three different rates will be reflected in the Company's ACR-5. The three rates will be
8 for each of the Company's customer classes – Residential, Small C&I, and Large C&I.

9
10 **Q. Please describe how PPL Electric will set the annual rates under the ACR-5.**

11 A. PPL Electric Utilities proposes to calculate the ACR-5 on an annual basis according to the
12 forecasted program costs during that Phase V program year. The Company will complete
13 an annual reconciliation of the ACR-5 for each customer class by comparing ACR-5
14 revenues to actual expenses and will recover or refund any over- or under-collections in
15 the next ACR-5 year. If the Company determines that a customer class's ACR-5 rate, if
16 left unchanged, would result in a material over- or under-collection of Phase V Act 129
17 costs incurred or expected to be incurred during the current 12-month period, the Company,
18 in its discretion, may file with the Commission for an interim revision of the ACR-5 rate.

19 The Company also will include in each customer class's ACR-5 rate calculation the
20 E-factor or prior period over or undercollection for the respective customer class. This
21 over or undercollection will also be divided by expected kWh usage or kW demand for the
22 customer class. The current period rate and the E-factor rate will be combined and include

an adjustment for gross receipts tax to obtain the ACR-5 rate for the customer class for the period.

Q. Please describe PPL Electric's proposed reconciliation mechanism for the ACR-5.

A. In accordance with the Commission's *Phase V Implementation Order*, the Company proposes to file with the Commission a report of collections within 30 days following the end of each application year. This report will reconcile the ACR-5 for each of the three customer classes (*i.e.*, Residential, Small C&I, and Large C&I). The reconciliation will compare the actual expenses incurred and the actual revenues received for each of the customer classes for the period running April 1st to March 31st. No interest will be included monthly on the over or under collections, as directed by the Commission on page 248 of the *Phase V Implementation Order*.

Q. Will the Phase V cost recovery mechanism be a separate mechanism from the Phase IV cost recovery mechanism?

A. PPL Electric proposes to include any remaining ACR-4 over or undercollections in its ACR-5 E-factor, as described on pages 248 and 249 of the *Phase V Implementation Order*. This will effectively combine the ACR-4 with the ACR-5 effective June 1, 2026.

Q. Is the Company proposing to include any capital costs as part of its ACR-5?

A. No.

1 **Q. Is the Company proposing to include any EE&C Plan-related costs that have been**
2 **claimed and permitted recovery in base rates?**

3 **A. No.**

4

5 **Q. Does this conclude your direct testimony?**

6 **A. Yes, it does. However, I reserve the right to supplement my testimony.**

PPL Electric Exhibit KA-1



PPL Electric Utilities Corporation

GENERAL TARIFF

RULES AND RATE SCHEDULES FOR ELECTRIC SERVICE

In the territory listed on pages 4, 4A, and 4B
and in the adjacent territory served.

ISSUED: TBD

EFFECTIVE: TBD

CHRISTINE M. MARTIN, PRESIDENT

827 Hausman Road
Allentown, PA 18104

NOTICE

THIS TARIFF MAKES CHANGES **(C)** IN EXISTING RATES. SEE PAGE TWO.

PPL Electric Utilities Corporation

ACT 129 COMPLIANCE RIDER – PHASE 5

A Phase 5 Act 129 Compliance Rider (ACR 5) shall be applied, on a non-bypassable basis, to charges for electricity supplied to customers who receive distribution service from the Company under this Tariff. The ACR 5 will be implemented beginning June 1, 2026.

The ACR 5 shall be computed separately for each of the following three customer classes:

- (1) Residential: Consisting of Rate Schedules RS and RTS (R),
- (2) Small Commercial and Industrial (Small C&I): Consisting of Rate Schedules GS-1, GS-3, BL, SA, SM (R), SHS, SLE, SE, TS (R), and GH-2 (R), and
- (3) Large Commercial and Industrial (Large C&I): Consisting of Rate Schedules LP-4, LP-5, LPEP, and L5S.

The ACR 5 will be computed for each customer receiving distribution service from the Company using the formulae described below. For residential customers, the ACR 5 charge shall be included in the distribution charges on a kWh basis of the monthly bill. For all other customers, the ACR charge shall be listed as a separate charge on the monthly bill. All charges shall be reconciled on an annual basis for undercollections and overcollections experienced during the previous year. Charges set forth in the residential rate schedules in this tariff have been adjusted to reflect application of the currently effective ACR 4.

The ACR 5 for the Residential class and the Small C&I class shall be computed using the following formula:

$$\text{ACR 5} = [\text{ACc}/\text{S} - \text{E}/\text{S}] \times 1 / (1-\text{T})$$

The ACR 5 for the Large C&I class shall be computed using the following formula:

$$\text{ACR 5} = [\text{ACc}/\text{D} - \text{E}/\text{D}] \times 1 / (1-\text{T})$$

Where:

ACc = An annual budget of all costs required for the Company to implement its proposed Phase 5 Energy Efficiency and Conservation (EE&C) Plan during a compliance year. A compliance year is the 12-month period beginning June 1 of each calendar year and ending May 31 of the following calendar year. The annual project program cost is the sum of all direct and indirect costs (including all deferred design and development costs, general administrative costs, and applicable statewide evaluator costs) required to implement the Company's EE&C Plan divided by the number of months in the Company's EE&C Plan for the given application year. All deferred design and development cost, general administrative costs, and applicable statewide evaluator costs will be amortized over a 60-month period.

The costs of each EE&C program available to only one customer class will be directly assigned to that customer class. Costs of EE&C programs which cannot be directly assigned to one customer class will be allocated to the customer classes benefiting from those programs using an allocation factor determined by dividing the EE&C costs directly assigned to each customer class by the total of the Company's EE&C Plan costs directly assigned to all customer classes.

(Continued)

PPL Electric Utilities Corporation

ACT 129 COMPLIANCE RIDER – PHASE 5 (CONTINUED)

- D = For the Large C&I customer class, the total of the monthly billing demands for all customers in the class, projected for the computation year. The peak demand will be based on the customer's peak load contribution to the PJM peak load during the prior PJM Planning Year.
- E = Net over or undercollection of the ACR 5 charges as of the end of the 12-month period ending March 31 immediately preceding the next compliance year. Reconciliation of the ACR 5 will be conducted separately for each of the three customer classes based upon the actual expenses incurred and actual revenues received for each customer class. No interest shall be computed monthly on over or undercollections. The reconciliation of ACR 4 revenues and expenses shall be adjusted during the 2027 – 2028 ACR 5 application year to reflect actual data for the months of April and May 2026, as well as any expenses incurred prior to May 31, 2026, but paid after that date.
- S = The Company's total billed KWH sales in each customer class who receive distribution service under this tariff (including distribution losses), projected for the computation year.
- T = The total Pennsylvania gross receipts tax rate in effect during the billing period, expressed in decimal form.

The ACR 5 shall be filed with the Pennsylvania Public Utility Commission (Commission) by May 1 of each year. The ACR 5 charge shall become effective for distribution service provided to all customers on or after the following June 1, unless otherwise ordered by the Commission, and shall remain in effect for a period of one year, unless revised on an interim basis subject to the approval of the Commission. Upon determination that a customer class's ACR 5, if left unchanged, would result in a material over or undercollection of Phase 5 Act 129 Compliance costs incurred or expected to be incurred during the current 12-month period ending May 31, the Company may file with the Commission for an interim revision of the ACR 5 to become effective ten (10) days from the date of filing, unless otherwise ordered by the Commission.

At the conclusion of the Phase 4 EE&C Plan on May 31, 2026, collections under the ACR 4 for each customer class will be reconciled to the total cost of the EE&C Plan allowed by the Commission for that customer class. Overcollections or undercollections will be reflected as a separate line item in the E factor calculation and will be refunded or recovered through application of the ACR 5 rate effective June 1, 2026 through May 31, 2027. If any over/under collection balance is expected to remain after March 31, 2027, the collection will be included in the ACR 5 rate going forward.

Minimum bills shall not be reduced by reason of the ACR 5 nor shall charges hereunder be a part of the monthly rate schedule minimum. The ACR 5 shall not be subject to any credits or discounts. The State Tax Adjustment Surcharge (STAS) included in this Tariff is applied to charges under this Rider. Charges under ACR 4 and ACR 5 will be combined for billing purposes only.

The Company shall file a report of collections under the ACR 5 within thirty (30) days following the conclusion of each compliance-year.

Application of the ACR 5 shall be subject to review and audit by the Commission at intervals it shall determine. The Commission shall review the level of charges produced by the ACR 5 and the costs included therein.

(Continued)

PPL Electric Utilities Corporation

ACT 129 COMPLIANCE RIDER – PHASE 5 (CONTINUED)

ACT 129 COMPLIANCE RIDER – PHASE 5 CHARGE

Charges under the ACR 5 for the period June 1, 2026 through May 31, 2027, as set forth in the applicable Rate Schedules.

Customer Class	Large C&I -	Small I&C	Residential
Rate Schedule / Charge	LP4, LP-5, and LPEP	GS-1, GS-3, BL, and GH-2 (R)	RS and RTS (R)
	\$X.XXX /KW	\$X.XXXXX /KWH	\$X. XXXXX /KWH

Small C&I – Street Lights										
Rate Schedule/ Charge	SA		SM (R)		SHS		SLE		SE	TS (R)
	Nominal Lumens	Charge	Nominal Lumens	\$/Lamp	Nominal Lumens	\$/Lamp	Nominal Lumens	\$/Fixture	\$/KWH	\$/Watt
	HPS 9,500	X.XXX \$/Lamp	3,350	X.XXX	5,800	X.XXX	2,600	X.XXX	X.XXX	X.XXX
			6,650	X.XXX	9,500	X.XXX	3,300	X.XXX		
			10,500	X.XXX	16,000	X.XXX	3,800	X.XXX		
	LED 4,300	X.XXX \$/Fixture	20,000	X.XXX	25,500	X.XXX	4,900	X.XXX		
			34,000	X.XXX	50,000	X.XXX	7,500	X.XXX		
			51,000	X.XXX			15,000	X.XXX		
							20,000	X.XXX		

VERIFICATION

I, KATELYN ARNOLD, being the Manager-Regulatory Strategy and Rates at PPL Services Corporation, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief and that I expect PPL Electric Utilities Corporation to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 relating to unsworn falsification to authorities.

Date: December 1, 2025

Katelyn Arnold
Katelyn Arnold (Dec 1, 2025 10:22:37 EST)

Katelyn Arnold

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Petition of PPL Electric Utilities Corporation for
Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan**

Docket No. M-2025-3057329

PPL Electric Utilities Corporation

Statement No. 1-R

Direct Testimony of Thomas McAteer

List of Topics Addressed:

**Other Parties' Issues and Recommendations Concerning the Residential, Non-Residential,
and Resource Constrained Programs**

Date: January 29, 2026

Rebuttal Testimony of Thomas McAteer

Q. Please state your full name and business address.

A. My name is Thomas McAteer, and my business address is 827 Hausman Road, Allentown, Pennsylvania 18104.

Q. By whom are you employed and in what capacity?

A. I am employed by PPL Electric Utilities Corporation (“PPL Electric” or the “Company”) as Manager of Energy Efficiency.

Q. Have you previously submitted testimony in this proceeding?

A. Yes. I submitted my direct testimony (PPL Electric Statement No. 1) in support of PPL’s petition for approval of its Phase V Energy Efficiency and Conservation Plan (“EE&C Plan” or “Plan”) that was filed with the Pennsylvania Public Utility Commission (“Commission”) on December 1, 2025, at Docket No. M-2025-3057329, in accordance with Act 129 of 2008 (“Act 129” or the “Act”), as well as the relevant Commission Orders for Phase V. *See Energy Efficiency and Conservation Program*, Docket No. M-2025-3052826 (Order entered June 18, 2025) (“*Phase V Implementation Order*”); *2026 Total Resource Cost (TRC) Test*, Docket No. M-2024-3048998 (Order entered Nov. 7, 2024) (“*2026 TRC Test Order*”) (collectively, “*Phase V Orders*”).

Q. Please briefly describe the subject matter of your rebuttal testimony in this proceeding.

A. I will respond to certain issues raised in the direct testimony submitted by the other parties' witnesses, specifically: (1) the direct testimony of Stacy L. Sherwood (OCA Statement No. 1) submitted on behalf of the Office of Consumer Advocate ("OCA"); (2) the direct testimony of Jim Grevatt (CAUSE-PA Statement No. 1) submitted on behalf of the Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA"); (3) the direct testimony of Jeaneen A. Zappa (KEEA Statement No. 1) submitted on behalf of the Keystone Energy Efficiency Alliance ("KEEA"); (4) the direct testimony of Angela Vitulli (OSBA Statement No. 1) submitted on behalf of the Office of Small Business Advocate ("OSBA"); (5) the direct testimony of Daniel Kaufman (OSBA Statement No. 2) submitted on behalf of the OSBA; and (6) the direct testimony of John Costlow (SEF Statement No. 1) submitted on behalf of the Sustainable Energy Fund ("SEF").

Q. Are you sponsoring any exhibits with your rebuttal testimony?

A. Yes, attached to my rebuttal testimony as PPL Electric Exhibit TM-1R are the following discovery responses served by the other parties in this proceeding: PPL to CAUSE-PA-I-2; PPL to CAUSE-PA-I-3; PPL to OSBA-I-2; PPL to OSBA-I-3; PPL to OSBA-I-5, PPL to OCA I-2; PPL to SEF-I-2; PPL to KEEA-I-2; and PPL to KEEA-I-2 Attachment 1. Also attached as PPL Electric Exhibit TM-2R is Table 9 of PECO's proposed Phase V EE&C Plan.

1 **Q. Do you have any general observations about the EE&C Plan and the other parties’**
2 **testimony?**

3 A. Yes, I do. First and foremost, no party has alleged in its direct testimony that the overall
4 EE&C Plan proposed by PPL Electric will fail to achieve the energy savings and peak
5 demand reduction targets set by the Commission. Indeed, the OCA affirmatively states
6 that the Company’s proposed EE&C Plan will meet or exceed the targets. (OCA Statement
7 No. 1, p. 7.) While OSBA and OCA express concerns regarding the projected savings for
8 non-residential lighting for Small Commercial and Industrial (“C&I”) customers, as
9 explained more fully below, these arguments fail to account for the holistic findings in the
10 Market Potential Study, which project that non-residential lighting will account for 62% of
11 all Small C&I program potential in the Company’s service territory. The Company’s
12 forecast for non-residential lighting accounts for 56% of the Small C&I forecast in Phase
13 V, which is below the Market Potential Study’s projected program potential. The OSBA
14 and OCA also acknowledge that the Plan is projected to be cost-effective as a whole. (See
15 OCA St. 1, p. 7; OSBA St. 1, p. 4.) Instead, the parties focus primarily on proposing
16 selective changes to the EE&C Plan.

17 Before addressing the parties’ specific proposed changes, I want to emphasize that
18 the Company developed its EE&C Plan after conducting extensive research and soliciting
19 input from its regular stakeholder meetings about the types of programs that customers
20 want and the types of EE&C programs that have been successful in the past. Based on this
21 research and stakeholder input, PPL Electric developed an integrated EE&C Plan that
22 offers a variety of programs and measures. The Plan was carefully crafted and balanced to

1 achieve the targets set forth by the Commission in its *Phase V Implementation Order* within
2 PPL Electric's budget.

3 The parties and the Commission also need to recognize that the Company cannot
4 simply modify one part of the EE&C Plan without addressing how those changes affect
5 other portions of the Plan, including: (1) how changes to one energy efficiency or demand
6 response measure would necessitate revisions to other measures in the Plan, cost allocation
7 to customer sectors, the total budget for the EE&C Plan, and the Low-Income sector
8 savings requirement; (2) how changes to a program would affect the cost-effectiveness of
9 that program and other programs; (3) how changes to a program would impact the cost-
10 effectiveness of the portfolio as a whole; (4) how changes would affect the preferences of
11 other stakeholders; and (5) how requested changes may or may not be consistent with Act
12 129 and how changes to a program would impact PPL Electric's ability to comply with Act
13 129 and the Commission's *Phase V Orders*.

14 In general, the other parties' testimonies simply offer proposed revisions to the
15 EE&C Plan without specific analysis or consideration of the other modifications that would
16 need to be made, the impact on the programs' and the portfolio's cost-effectiveness, the
17 impact on savings, and the impact on costs (i.e., what other programs or measures would
18 have to be cut to fund the party's proposed changes, and by how much). (See PPL Electric
19 Exhibit TM-1R.)¹ Moreover, it is important to recognize that changes requested by one
20 party likely could negatively affect the preferences of another party. As a result, PPL
21 Electric strongly believes that absent fatal flaws (such as non-compliance with the
22 objective requirements of Act 129 or the *Phase V Orders*), it is not in the public interest to

¹ I note that KEEA performed analyses related to its health and safety budget proposal.

1 continue to iterate, fine-tune, and rebalance the Plan at this time, particularly where the
2 opposing parties have presented no evidence as to the impacts of their individual proposals
3 on the Plan as a whole or other parts of the Plan. The parties can also review the progress
4 of the Plan and provide feedback following the release of semi and annual reports and
5 during stakeholder meetings.

6 In addition, some parties have averred that PPL Electric may not be able to meet
7 some of the estimates in the EE&C Plan, particularly related to the projected savings for
8 non-residential lighting. In response, I would like to point out that PPL Electric has a
9 proven track record of meeting its estimates and the Commission's requirements in Phases
10 I, II, III, and IV. The Company leveraged historical participation, a review of the pipeline
11 of known projects, and the impact of new business support offerings, to model Phase V
12 projections for non-residential without capping participation based on the Market Potential
13 Study. While the customer pool eligible for lighting improvements has softened due to
14 market saturation, there is continued customer demand and opportunity within the
15 Company's service territory based on the Company's ongoing experience with
16 participation levels in Phase IV. The Company is confident it can deliver the Phase V
17 EE&C Plan as expected, including the projected savings from non-residential lighting.

18 Finally, I want to stress that PPL Electric ultimately has the responsibility to comply
19 with Act 129 and the *Phase V Orders*. If the Company fails in that endeavor, PPL Electric
20 will be the one potentially facing substantial penalties, not the other parties. Therefore, as
21 a matter of fundamental fairness, PPL Electric should be permitted substantial flexibility
22 and discretion in developing and implementing its Plan. Also, if PPL Electric or its

1 stakeholders determine over time that this initial Phase V EE&C Plan requires certain
2 changes or fine-tuning, the Commission has established processes to revise the EE&C Plan.

3
4 **Q. Please explain how your rebuttal testimony is organized.**

5 A. I address the parties' proposals largely based upon the types of programs implicated.
6 Consequently, I have arranged my testimony into the following sections: (I) Residential
7 Program; (II) Resource-Constrained (Low-Income) Program; (III) Business (Non-
8 Residential) Program; (IV) Program Coordination; and (V) Miscellaneous, to address other
9 issues raised by the parties' witnesses.

10
11 **I. RESIDENTIAL PROGRAM**

12 **A. General**

13 **Q. OCA witness Sherwood states that she is concerned "that the Company has provided**
14 **excessive incentive ranges for certain measures offered under the [Residential Energy**
15 **Efficiency Program] Energy Efficient Homes component" and recommends that the**
16 **Company provide revised incentive ranges for this component in rebuttal. (OCA St.**
17 **No. 1, p. 19.) Do you share her concern?**

18 A. The Company does not share Ms. Sherwood's concern about the planned incentive ranges
19 under the Energy Efficient Homes component. Importantly, the incentive amounts
20 provided by the Company in Table 8 list the maximum planned incentive for the listed
21 measures. This approach provides the Company with flexibility in its incentive offerings
22 and follows the format used in previous Act 129 Phases. Providing a flexible incentive
23 range also allows the Company to consider new delivery channels and provides an option
24 if particular measures become more costly due to market changes. Importantly, the

1 Company does not plan to start incentive levels at the maximum levels indicated in Table
2 8. Incentive ranges are designed for flexibility in case of extreme and/or unexpected
3 market changes, not with the intention of paying incentives that are not cost-effective, and
4 are based in part on the current incremental cost (the additional cost to purchase a more
5 efficient version of the product). The Company anticipates that the two measures singled
6 out by OCA witness Sherwood will have starting incentive levels considerably lower than
7 the maximum level included in Table 8. For example, incentive levels for low-flow faucet
8 aerators were modeled in the plan to fall between \$0.75 and \$3.75 in the Residential Energy
9 Efficiency Program, depending on delivery channel during Program Year 18. The
10 incremental cost for ENERGY STAR ceiling fans shown in the Company's plan is \$488
11 based on early retrofit costs, which may be higher than other EDCs including PECO, which
12 use the retire on burnout incremental cost of \$252.74. The Company anticipates that the
13 incentive for ENERGY STAR ceiling fans will be \$375 per unit installed, which is below
14 the incremental cost, though is a higher percentage of the incremental cost because it is a
15 low-participation measure. Building in a higher incentive range will not result in excessive
16 incentives for the Plan, considering the Company uses well-founded models to establish a
17 reasonable starting point.

18
19 **B. Home Energy Reports**

20 **Q. OCA witness Sherwood recommends that the Company discontinue the use of Home**
21 **Energy Reports in Phase V and to re-allocate the funds for Home Energy Reports to**
22 **“longer-lived measures, including audits and rebates for weatherization and HVAC.”**
23 **(OCA St. No. 1, p. 15.) Do you agree with this recommendation?**

1 A. No. Home Energy Reports and the associated Energy Analyzer disaggregation tool, the
2 latter of which is available to all residential customers, are important tools for customer
3 education and program awareness. The Company does not over-rely on the measure, with
4 only 5% of the total portfolio energy consumption reduction provided by Home Energy
5 Reports and the reports ceasing in the last two years of Phase V. The Company has also
6 taken steps to improve the customer experience related to Home Energy Reports, including
7 removing similar home comparisons and reducing the cost of the report by removing paper
8 reports.

9
10 **Q. Ms. Sherwood states that she is concerned with the Company’s “significant reliance”**
11 **on Home Energy Reports for Residential Savings. (OCA St. No. 1, p. 13.) Does the**
12 **Company’s Phase V Plan place “significant reliance” on Home Energy Reports for**
13 **its projected residential savings?**

14 A. No, this is a misrepresentation of the impact of Home Energy Report energy savings
15 forecast in Phase V. As stated above, only 5% of the total portfolio energy consumption
16 reductions are derived from Home Energy Reports. The measure is also a valid
17 Pennsylvania TRM measure and, as such, is permitted and appropriate for Act 129.
18 Arbitrary limitations on eligible measures deprives the Company of necessary flexibility
19 to ensure compliance targets are met.

20
21 **Q. Ms. Sherwood also recommends that if Home Energy Reports are included for Phase**
22 **V, the Company include similar home comparisons, claiming that “[r]emoving these**
23 **comparisons could reduce program effectiveness, increase portfolio risk, and**

undermine Act 129 objectives.” (OCA St. No. 1, p. 15.) Do you agree with this recommendation?

A. No. The Company decided to remove the similar home comparison from the Home Energy Reports in Phase V due to direct customer feedback showing dissatisfaction with the similar home comparisons. While the Company recognizes that similar home comparisons provide relevant data to customers, PPL Electric is concerned that continuing the similar home comparisons in light of negative customer feedback will not serve the objectives of Act 129 and could lead to further customer dissatisfaction. There is no risk to the portfolio as a whole or of reduced program effectiveness due to the removal of similar home comparisons, as the energy savings forecast for Home Energy Reports includes a reduction based on the removal of similar home comparisons. The forecasted reduction was provided by the CSP subcontractor that provides the Home Energy Reports and has the necessary experience to estimate the impact of the change. Instead of similar home comparisons, customers may instead be shown a status of efficient, average, or fair as it relates to their home’s energy performance. This alternative rating will allow customers to evaluate the efficiency of their home energy use without drawing a direct comparison to other homes. In addition, the removal of similar home comparisons does not change the evaluation methodology used by the Company’s third-party evaluator CSP or the SWE as this evaluation is based on identifying energy savings for participants for the report overall, not specific elements of the report. Home Energy Reports offer a cost-effective means for the Company to provide a wide-range of customers with real-time insight into their homes’ energy efficiency. The Company should be afforded the ability to take advantage of this

1 proven TRM measure and the flexibility to incorporate customer feedback into the
2 measure's design.

3
4 **C. Residential Lighting**

5 **Q. Do you agree with OCA witness Sherwood's recommendation "that the Company**
6 **eliminate residential lighting measures as part of its portfolio and invest those funds**
7 **in longer-lived residential measures, such as HVAC and weatherization measures"?**
8 **(OCA St. No. 1, p. 11.)**

9 **A.** No. Residential lighting as part of the Residential Energy Efficiency program accounts for
10 less than 3,000 MWh of energy savings, or 0.003% of the total portfolio savings. In
11 comparison, measures such as HVAC replacement and service, and shell measures account
12 for almost 37,000 MWh in the Residential Energy Efficiency Program. For the Resource
13 Constrained Energy Efficiency Program, lighting only represents 2% of the total portfolio
14 savings. Most lighting opportunities for income-eligible customers are identified on site
15 by a qualified technician, ensuring that LED installation only occurs in eligible homes and
16 locations. In addition, the Company has removed LED lighting from the income-eligible
17 welcome kits designed to promote assessment participation. The Company's projections
18 for Phase V are reasonable considering the Company's successes during Phase IV. For
19 example, the Company's Program Year 16 annual report indicated an in-service rate for
20 LEDs of 98% for remote assessments and of 91% for on-site assessments, indicating both
21 proper installation of LED lighting and customer use. The Company expects continued
22 lighting opportunities for income-eligible customers in Phase V, especially for multifamily
23 occupants and tenants, a key underserved customer population that the Company is
24 prioritizing in Phase V.

D. Student Energy Education Component

Q. OCA witness Sherwood states that she is concerned with the inclusion of kits in the Student Energy Education Component of the Residential Program because “[t]he Company does not track the kit recipient’s information and as such does not know whether a household receives multiple kits and cannot conduct surveys regarding installation rates.” (OCA St. No. 1, p. 16.) As a result, Ms. Sherwood recommends that the Company continue to provide student education but discontinue the use of kits altogether. Do you share these concerns?

A. No, the concern misstates the evaluation process. In the Company’s Program Year 16 annual report, savings associated with kits provided through the Student Energy Education component of the Residential Program had a realization rate of 100% for both energy savings and peak demand reduction. This was based on the verified in-service rates in Program Year 15, which were confirmed by the SWE. To verify in-service rates, the Company’s CSP utilizes a Home Energy Worksheet (“HEW”) that asks questions to track the installation of items in the kits and collects participant information. The program offers small grants as incentives for teachers to return 25% or more of HEWs, with amounts starting at \$10 and going up to \$50 for response rates of 80% or more. Teachers are also requested to complete evaluation forms following their own participation. The Company’s third-party evaluator conducted in-depth interviews with school administration staff and leveraged the surveys from the HEW for over 15,000 participating students and teachers through both paper and online methodology. Thus, the assertion that the Company does not track in-service rates or conduct installation surveys is incorrect.

1 In addition, the Company takes reasonable steps to avoid providing multiple kits to
2 a single household, including by aligning our school outreach strategy and cohorts schedule
3 to reduce the likelihood of a customer receiving multiple kits. However, it should be noted
4 that the kits contain a limited number of measures, far fewer than would be required to
5 replace every product in an average home. If a customer were to receive additional
6 measures, the in-service rate for the measures would be captured through the HEW
7 associated with the additional kit and be reflected in the in-service rate and savings verified.
8 The results would still represent an accurate application of the products provided.

9
10 **Q. OCA witness Sherwood observes that “[o]ther EDCs in Phase V have proposed to use**
11 **welcome kits not as a program component but to encourage customers to participate**
12 **in their programs or to provide energy education.” (OCA St. No. 1, p. 17.) Please**
13 **respond to this observation.**

14 **A.** The Company currently utilizes welcome kits in Phase IV in the Residential Energy
15 Efficiency Program for customers starting new service in the territory. Customers are sent
16 a welcome communication and a link to select a kit, while receiving information about
17 other incentive opportunities offered by the Company. As such, kits are only sent if
18 specifically requested by the customer. The Company plans to do the same in Phase V.
19 For income-eligible customers, the Company currently provides welcome kits for those
20 newly enrolled in OnTrack, promoting the assessment option and encouraging customers
21 to take advantage of the offering. Company research in preparation of Phase V indicated
22 higher income-eligible customer awareness for those that received welcome kits, versus
23 those that do not.

1 Energy savings and peak demand reduction for both PPL Electric’s welcome kits
2 and its education kits are allowable per the Pennsylvania TRM and undergo an impact and
3 process evaluation, similar to any offering within the portfolio. Although other EDCs may
4 not include kits as a separate program component, I am personally aware that at least one
5 other EDC, PECO, will claim savings from its welcome kits in Phase V.² The Company
6 will also claim savings on all kit offerings, in alignment with Act 129.

7
8 **E. Conservation Voltage Reduction (“CVR”) Pilot**

9 **Q. Please describe the Company’s proposed residential CVR Pilot.**

10 A. The Company has elected to develop a pilot, coordinated with the Company’s third-party
11 evaluation and the SWE with an objective to examine feasibility, and if determined
12 feasible, design, create, and implement a methodology to reduce energy consumption and
13 peak demand through voltage optimization in front of the meter over approximately 24
14 months. The Company will establish weather-normalized feeder performance baseline
15 parameters to inform potential CVR savings estimates, support planning and evaluation of
16 any CVR deployment, and evaluate existing technology and software, including substation
17 line tap changers and voltage regulators, to determine viability. If the pilot is determined
18 to be feasible, the Company will establish parameters to safely and effectively reduce
19 voltage in front of customer meters to reduce energy consumption, track baseline voltage,
20 voltage adjustments, time on versus off, and overall energy impacts. The potential savings
21 related to the pilot were not included in the Plan’s forecasted savings.

² See PPL Electric Exhibit TM-2R, which is a copy of Table 9 of PECO’s Phase V EE&C Plan, which attributes savings to components of its welcome kits, including low-flow showerheads.

1
2 **Q. CAUSE-PA witness Grevatt recommends that the Commission reject the Pilot and**
3 **redirect the funds to the Resource Constrained program, arguing that it does not**
4 **comply with the Phase V Final Implementation Order and is “insufficiently**
5 **researched and conceived, and therefore unlikely to lead to viable savings toward Act**
6 **129 savings requirement.” (CAUSE-PA St. No. 1, pp. 9, 49-51.) Do you agree with**
7 **these recommendations?**

8 A. No. First, Mr. Grevatt’s speculation indicates his failure to consider that one of the primary
9 goals of the CVR Pilot is to study its feasibility and that the Company did not include
10 projected savings for this pilot program because it is still in its early stages of development.
11 As such, the Company’s decision not to include projected savings at this stage of
12 development was prudent and helps ensure that the Company will meet its compliance
13 targets in the event that it determines the CVR pilot is not feasible for Phase V. Second,
14 the Commission has specifically included front of the meter programs like the proposed
15 CVR pilot in Phase V. While Mr. Grevatt appears to be ideologically opposed to the
16 efficacy of these programs in EE&C plans generally, the Commission’s inclusion of these
17 measures in Phase V makes it appropriate for the Company to explore a CVR pilot as part
18 of its Phase V Residential Program. Finally, the Company should not be required to
19 redirect the budget for the CVR pilot to the Resource Constrained program if it is not
20 ultimately implemented in Phase V. The Company, as the entity ultimately responsible for
21 implementing the Plan and meeting the targeted savings for Phase V, should be afforded
22 the flexibility to redistribute funds for residential sector customers as it deems appropriate.
23

1 **Q. Please respond to OSBA witness Kaufman’s recommendation that the Company set**
2 **an initial funding cap to answer the initial question of whether the Company has the**
3 **existing technology to implement a CVR program. (See OSBA St. No. 2, p. 16.)**

4 A. The Company has allocated up to \$1 million for this pilot and the feasibility analysis is
5 included within this budget. Based on estimates from the third-party evaluator, the
6 Company expects the feasibility analysis costs to be less than 15% of the total pilot budget.
7 If the Company determines the CVR pilot is not feasible, it will not move forward with
8 planning and implementation. Thus, the Company does not believe imposing an initial
9 funding cap is necessary.
10

11 **Q. OSBA witness Kaufman also recommends that if the CVR pilot is implemented, the**
12 **Commission should require the Company to track the benefits and costs of the pilot**
13 **program and ensure they are assigned to the appropriate customer class. (OSBA St.**
14 **No. 2, p. 16.)**

15 A. PPL Electric will track the benefits and the costs of the CVR pilot according to customer
16 class and will assign them to the appropriate customer class. This is the Company’s
17 standard practice for all Act 129 Programs and will be followed if the CVR pilot is
18 implemented.
19

20 **II. RESOURCE-CONSTRAINED PROGRAM**

21 **A. Comprehensive Measures**

22 **Q. Mr. Grevatt claims that the term “‘comprehensive’” in the context of Act 129 has lost**
23 **meaning and should be discarded in favor of the terms ‘shallow savings’ to describe**
24 **measures and projects that have a small effect in reducing energy use and ‘deep**

1 **savings’ to describe measures and projects that have a significant effect in reducing**
2 **energy use . . .” (CAUSE-PA St. No. 1, p. 26.) Do you agree?**

3 A. No, I do not. The term comprehensive is well-defined by the Commission; measures
4 described as comprehensive can be found in Table 8 Addendum of the Phase V Plan
5 Template. The Company’s definition for comprehensive measures in the context of Act
6 129 fully aligns with the Commission’s definition. The proper time to challenge how the
7 Commission has chosen to define comprehensive measures was when the Plan Template
8 was released. It should also be noted that all measures within the Pennsylvania TRM are
9 eligible and in alignment with Act 129 and the Company must utilize a robust mixture of
10 measures to deliver a cost-effective Plan within the budget cap and to reach all compliance
11 targets, including the low-income target for Phase V.

12
13 **Q. Do you agree with CAUSE-PA witness Grevatt’s claims that PPL Electric “has placed**
14 **a high level of prioritization on shallow measures that will do little to reduce the**
15 **energy burdens of PPL’s low-income households”? (CAUSE-PA)**

16 A. No. PPL Electric provides many comprehensive measures in its Phase V EE&C Plan.
17 These comprehensive measures include Air Sealing, Window Heat Pumps, Ceiling, Attic,
18 Wall, Floor and Rim Joist Insulation, Basement and Crawlspace Insulation, Heat Pump
19 Water Heaters, Duct Sealing, ECM Circulation Fans, Ductless Heat Pumps, and Energy
20 Star Refrigerator and Freezer replacements when paired with eligible comprehensive
21 measures as defined by the Commission. PPL Electric must design its Low-Income
22 Program to meet the *Phase V Implementation Order’s* target of achieving 7.9% of total
23 plan savings from the Low-Income sector while staying under total Plan budget

requirements. This requires the Company to provide lower cost measures such as direct install measures, appliance recycling, and smart thermostats. Savings from these measures are verifiable and can be evaluated appropriately to ensure positive energy impacts for the Company's customers, regardless of how Mr. Grevatt chooses to define them.

Q. Please respond to Mr. Grevatt's recommendation that the Company "rebalance its proposed measure mix in the [Resource Constrained Program] such that a combination of building insulation and air sealing measures and efficient heat pumps and heat pump water heaters comprise 25% of the low-income portfolio savings for Phase V." (CAUSE-PA St. No. 1, p. 35.)

A. Notably, while Mr. Grevatt recommends that the Company redesign the Resource Constrained Program measure mix to achieve 25% of savings from comprehensive measures, he has not performed any formal studies on whether his suggestions are cost-effective or how they will affect the overall Plan budget. (PPL Electric Exhibit TM-1R [PPL to CAUSE-I-2].) Mr. Grevatt also acknowledged in discovery that no other EDC is projected to meet his proposed 25% threshold in their Phase V EE&C Plans. (PPL Electric Exhibit TM-1R [PPL to CAUSE-I-3].) In addition, the Commission already rejected this proposal to require EDCs to achieve a minimum of 25% of the low-income savings goal through comprehensive, whole-home programs. In the *Final Implementation Order*, the Commission stated, "We disagree with stakeholders' suggestions to set specific targets and more specific definitions of comprehensive programs." *Final Implementation Order*, p. 52. The Company does not have the luxury of looking at measures in a vacuum but must always consider the impact of specific measures on the Plan holistically. The

comprehensive measures identified by Mr. Grevatt have an incentive cost per kWh that is approximately 15 times greater than the overall average incentive cost per kWh for the Resource Constrained Energy Efficiency Program. As such, the cost to acquire 25% of the portfolio from comprehensive measures is simply not feasible while remaining within the statutory budget cap. For Phase V, PPL Electric has significantly increased its commitment to comprehensive measures by increasing the budget for these comprehensive measures from up to \$2.0 million per the Phase IV Joint Petition for Settlement, to approximately \$7 million in Phase V. The Company's significant investment in these measures in Phase V addresses the underlying concern raised in Mr. Grevatt's testimony while ensuring that the Company's Plan is cost-effective.

B. Appliance Recycling Component

Q. CAUSE-PA and OCA argue that the savings from the Company's proposed Appliance Recycling component should not be counted toward the low-income carve-out target for Phase V because they claim it is not solely dedicated to low-income customers. (See CAUSE-PA St. No. 1, pp. 37-39; OCA St. No. 1, pp. 18-19.) Do you agree?

A. No. This component includes the scheduling, free pick-up, and environmentally responsible recycling of a variety of appliances, including refrigerators, freezers, dehumidifiers, room air conditioners, and other appliances for verified low-income customers. The Company intends to promote other Resource Constrained Energy Efficiency Program offerings during the appointment, including energy assessments, and encourage participation in other assistance programs, such as OnTrack. The Company will

1 also enhance relationships with retailers by selling new appliances in resource-constrained
2 communities, and prevent the resale of units on the secondary market. The marketing
3 strategy will leverage all available information to ensure income-eligible customers
4 participate at representative rates throughout Phase V by leveraging Company and CSP
5 segmentation data, publicly available information, and other similar resources to generate
6 income-eligible-specific communication strategies. Only customers verified through
7 SWE-approved evaluation methodologies to be at or below 150% of FPL will be counted
8 towards the Company's low-income compliance targets. This includes verifying On-Track
9 enrollment status of participating customers. Moreover, it is fundamentally unfair to
10 prohibit Company from including verified savings from verified low-income participants
11 in its low-income carve out for Phase V simply because in prior phases the Company did
12 not previously have a dedicated low-income appliance recycling program. In Phase IV,
13 PECO had a dedicated low-income version of their appliance recycling program and plans
14 to include appliance recycling in their low-income offering in Phase V. Similarly, First
15 Energy, through the Products component of their Low-Income Energy Efficiency Program
16 also plans to offer appliance recycling. PPL Electric's dedicated low-income Appliance
17 Recycling component will be directly marketed to underserved customers, a marketing
18 strategy that is not included in FirstEnergy's or PECO's Phase V Plans. Neither CAUSE-
19 PA nor OCA raise similar concerns with the Resource Constrained Energy Efficient Homes
20 component, although the measures offered, including home energy audits, mirror those
21 offered in the Residential Energy Efficient Homes component, which also offers a free
22 virtual assessment. Instead, CAUSE-PA and OCA seem focused on shifting the
23 Company's low-income programming toward energy audits and weatherization measures.

Ms. Sherwood also acknowledges that the Company is “focusing the majority of the first-year savings on [providing audits and weatherization measures] (approximately 83%).”³ Appliance Recycling only accounts for approximately 7% of the Company’s forecasted energy savings for the Resource Constrained Energy Efficiency Program. In order to meet the low-income reduction targets for Phase V, the Company has to offer a mixed portfolio of a wide range of measures and cannot solely focus on weatherization and energy audits.

C. Student Energy Education Component

Q. CAUSE-PA witness Grevatt raises the same concerns with the Student Energy Education component, arguing that any savings from this component should not be counted toward the low-income carve-out because it is not “directed solely at low-income customers as required by the Commission.” (See CAUSE-PA St. No. 1, pp. 37-38.) Please respond.

A. As I stated above, PPL Electric disagrees with this characterization and maintains that verified savings attributable to low-income customers should be counted toward the low-income carve-out for Phase V. The Student Energy Efficiency Education component will provide in-class presentations and/or school-based events to educate students, including income-eligible students, and their families about energy safety, use, management, and conservation through hands-on activities, discussions, and multimedia. The Company will arrange contests and challenges to provide the students and educators with additional opportunities to engage with the material and demonstrate energy efficiency learnings. Participating educators will receive lesson plans, training information, materials, and/or

³ OCA St. No. 1, p. 18.

energy efficiency products to help reinforce energy efficiency education before and after the presentations. Schools will be identified using publicly available data, providing insight into districts that have a majority of households at or below 150% of the federal poverty level, though savings will only be counted towards the Company's low-income target based on SWE approved methodology that accurately measures the correct percentage of eligible households. This may include updating the HEW survey or other evaluation strategies approved by the SWE. Similar to Appliance Recycling, the Company does not rely on the Student Energy Education component for the majority of savings for the Resource Constrained Energy Efficiency Program, forecasting it to be approximately 10% of the program.

Q. Similarly, OCA witness Sherwood states that “[n]o savings from the School Education component should be counted towards the low income carve-out target unless the installation can be verified that it was installed in an income eligible household” and recommends that the funds be reallocated to weatherization measures. (OCA St. No. 1, p. 17.) Please respond.

A. The Company has already significantly increased comprehensive measure funding in Phase V as compared to Phase IV and a balanced array of measures is necessary for both meeting compliance targets as well as providing value to customers. The Student Energy Education component provides critical early education around electrical safety, energy efficiency, and sustainability for students that is appropriate for their education level. The kits are an integral part of that experience, as students can work with a trusted adult to install Pa TRM-eligible measures in their home. As noted above, the Company's CSP will utilize a Home

1 Energy Worksheet that asks questions to track installation rates of items in the kits and
2 collects participant information. This information, along with participant online and paper
3 surveys, informs the in-service rates for measures provided through this component,
4 collects demographic information such as heating and water heater fuel, cool system type,
5 number of occupants, and other data points, as well as customer satisfaction feedback. As
6 noted elsewhere, the Company will work with the SWE to develop an approved evaluation
7 methodology. Reallocating the funding to the Efficient Homes component would lead to
8 a reduction of energy savings of almost 5,000 MWh due to the higher acquisition costs for
9 those measures. As described elsewhere, the Company must maintain a varied portfolio of
10 measures to not only ensure robust comprehensive measures, but also an ability to meet
11 compliance targets.

12
13 **Q. Do you agree with CAUSE-PA and OCA that in order to count savings for a low-**
14 **income program toward the low-income carve-out, the Company's low-income**
15 **programming cannot be modeled on the Company's successful Appliance Recycling**
16 **and Student Energy Education Residential program components?**

17 A. No. The Commission requires that savings included in the low-income carve-out must
18 come from programs "solely directed at low-income customers or low-income-verified
19 participants in multifamily housing programs."⁴ Here, the Company has proposed stand-
20 alone programs for low-income customers based on proven successes from existing
21 Residential programs. Building upon those models, the Company has created dedicated
22 low-income program components with their own budgets and savings targets that will

⁴ See Phase V Final Implementation Order, p. 55.

1 employ targeted marketing plans to reach underserved populations. As noted above, the
2 Company's Residential and Resource Constrained Energy Efficient Homes components
3 deploy similar measures to different customer segments. I see no reason to limit the
4 Company from offering stand-alone programs to low-income customers so long as the
5 Company can verify the recorded savings come from income-eligible customers.
6 Requiring the Company to develop wholly unique and novel offerings for low-income
7 customer programming instead of employing proven methods is unreasonable. The
8 Company believes that expanding targeted offerings to low-income customers using valid
9 TRM measures is not only reasonable but responsive to the requirements of Act 129 and
10 the Commission's *Final Implementation Order*.

11
12 **D. Home Energy Reports**

13 **Q. CAUSE-PA and OCA also argue that no savings from Home Energy Reports should**
14 **be counted toward the low-income carve-out in Phase V and argue against their**
15 **inclusion in the Resource Constrained Program. Do you agree with these**
16 **recommendations?**

17 **A.** No. Home Energy Reports are an effective and useful educational tool that ensures
18 customers receive tips on improving energy efficient behavior and are provided
19 recommendations for other program offerings. The Company did not forecast energy
20 savings for the Resource Constrained Energy Efficiency Program for Home Energy
21 Reports in the Company's EE&C Plan; removing the offering altogether deprives income-
22 eligible customers of a valuable educational and communication pathway – it would not be
23 equitable or necessary to remove it.

E. Health & Safety

Q. Please describe the Health & Safety funding planned for the Company's Phase V Plan.

A. The Company allocated \$750,000 for the remediation of barriers to comprehensive measures in Phase IV. This funding was exhausted with approximately six months remaining in the Phase. As part of the Company's commitment to comprehensive measures, the Company elected to increase the amount of dedicated health and safety funding up to \$1.5 million in Phase V, with additional funding possible with a plan change, if necessary. These funds will help alleviate electrical, plumbing, and building shell issues that prevent the installation of comprehensive measures such as HVAC replacement, insulation, and air sealing.

Q. KEEA recommends that the Company dedicate an additional \$1 million to mitigating Health & Safety issues during Phase V, or \$500,000 per year. (See KEEA St No. 1, pp. 12-14.) Do you agree with this recommendation?

A. No. As described above, the Company is building upon the success of the Health & Safety Pilot launched in Phase IV by dedicating \$1.5 million in funds to mitigating health and safety issues in Phase V. PPL Electric believes that doubling the Health & Safety budget for Phase V is more than sufficient, and no additional funds need to be devoted to these measures at the expense of other programs. This determination was made based on a review of the Phase IV health and safety pilot, the projections of comprehensive measures in Phase V, and the required health and safety budget to resolve likely issues. If additional funding

1 is needed, the Company will evaluate allocating contingency funding for that purpose, if
2 necessary. The Company also notes that both OCA and CAUSE-PA appear to support the
3 Company's Health & Safety budget for Phase V as proposed.⁵
4

5 **Q. KEEA witness Zappa claims that “[a]necdotal evidence suggests up to 30% of**
6 **prospective program participants are deferred from services due to health and safety**
7 **issues . . .” (KEEA St. No. 1, p. 10.) Does this match the Company’s experience**
8 **administering Health & Safety funds in Phase IV?**

9 A. No. While the Company agrees that health and safety issues are a real issue and the
10 anecdotal metric cited may be accurate for other territories and/or programs, the funding
11 allocated in Phase IV to resolve barriers to health and safety led to under ten deferrals for
12 the entire Phase IV. In fact, the Company had no deferrals for Program Years 13 through
13 15. In Phase IV, 639 customers received health and safety funding, with an average budget
14 of approximately \$1,174 needed to remediate the identified issues. The Company provided
15 comprehensive assessments for 4,620 customers during Program Year 16, with only 5
16 deferrals in that period. While those customers were deferred from specific measures, all
17 customers still received assessments and other eligible measures that could be safely
18 installed. The Company's actual experience in Phase IV and successful implementation of
19 a health and safety pilot should be credited over KEEA witness Zappa's anecdotal
20 evidence. As such, the Company maintains that the proposed doubling of the health and
21 safety budget for Phase V is sufficient.
22

⁵ See CAUSE-PA St. No. 1, pp. 39-41; OCA St. No. 1, pp. 18-19.

1 **Q. KEEA recommends that the Company “adopt the Healthy Home Evaluator**
2 **certification as a requirement for contractors” in order to address health and safety**
3 **issues in Phase V. (KEEA St. No. 1, p. 14.) Do you agree with this recommendation?**

4 A. No. The Healthy Home Evaluator certification offered by the Building Performance
5 Institute is a supplemental standard building analysis certification, which trains technicians
6 to evaluate whole home safety and health issues, such as radon, lead detection, and asthma
7 triggers, which are not resolved or addressed through Act 129 Programs. The Company’s
8 assessment and audit technicians performing comprehensive audits are required to possess
9 Building Performance Institute Building Analyst certification, which is used to safely test
10 building conditions and assess energy efficiency measure potential. Barriers to potential
11 measure application are identified as part of this assessment. Act 129 is an energy
12 consumption reduction program by statute and is not designed to address non-energy issues
13 in a home. In addition, health and safety funding is limited to resolving specific barriers
14 and is not designed to identify and address whole home environmental hazards – the
15 purpose of the certification recommended by Ms. Zappa.

16
17 **III. BUSINESS ENERGY EFFICIENCY PROGRAM**

18 **A. Non-Residential Lighting**

19 **Q. OSBA witness Vitulli and OCA witness Sherwood raise concerns with the Company’s**
20 **projected savings for non-residential lighting in Phase V. Please summarize their**
21 **concerns and recommendations.**

22 A. OSBA witness Vitulli argues that the Company’s projected savings for Small C&I lighting
23 “is not realistic due to its misalignment with the 2025 market potential study and its

1 overreliance on lighting,” and recommends that the Commission reject the Phase V Plan
2 unless PPL Electric adjusts its savings projections for the Small Commercial and Industrial
3 (“C&I”) sector to “adequately align energy savings projections with the 2025 Market
4 Potential study by reducing reliance on lighting.”⁶ Similarly, OCA witness Sherwood
5 recommends that “commercial portfolio should limit lighting energy savings to 40% in PY
6 18, declining annually over Phase V to acknowledge the maturation of the commercial
7 lighting market.”⁷

8
9 **Q. Please respond to these concerns and recommendations regarding non-residential**
10 **lighting.**

11 A. The Market Potential Study (“MPS”) is designed to provide guidance and conservative
12 estimates of achievable savings, which incorporate assumptions about customer adoption,
13 market barriers, incentive levels, and budgetary limitations. As a result, particular
14 measures and/or end uses can overperform the MPS when market conditions are right or
15 when program design and customer engagement strategies supersede the study’s original
16 assumptions. The Commission does not require an analysis of all end use categories to
17 ensure alignment with the MPS and further, the Commission in its Implementation Order
18 notes numerous places that EDCs require flexibility as the organizations taking on the risk
19 of non-compliance and penalties, stating “EDC flexibility is a key theme in this Order.”
20 (*See Final Implementation Order*, p. 155).

⁶ See OSBA St. No. 1, pp. 2-3, 11-12.

⁷ See OCA St. No. 1, p. 11.

Arbitrarily capping potential participation at 40% not only reduces program flexibility but is itself out of alignment with the MPS, which shows Non-Residential lighting accounting for 62% of all SCI program potential in the Company's service territory. The Company's forecast for Non-Residential lighting accounts for 56% of the SCI forecast in Phase V. The Company leveraged historical participation, a review of the pipeline of known projects, and the impact of new business support offerings, to model Phase V projections without capping participation based on the MPS. While the customer pool eligible for lighting improvements has softened due to market saturation, there is continued customer demand and opportunity within the Company's service territory justifying the higher forecast noted by OSBA. Part of this demand stems from unrealized Phase IV potential due to low first year Phase IV participation because of the pandemic, which followed a slow-down and wait list at the end of Phase III, as well anticipated participation opportunities for small businesses in Phase V. The Company will enter Phase V with a robust contractor network, established customer relationships, and customer-focused participation requirements. The Company has enhanced this approach in Phase V to include Business Support Services, which includes virtual commissioning, building operator certifications, strategic energy management, benchmarking and financing to help identify additional opportunities and remove barriers. The expanded business services planned for Phase V will create new, accessible opportunities for customers and we anticipate that participation overall will remain strong, though note that the Company's forecast for PY22 is 26% lower than PY18, taking into account decreasing opportunities over time.

B. Tracking and Reporting

Q. In her direct testimony, OSBA witness Vitulli argued that the Small C&I sector is bearing a “disproportionate share of Upstream/Midstream incentive costs” and recommends that PPL Electric should be required to reallocate the budget to match the projected participation for this sector for Phase V. (OSBA St. No. 1, pp. 9-10.) Do you agree with Ms. Vitulli?

A. No. Small C&I customers do not bear a disproportionate share of upstream/midstream incentive costs because costs are only allocated to a customer sector following confirmation that they received benefits. For costs that are forecasted but benefits not received, they are returned to customers through the reconciliation process. I also note that Ms. Vitulli later withdrew this recommendation in discovery. See PPL Electric Exhibit TM-1R [PPL to OSBA-I-3].)

Q. OSBA witness Vitulli recommends that the Company “track the number of small business participants in the Company’s EE&C programming and include that figure in its annual reports.” (OSBA St. No. 1, p. 3.) Do you agree with this recommendation?

A. Yes, the Company agrees that tracking small business participation in its programming will help the Company evaluate its Plan’s ability to reach the small business community. As such, the Company will track small business participants during Phase V and include that figure in its annual reports.

1 **Q. OSBA witness Vitulli also recommends that the Commission require PPL Electric to**
2 **“disaggregate process evaluation results for the Non-Residential Program by**
3 **customer sector, showing breakouts for Small C&I and Large C&I.” (OSBA St. No.**
4 **1, p. 3.) Do you agree with this recommendation?**

5 **A.** Yes, the Company agrees to disaggregate the small and large commercial industrial sectors
6 in process evaluation results as part of the annual report process.
7

8 **C. Peak Demand Reduction Pilot**

9 **Q. OSBA witness Kaufman recommends that the Company conduct an evaluation of the**
10 **Peak Demand Reduction pilot no later than 12 months after the start date and to**
11 **conduct quarterly assessments of the pilot’s progress. (OSBA St. No. 2, p. 9.) Do you**
12 **agree with these recommendations?**

13 **A.** Yes, in part. PPL Electric agrees that conducting an evaluation 12 months after the start
14 date of the pilot could provide valuable information regarding process and participation.
15 The Company already conducts quarterly business reviews for all programs, which include
16 CSPs, to evaluate progress, review performance metrics and participation, and look for
17 process improvements. The pilot will be a part of this existing quarterly review process.
18

19 **Q. OSBA witness Kaufman also recommends that the Company increase the scope of the**
20 **pilot “by recruiting a larger number of SC&I participants for the initial pilot, if**

1 **possible given funding limitations.” (OSBA St. No. 2, p. 9.) Please respond to this**
2 **recommendation.**

3 A. The limited number of participants is a result of the incentive levels needed to ensure full
4 customer participation throughout the pilot without attrition. Daily load shifting is a novel
5 and unproven approach to demand response, and the Company wants to ensure a robust
6 pilot, with low attrition, so that the results can be assessed for potential wider
7 implementation. As such no opportunity exists to increase participation at this time, though
8 the number of participants was deemed adequate to evaluate the impact of the pilot. If the
9 pilot is successful, the Company will evaluate the potential to expand the scope of the pilot
10 into an offering for additional participants, dependent on available contingency funding.

11
12 **Q. OSBA witness Kaufman expresses concern that participants in the Peak Demand**
13 **Reduction pilot may rely on fossil fuel generators during a peak demand event and**
14 **recommends “that the Commission exclude diesel and other fossil fuel backup**
15 **generators from receiving incentives under the [Peak Demand Reduction] program.”**
16 **(OSBA St. No. 2, p. Do you share Mr. Kaufman’s concern?**

17 A. No. Mr. Kaufman’s concern is related to peak demand events, which are large peak load
18 reductions in response to weather events, capacity issues, and other isolated periods of grid
19 strain. Demand response in Phase V of Act 129 is designed to be a daily load shift
20 organized around specific hours, each day, across the winter and summer seasons – there
21 are no events. The daily peak load shift will have an incremental impact on customers, not
22 requiring back up generation, including diesel or other fossil fuels. As such, there is no
23 need to limit access to the pilot based on backup generation fuel. Also, I am advised by

counsel that excluding customers from the pilot program based on their back up generation fuel service could constitute discriminatory service in violation of the Public Utility Code.

D. Solar and Combined Heat and Power (“CHP”) Participation

Q. OSBA witness Kaufman expresses concern that the Company may not be able to achieve the Solar PV targets included in the Plan and recommends that the Company “clarify how (if at all) the Company adjusted its projections for Phase V to reflect the current policy and economic climate and provide evidence that the Company’s projections are feasible.” (OSBA St. No. 2, p. 14.) Do you share his concerns?

A. No. The Company has direct, ongoing conversations with key market actors related to solar PV, including trade allies, distributors and manufacturers, as well as customers. While the reduction of federal incentives will reduce the feasibility of some projects, customers and trade allies indicate that rising generation costs, as well as other increasing business costs, make both solar PV not only cost-effective, but also in alignment with many customer business plans. Utility incentives to reduce project costs are increasingly important due to the reduction in federal incentives. The Company has a robust, long-term pipeline of 32 projected Phase V solar projects, currently totaling 15 MW across the phase. This is almost 90% of the Company’s EE&C Plan Forecast for solar already identified. The Company is confident in its forecasts.

Q. OSBA witness Kaufman also states that he is “not entirely” confident that the Company will achieve the CHP targets included in the Plan and states that PPL Electric “should provide further evidence that its CHP projections are feasible before

1 **the Commission approves the Plan.” (OSBA St. No. 2, p. 14.) Please respond to this**
2 **recommendation.**

3 A. The SWE, in the Market Potential Study, noted that while these projects are complex,
4 significant savings potential exists for CHP installations in Pennsylvania. The Company’s
5 forecast for CHP across both small and large commercial industrial customers is only ten
6 projects for the entirety of Phase V, totaling approximately 60,123 MWh and 7.6 MW.
7 This is 37% below the potential savings for the Company noted by the SWE in the MPS
8 and remains a reasonable and achievable forecast.

9
10 **IV. PROGRAM COORDINATION**

11 **Q. OCA witness Sherwood recommends that the Company “commit to including**
12 **engagement of Act 129 programs during the interconnection and economic**
13 **development process.” (OCA St. No. 1, p. 7.) Please respond to this recommendation.**

14 A. The Company agrees that early engagement is crucial for customer awareness of programs
15 and already provides information related to Act 129 offerings at multiple places in the
16 customer journey, especially as it is related to new service and interconnection. These
17 engagement activities are already taking place in Phase IV and will continue in Phase V.
18 This includes collaboration with Key Account Managers and Business Accounts Services,
19 which routinely communicate with commercial and industrial customers, highlighting
20 applicable energy efficiency offerings based on customer need and interest. The Energy
21 Efficiency & Conservation team also has regular, recurring meetings with the
22 Interconnection team to discuss projects, timelines, incentives, and other critical
23 information to ensure customers receive the best possible outcomes, including for Act 129

1 participation. The team also collaborates closely with the Company's Manager of
2 Economic Development as well as the Company's national accounts team to ensure
3 potential new customers to the territory fully understand all services, programs, and
4 incentives available through Act 129 so these offerings can be included at key decision
5 points for the customer. The Company commits to continuing these existing, robust
6 coordination processes throughout Phase V.

7
8 **Q. OSBA witness Vitulli and KEEA witness Zappa recommend that the Company**
9 **develop more formal processes to support the braiding of funds between the**
10 **Company and the Pennsylvania Department of Environmental Protection ("PA**
11 **DEP"). (See OSBA St. No. 1., pp. 3, 11; KEEA St. No. 1, p. 17.) Do you agree with**
12 **these recommendations?**

13 A. Yes, in part. To clarify, there is a Commission-directed formal effort underway related to
14 data sharing, and Company is actively working with the PA DEP through the Data Sharing
15 Working Group to develop a cross-EDC framework to ensure customer data is safe, yet
16 available, to parties that require it for program implementation. Additionally, the Company
17 has met directly with PA DEP and their program implementation vendor to better
18 understand their needs, program requirement and how program coordination in the
19 Company's territory may be successful. The Company committed to providing 100% of
20 ASHRAE level II multifamily audit costs for the forecast provided by PA DEP and its
21 vendor.

1 **Q. CAUSE-PA witness Grevatt recommends that “the Commission require that PPL**
2 **provide seamless coordination between its [Resource Constrained Program] and**
3 **LIURP including joint funding of projects and measures.” (CAUSE-PA St. No. 1, p.**
4 **47.) Do you agree with this recommendation?**

5 **A.** Yes, in part. The Company’s approach to coordination with LIURP is already seamless
6 for the customer. Coordination activities currently include joint marketing, integrated and
7 seamless customer intake, internal administrative collaboration and management
8 alignment, and consistent quality assurance and control approaches. Customers benefit
9 from avoiding applying to multiple programs while being placed in the program that best
10 aligns program offerings with their usage profile and income level. This has allowed both
11 Act 129 and LIURP to meet required targets, provide equitable measures regardless of
12 program path, while providing important referrals, education, and resources for income-
13 eligible customers. The Company is exploring additional ways to enhance coordination
14 including updating eligibility requirements for each program with the potential for cost-
15 sharing of measures. Updates will be provided via stakeholder meetings in Phase V. Mr.
16 Grevatt also expresses concern that customers that receive LIURP benefits are ineligible
17 to receive additional weatherization measures for 5 years. However, LIURP is governed
18 by the Company’s Universal Services and Energy Conservation Plan (“USECP”), and his
19 concerns regarding program eligibility would be more appropriately raised in a matter
20 dealing with that plan.

21
22 **Q. Mr. Grevatt also claims that the Company has not sufficiently explored coordination**
23 **with the major gas utility in its service territory, UGI Utilities, Inc. – Gas Division**

1 (“UGI Gas”), and “urge[s] the Commission to direct both PPL and UGI to work
2 diligently to resolve whatever obstacles prevent ongoing, successful collaboration.”

3 (CAUSE-PA St. No. 1, pp. 44-45.) Do you agree with this recommendation?

4 A. Yes, in part. The Company has an ongoing collaboration with UGI Gas in Phase IV,
5 utilizing a mutual subcontractor to provide assessments on behalf of both companies. As a
6 result of this collaboration, 31 joint assessments were completed in Phase IV. However,
7 logistical issues prevented additional appointments and/or measures from being installed.
8 The primary challenges encountered involved coordinating schedules across multiple
9 parties, which created significant logistical difficulties. Data collection was problematic,
10 as the required information had to be gathered from two separate platforms in addition to
11 meeting UGI Gas’s specific data requirements. Obtaining the necessary qualification data
12 added another layer of complexity because customers were required to complete two
13 distinct applications to be eligible for both programs. To address these issues, the CSP
14 ultimately leveraged the UGI Gas technician’s scheduled appointments as leads to identify
15 customers who might qualify for Act 129. In Phase V, the Company will continue to meet
16 and collaborate with UGI Gas, as well as other potential collaboration partners, on
17 identifying barriers to coordination and improving collaboration opportunities throughout
18 Phase V and report out on collaboration efforts through the stakeholder meeting process.
19 In addition, I note that UGI Gas is not a party to this proceeding. I am advised by counsel
20 that requiring UGI Gas to take specific actions in this proceeding to change the
21 administration of its EE&C programs, as recommended by Mr. Grevatt, would deny UGI
22 Gas due process.

1 **Q. Does Mr. Grevatt have any further recommendations related to program**
2 **coordination?**

3 A. Yes. Mr. Grevatt also recommends that PPL Electric overhaul its process for partnering
4 with other organizations and “[a]t a minimum,” PPL Electric should: (1) “Establish formal
5 referral protocols”; (2) “Develop data-sharing agreements”; (3) “Define clear scopes of
6 work and sequencing standards”; (4) “Create a process flow chart”; (5) “Develop and
7 implement data tracking tool and protocols”; (7) “Dedicate staff capacity and
8 administrative resources”; (8) “Establish a rhythm for project coordination check-ins”; and
9 (9) “Report regularly on coordination outcomes.” (CAUSE-PA St. No. 1, pp. 47-48.)
10

11 **Q. Do you agree with this recommendation?**

12 A. No. Mr. Grevatt provides no analysis to support his recommendation. He does not provide
13 any information about the cost of his recommendation, the impact on program acquisition
14 cost, the impact on savings, or the impact on program cost-effectiveness. See PPL Electric
15 Exhibit TM-1R [PPL to CAUSE-I-2].) While the Company will continue improving and
16 enhancing coordination in Phase V, the administrative burden posed by Mr. Grevatt’s
17 highly prescriptive recommendations will increase costs, reduce program efficiency, and
18 potentially lower overall participation. PPL Electric has extensive experience coordinating
19 with other organizations to implement energy efficiency programs. PPL Electric believes
20 that its current coordination methods are sufficient to deliver effective programs to the
21 community it serves, including by providing referrals to all participants for external
22 agencies and organizations for which the customer may be eligible.

1 Implementing a highly structured coordination plan that would work for all the
2 varied organizations the Company works with to deliver EE&C programming would be
3 expensive and time-consuming. Mr. Grevatt also provides no evidence that his proposal is
4 feasible or effective or would result in the improved customer experiences he promotes. In
5 fact, administering sophisticated EE&C programming to multiple customer sectors while
6 partnering with many community organizations requires flexibility. I do not agree that
7 imposing an overarching, rigid structure would benefit customers or the Company's trade
8 allies or streamline PPL Electric's ability to administer its EE&C programs.

9
10 **Q. KEEA recommends that the Company work with the other Act 129 EDCs to create a**
11 **unified marketing website that would work as a single entry point for all the Act 129**
12 **programs. (KEEA St. No. 1, p. 16.) Please respond to this sweeping proposal.**

13 A. I disagree with this proposal and do not think it offers a practical solution for customers
14 seeking information about energy efficiency options for their households. Importantly,
15 EDC EE&C Plans were not highly coordinated by design, as each EDC serves different
16 customers across various geographical locations, and each Act 129 Plan features varied
17 program and measure offerings. A single point of entry would be an additional,
18 unnecessary step for customers to take, as the Company's customers will not be eligible
19 for offerings in a neighboring territory. This proposal could create significant customer
20 confusion, reduced customer satisfaction if customers are exposed to measures for which
21 they are ineligible, and potentially create customer complaints around differing incentive
22 levels. Further, this proposal contemplates a significant overhaul of how Act 129 plans are
23 designed and marketed to customers, which is more appropriately raised to the Commission

1 in the planning stage for Act 129 phases. Expecting PPL Electric to implement this change
2 in its Phase V proceeding, without any other EDC participation or feedback, is simply not
3 workable. If a unified marketing platform is launched in Pennsylvania regarding energy
4 efficiency programs, the Commission is the appropriate entity to coordinate those efforts,
5 not PPL Electric or the other EDCs. KEEA is making proposals in this PPL Electric-
6 specific proceeding that would affect all of the Act 129 EDCs. Because all of the Act 129
7 EDCs are not parties to this proceeding, I am advised by counsel that the consideration and
8 adoption of KEEA's proposals would deny those EDCs due process.

9
10 **V. MISCELLANEOUS**

11 **Q. KEEA also recommends that the Company conduct a survey to track awareness of**
12 **the Company's EE&C programs and to publicly report the findings of the survey.**
13 **(KEEA St. No. 1, p. 4.) Please respond to this recommendation.**

14 **A.** The Company completed extensive research prior to the development of the Company's
15 EE&C Plan, which included customer surveys related to program awareness. The
16 Company also surveyed customers as part of the evaluation process in Phase IV which
17 included an assessment of program familiarity and awareness as described. If the Company
18 chooses to do so in Phase V, the results will be available as part of the annual report process.

19
20 **Q. Do you agree with KEEA's recommendation for the Company to "expand the**
21 **enhanced trade ally network component to include training on heat pump water**

1 **heater technology and identify contractors as specialized installers of this important**
2 **technology.” (KEEA St. No. 1, p. 20.)**

3 A. Yes, the Company will include heat pump water heater (HPWH) technology as part of the
4 overall enhanced trade ally approach in Phase V. Trade allies participating in the program
5 will be provided with additional information and high-quality installation requirements for
6 HPWH technology

7
8 **Q. Do you agree with KEEA’s recommendation that the Company “[m]ake efficient heat**
9 **pump and heat pump water heater (‘HPWH’) incentives available to customers**
10 **regardless of the fuel used for space and water heating prior to the purchase of the**
11 **new high efficiency equipment”? (KEEA St. No. 1, p. 4.)**

12 A. No. Providing incentives for fuel switching is not allowable in Act 129. In the Phase V
13 Implementation Order, the Commission notes “programming that encourages customers to
14 replace fossil fuel equipment with electric equipment runs counter to the objectives of the
15 Act and should not be included in Phase V EE&C Plans.” (*See Final Implementation*
16 *Order*, p. 56.)

17
18 **Q. Please respond to OSBA witness Kaufman’s recommendation for the Company to**
19 **“clarify whether, and how, it plans to offer education, communication, and outreach**
20 **efforts around its *existing* [time of use (“TOU”)] program before the Commission**
21 **approves the Plan.” (OSBA St. No. 2, pp. 6-7.)**

1 A. To clarify, while the Company has an existing TOU program in its tariff with participating
2 customers, the Company's Phase V Plan does not include any incentives for TOU or
3 specific TOU programming at this time.

4
5 **Q. SEF witness Costlow recommends that PPL Electric overhaul its rebate structure to**
6 **offer rebates based on volumetric consumption levels. Do you agree with this**
7 **recommendation?**

8 A. No. This recommendation would create a usage-qualification requirement, making
9 incentive values unclear, difficult to market, and create significant delays in rebate
10 processing. Requiring customers to usage-qualify before submitting an application would
11 likely cause confusions and program attrition and represents an unnecessary administrative
12 burden that incentivizes higher usage. Such a change would also represent a major
13 overhaul of the Company's Plan and require significant analysis of the potential impacts
14 and the Company's ability to meet compliance targets. Mr. Costlow has not provided any
15 analysis of how this recommendation would impact savings or participation, nor has he
16 identified any notable potential benefits to the recommendation. The Company is strongly
17 opposed to any such recommendation.

18
19 **Q. SEF witness Costlow states that he is concerned that the Company's All Electric**
20 **Home program component "is a load-building program for PPL Electric and should**
21 **be paid for out of shareholder funds, not funds provided by ratepayers." (SEF St.**
22 **No. 1, p. 5.) Do you share this concern?**

1 A. No. The Company has created an electric home tier within the New Construction
2 component of the Residential Energy Efficiency Program. This anticipates that builders
3 may choose to build all-electric homes based on customer preference for clean energy and
4 the benefits of heat pump heating technology. Providing an appropriate incentive to ensure
5 these all electric homes are as efficient as possible, including heat pump water heater
6 technology in place of standard electric water heaters, will reduce load, not increase it.

7
8 **Q. SEF witness Costlow also raises consumer protection concerns with the Company's**
9 **proposed third-party financing offering. (SEF St. No. 1, pp. 6-7.) Please respond.**

10 A. The Company's financing offering is designed to connect customers to available funding
11 for which they may be qualified as a referral service, not to provide underwriting,
12 protections, loans, loan servicing, or other associated responsibilities. The Company and
13 the Company's implementation CSP will partner with National Energy Improvement Fund
14 ("NEIF"), a respected and experienced financing organization, to provide this service.
15 Customers will be able to select or decline available options based on their loan
16 qualifications and individual needs. Existing consumer protections both at the state and
17 federal level already provide protection for customers that may elect this offering. PPL
18 Electric is not in a position to provide additional consumer protections or oversee
19 specialized financing services. The Company is not providing financing directly and is
20 merely making customers aware of a potential financing option to reduce financial barriers
21 for moderate income customers.

1 **Q. Please address SEF witness Costlow’s recommendations related to interest buy downs**
2 **and working with the National Energy Improvement Fund to structure the offering**
3 **for all ratepayers.**

4 A. The Company agrees, in part, and plans to work with the National Energy Improvement
5 Fund to develop the financing structure for customers and will evaluate options that may
6 increase participation if it deems it appropriate. This includes reviewing costs and rate
7 recommendations from NEIF. The Company remains committed to providing this
8 financing option exclusively to moderate income customers in Phase V, a customer
9 segment with historically lower participation than other income levels.

10
11 **Q. Does this conclude your rebuttal testimony?**

12 A. Yes, it does.

PPL ELECTRIC EXHIBIT TM-1R

Petition of PPL Electric Utilities Corporation for Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan, Docket No. M-2025-3057329

Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania Responses to PPL Electric Utilities Corporation Interrogatories and Requests for Production of Documents, Set I

PPL to CAUSE-I-2.

Re: CAUSE-PA Statement No. 1. For each recommendation made in CAUSE-PA Statement No. 1:

- (a) Please explain whether Mr. Grevatt has studied or evaluated his recommendation's impact on:**
 - (1) The individual programs' cost-effectiveness;**
 - (2) The overall portfolio's cost-effectiveness;**
 - (3) The savings for all customer sectors and programs; and**
 - (4) The costs for all sectors and programs.**
 - (5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Mr. Grevatt relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).**
- (b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.**
- (c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.**
- (d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.**
- (e) Please provide all documents, reports, and workpapers relied upon by Mr. Grevatt in providing the information requested in subparts (c) and (d) above.**

CAUSE-PA Response:

(a)(1)-(4): Mr. Grevatt has not conducted these analyses.

(a)(5): N/A

(b): Please refer to CAUSE-PA Response to subpart (a). Mr. Grevatt notes the Company forecasts it will finish Phase IV with over \$27 million of its approved budgets unspent [see PPL's response to CAUSE-PA Set 1 No. 036] which suggests there may be similarly available funds in Phase V.

(c): N/A

**Petition of PPL Electric Utilities Corporation for Approval of its Act 129 Phase V Energy
Efficiency and Conservation Plan, Docket No. M-2025-3057329**

**Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania Responses
to PPL Electric Utilities Corporation Interrogatories and Requests for Production
of Documents, Set I**

(d): N/A

(e): N/A

Response prepared by or under the supervision of Jim Grevatt, CAUSE-PA Witness

Dated: January 27, 2025

Petition of PPL Electric Utilities Corporation for Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan, Docket No. M-2025-3057329

Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania Responses to PPL Electric Utilities Corporation Interrogatories and Requests for Production of Documents, Set I

PPL to CAUSE-I-3.

Re: CAUSE-PA Statement No. 1, p. 8. Regarding the recommendation that PPL Electric modify the forecast measure mix for the Resource-Constrained program such that building insulation and air sealing and efficient heat pumps and heat pump water heaters in aggregate comprise no less than 25% of the low-income portfolio savings for Phase V.

- (a) Do any of the other Pennsylvania Act 129 EDCs' proposed Phase V low-income EE&C programs meet the 25% threshold recommended by Mr. Grevatt? If so, please identify each EDC program that meets the demands of this recommendation.**
- (b) Do any of the other Pennsylvania Act 129 EDCs' Phase IV low-income EE&C programs meet the 25% threshold recommended by Mr. Grevatt? If so, please identify each EDC program that meets the demands of this recommendation.**
- (c) Please provide all documents, reports, and workpapers relied upon by Mr. Grevatt in providing the information requested in subparts (a) and (b) above.**

CAUSE-PA Response:

- (a)** Duquesne Light Company's Plan, as-filed, forecasts that nearly 21% of its low-income savings will come from heat pumps, heat pump water heaters, and building insulation and air sealing measures.
- (b)** Based on the data that were available in each of the EDC's filed Plans Mr. Grevatt prepared the figure included in his direct testimony labeled as Figure 4 on p. 33. None of the EDCs proposed to achieve 25% of its low-income savings from the comprehensive measures referenced by Mr. Grevatt.
- (c)** The documents and reports relied upon by Mr. Grevatt are cited in CAUSE-PA Statement 1. Links to any documents, reports, or other sources relied upon are provided in the footnotes of the testimony. For workpapers, please see response to PPL to CAUSE-I-1.

Response prepared by or under the supervision of Jim Grevatt, CAUSE-PA Witness

Dated: January 27, 2025

PPL TO OSBA-I-2

(Reference: OSBA Statement No. 1): For each recommendation made in OSBA Statement No. 1:

- (a) Please explain whether Ms. Vitulli has studied or evaluated the recommendation's impact on:
 - (1) The individual programs' cost-effectiveness;
 - (2) The overall portfolio's cost-effectiveness;
 - (3) The savings for all customer sectors and programs; and
 - (4) The costs for all sectors and programs.
 - (5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Ms. Vitulli relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).
- (b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.
- (c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.
- (d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.
- (e) Please provide all documents, reports, and workpapers relied upon by Ms. Vitulli in providing the information requested in subparts (c) and (d) above.

OSBA RESPONSE:

Below, I restate each of my recommendations in *OSBA Statement No. 1* and respond to PPL's interrogatories in turn.

Recommendation 1: "The Commission should require that PPL adjust its energy savings projections for the Small C&I sector to align with the *2025 Pennsylvania Energy Efficiency and Peak Demand Reduction Market Potential Study*, and correct overreliance on lighting measures. At present:

- The Company's lighting-related energy savings projections for this sector are 1.5 times greater than the Potential Study's estimated remaining savings potential for the Small C&I sector in PPL's service area.

- Lighting measures account for 56 percent of PPL’s total energy savings for the Small C&I sector.

As such, Small C&I projected savings do not seem feasible.”

- (a) PPL has proposed a plan in which (1) lighting measures account for more than half of total projected Small C&I energy savings, and (2) the Company’s projected energy savings from lighting measures from Small C&I far exceed the remaining savings potential estimated in the Commission’s Market Potential Study. As such, PPL’s expectations for Small C&I energy savings appear to be mathematically impossible.

To correct this discrepancy, PPL must revise the selection and/or quantity of Small C&I measures offered in Phase V. These adjustments may impact cost-effectiveness for the Small C&I sector and overall portfolio’s cost-effectiveness positively or negatively, depending on the measures that PPL substitutes. Weatherization measures, for example, are often very cost-effective. It is not within my scope as an expert witness to propose the details of a specific redesign of the Small C&I program, complete with cost-effectiveness testing. It is the utility’s job to propose a mathematically feasible plan that can be accomplished cost-effectively. As such, I cannot comment on how a change may affect cost-effectiveness within and outside of the Small C&I sector.

- (1) See (a) above.
 - (2) See (a) above.
 - (3) See (a) above.
 - (4) See (a) above.
 - (5) Not applicable.
- (b) This recommendation would have no impact on PPL’s overall budget for Phase V.
 - (c) Not applicable.
 - (d) Not applicable.
 - (e) Not applicable.

Recommendation 2: “The Commission should require PPL to revise the portfolio-wide budget for Upstream/Midstream incentives such that the Small C&I sector does not bear a disproportionate cost. Alternatively, the Commission should

require PPL to demonstrate that, under the Phase IV Plan, Small C&I customers benefitted from Upstream/Midstream incentives proportional to the Small C&I budget allocated to it.”

(a) I withdraw this recommendation.

Recommendation 3: “The Commission should require that PPL provide aggregated program- and sector-level participation targets in its Phase V Plan.”

- (a) This recommendation has no impact on the Phase V budget or cost-effectiveness.
- (b) Not applicable.
- (c) Not applicable.
- (d) Not applicable.
- (e) Not applicable.

Recommendation 4: “The Commission should require that PPL track the number of small business participants in the Company’s EE&C programming and include that figure in its annual reports.”

- (a) This recommendation has no impact on the Phase V budget or cost-effectiveness.
- (b) Not applicable.
- (c) Not applicable.
- (d) Not applicable.
- (e) Not applicable.

Recommendation 5: “The Commission should require that PPL prepare a more detailed plan and budget estimate for cross-coordination and braided funding with other conservation programs.”

- (a) I have not studied the impact of this recommendation on cost-effectiveness. Cross-coordination of funding would require minimal funding allocation relative to other Plan costs.
- (b) Not applicable.
- (c) Not applicable.
- (d) Not applicable.
- (e) Not applicable.

Recommendation 6: “The Commission should require that PPL disaggregate process evaluation results for the Non-Residential Program by customer sector, showing breakouts for Small C&I and Large C&I.”

(a) This recommendation concerns PPL’s method for reporting evaluation results and would have no impact on individual programs’ cost-effectiveness, the overall portfolio’s cost-effectiveness, the savings for all customer sectors and programs, or the costs for all customer sectors and programs.

(1) See (a) above.

(2) See (a) above.

(3) See (a) above.

(4) See (a) above.

(5) Not applicable.

(b) This recommendation simply requests that PPL report process evaluation results by customer sector, which requires no change to the existing EM&V budget. Presumably, the Company is already aware of the customer sector of its interviewees and survey respondents. If not, the Company simply needs to collect this information at the time of the interview/survey moving forward.

(c) Not applicable.

(d) Not applicable.

(e) Not applicable.

PPL TO OSBA-I-3

(Reference: OSBA Statement No. 1): For the recommendation to revise upstream/midstream incentive budgets made in OSBA Statement No. 1:

(a) Please explain how the Small C&I sector would bear a disproportionate cost, considering actual costs are assigned to the sector only when benefits are confirmed.

(b) Please explain if Ms. Vitulli has examined the balance of downstream and midstream budget allocation as part of this analysis, as well as the overall increase in Small C&I sector participation in Phase IV when making the stated assumptions.

OSBA RESPONSE:

I withdraw this recommendation.

- Exhibit IEc-2-12 – https://www.iepec.org/wp-content/uploads/2025/09/Nilsson_Dana.pdf

PPL TO OSBA-I-5

(Reference: OSBA Statement No. 2): For each recommendation made in OSBA Statement No. 2:

- (a) Please explain whether Mr. Kaufman has studied or evaluated his recommendation's impact on:
 - (1) The individual programs' cost-effectiveness;
 - (2) The overall portfolio's cost-effectiveness;
 - (3) The savings for all customer sectors and programs; and
 - (4) The costs for all sectors and programs.
- (5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Mr. Kaufman relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).
- (b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.
- (c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.
- (d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.
- (e) Please provide all documents, reports, and workpapers relied upon by Mr. Kaufman in providing the information requested in subparts (c) and (d) above.

OSBA RESPONSE:

Below, I restate each of my recommendations in OSBA Statement No. 2 and respond to PPL's interrogatories in turn.

Recommendation 1: "PPL will revise the design of its proposed Peak Load Shift Pilot to increase opportunities for success and SC&I participation. I provide specific recommendations in Section 2 of my testimony." The specific recommendations in Section 2 of my testimony include:

- "To enhance participation opportunities for SC&I customers, I recommend conducting an evaluation of the pilot no later than 12 months after the start date."

- “As I discuss below, I also recommend that PPL conduct quarterly reviews of the pilot to support continuous learning and improvement.” *Please see Recommendation 2, below.*
 - “I recommend recruiting a larger number of SC&I participants for the initial pilot, if possible given funding limitations.”
- (a) My recommendation to **conduct an evaluation of the pilot no later than 12 months after the start date** would shift the *timing* of planned expenditures, but it would not change the *amount* of the expenditures. Specifically, PPL’s Plan states that the Peak Load Shift Pilot will run between 12 to 24 months. “At the conclusion of the pilot,” evaluation results will be included in the annual reporting process.¹ If the pilot were to run 24 months, my recommendation would shift the evaluation from month 24 to month 12. The shift in timing would not change the cost of the evaluation. If the evaluation identifies areas of the program that need improvement, PPL will have one year to improve the program before the pilot is completed. Implementing any such improvements could, in turn, improve the program’s savings and cost-effectiveness. However, I am unable to quantify the potential impacts that might result from future evaluation findings.

My recommendation to **recruit a larger number of SC&I participants for the initial pilot, if possible given funding limitations** would expand participation opportunities to additional businesses, provide more data points to evaluate the results of the pilot, and hedge against possible attrition from the pilot. As indicated in my recommendation, recruiting additional participants would require additional funding. Additional participation in the pilot could also result in additional savings. I have not evaluated the impact on the individual program’s cost-effectiveness, the overall portfolio’s cost-effectiveness, the savings for all customer sectors and programs, or the costs for all sectors and programs.

- (1) See above.
- (2) See above.
- (3) See above.
- (4) See above.
- (5) Not applicable; see above.

¹ PPL Phase V EE&C Plan, page 190.

- (b) I have not evaluated where the dollars in the budget for the Phase V EE&C Plan would come from to recruit a larger number of SC&I participants for the initial pilot.

I note that PPL projects over \$27 million of the Company's Phase IV EE&C Plan budget will remain unspent by the end of Phase IV: \$5 million for Residential, \$4.4 million for Low Income, \$11.3 million for Small C&I, and \$6.5 million for Large C&I.² If the Company performs similarly in Phase V, the dollars could come from the unspent portion of the budget.

Conducting an evaluation of the pilot no later than 12 months after the start date would not require additional dollars, as discussed in my response (a), above.

- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

Recommendation 2: "PPL will conduct quarterly reviews throughout the Peak Load Shift Pilot to support timely analysis and course correction."

- (a) I expect the reviews could improve the savings and cost-effectiveness of the Peak Load Shift pilot by ensuring that any problems are identified and mitigated early on. I have not priced out the quarterly reviews, but I expect they would entail a modest incremental cost beyond what the Company has already committed to doing. As stated in PPL's Phase V EE&C Plan: "PPL Electric Utilities is involved at every level of program implementation and evaluation, closely monitoring all financials, energy savings, participation, satisfaction, and performance. Daily, weekly, and monthly status updates, supported by robust CSP [Conservation Service Provider] reporting and dashboards, will allow the Company to have real-time insight into program performance in a way that allows us to be proactive and make key decisions to avoid potential issues with compliance with Act 129. The Company also utilizes sophisticated modeling and forecasting approaches separate from our CSPs, which provide verification of progress and early warning capabilities."³ The reviews would involve

² PPL Electric Utilities Corporation Response to the Set I Data Requests of the Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA) Dated December 2, 2025, CAUSE-PA I-36.

³ PPL Phase V EE&C Plan, page 194.

using the data referenced in the Company's Plan for continuous learning and improvement throughout the Peak Load Shift pilot.

- (1) See above.
- (2) See above.
- (3) See above.
- (4) See above.
- (5) Not applicable; see above.
- (b) I have not evaluated where the dollars in the budget for the Phase V EE&C Plan would come from to conduct the reviews.
- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

Recommendation 3: "PPL will not provide incentives to participants that use diesel and other fossil fuel backup generators during demand response events."

- (a) This recommendation would ensure that Act 129 resources are not used to incentivize diesel and other fossil fuel generators, which create significant local air pollution and have negative environmental impacts. I do not anticipate this recommendation having an effect on cost-effectiveness or savings. Any incentives that would otherwise have gone to customers using diesel/fossil fuel backup generators would instead go to customers not using diesel/fossil fuel backup generators; the total amount of incentives would not change.
 - (1) See above.
 - (2) See above.
 - (3) See above.
 - (4) See above.
 - (5) Not applicable; see above.
- (b) This recommendation would not require additional dollars.
- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

Recommendation 4: “PPL will clarify its plans for offering time of use (TOU) incentives and associated education, communication, and outreach efforts.”

- (a) This recommendation simply asks the Company to clarify its plans; it does not affect savings or cost-effectiveness.
 - (1) See above.
 - (2) See above.
 - (3) See above.
 - (4) See above.
 - (5) Not applicable; see above.
- (b) This recommendation would not require additional dollars.
- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

Recommendation 5: “PPL will provide evidence that its Solar PV and CHP targets are achievable by addressing the uncertainties raised in Section 3 of my testimony.”

- (a) This recommendation requests additional evidence to substantiate the existing projections in the Company’s Plan; it does not affect savings or cost-effectiveness.
 - (1) See above.
 - (2) See above.
 - (3) See above.
 - (4) See above.
 - (5) Not applicable; see above.
- (b) This recommendation would not require additional dollars.
- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

Recommendation 6: “PPL will include a formal “go/no go” decision in its Conservation Voltage Reduction (CVR) Pilot and specify a spending cap for reaching this decision.”

- (a) This recommendation requests adding a formal “go/no go” decision to the CVR Pilot that the Company has already included in its Plan. This recommendation would not directly affect cost-effectiveness or savings. However, it could indirectly improve cost-effectiveness by ensuring that the CVR pilot proceeds only if the Company’s initial research shows that it is feasible to implement a CVR program in line with Act 129.
 - (1) See above.
 - (2) See above.
 - (3) See above.
 - (4) See above.
 - (5) Not applicable; see above.
- (b) This recommendation would not require additional dollars.
- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

Recommendation 7: “PPL will assign benefits and costs from the CVR Pilot to the correct rate class(es), consistent with standard practices.”

- (a) This recommendation would not change savings or cost-effectiveness; it would simply ensure that any savings and costs are assigned to the appropriate customer class(es).
 - (1) See above.
 - (2) See above.
 - (3) See above.
 - (4) See above.

- (5) Not applicable; see above.
- (b) This recommendation would not require additional dollars.
- (c) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (d) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.
- (e) I am not recommending the addition of a new measure, program, or pilot program, so this is not applicable.

PPL to OCA-I-2

Re: OCA Statement No. 1. For each recommendation made in OCA Statement No. 1:

- (a) Please explain whether Ms. Sherwood has studied or evaluated her recommendation's impact on:
 - (1) The individual programs' cost-effectiveness;
 - (2) The overall portfolio's cost-effectiveness;
 - (3) The savings for all customer sectors and programs; and
 - (4) The costs for all sectors and programs.
 - (5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Ms. Sherwood relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).
- (b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.
- (c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.
- (d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.
- (e) Please provide all documents, reports, and workpapers relied upon by Ms. Sherwood in providing the information requested in subparts (c) and (d) above.

OCA Response:

- (a) The following response is applicable to each of Ms. Sherwood's program recommendations: Ms. Sherwood was not retained to design the Company's energy efficiency portfolio. Rather, she brings extensive experience and subject-matter expertise derived from advising on and observing successful energy efficiency measures and program implementations across multiple jurisdictions. Drawing on these best practices, Ms. Sherwood offered recommendations in her direct testimony. Ms. Sherwood did not conduct a cost-effectiveness analysis of individual programs or of the portfolio as a whole, nor did she study or evaluate the savings and costs across all programs and customer sectors.

- (b) Residential lighting recommendation – This recommendation does not increase program spending. Rather, it proposes reallocating the existing budget designated for residential lighting to comprehensive weatherization measures.

Commercial Lighting recommendation – This recommendation does not increase program spending. It proposes reducing funding for C&I lighting over Phase V and reallocating those funds to measures that provide longer-lived savings.

HER Program recommendation – This recommendation requires reallocating funding from the HER program to the REEP and RCEEP programs, based on allocation decisions. The reallocated funds are intended to support weatherization and HVAC measures.

School Energy Education Program recommendation – This recommendation involves removing funding for educational kits and reallocating those funds toward audits, weatherization, and HVAC measures.

Incentive Ranges recommendation – This recommendation does not involve any budgetary changes.

Interconnection Process recommendation – This recommendation is an internal education effort, which may include some marketing activities to raise program awareness. Any associated costs should be covered by the marketing budget already proposed by the Company in the Plan.

- (c) The criteria are not applicable to any of the recommendations in Ms. Sherwood's testimony.
- (d) The criteria are not applicable to any of the recommendations in Ms. Sherwood's testimony.
- (e) Not applicable.

Responding Witness: Stacy L. Sherwood
Response Date: January 26, 2026

**PETITION OF PPL ELECTRIC UTILITIES CORPORATION FOR APPROVAL OF
ITS ACT 129 PHASE V ENERGY EFFICIENCY AND CONSERVATION PLAN;
DOCKET NO. M-2025-3057329**

**THE SUSTAINABLE ENERGY FUND'S RESPONSES TO PPL ELECTRIC UTILITIES
CORPORATION'S INTERROGATORIES AND REQUESTS FOR PRODUCTION OF
DOCUMENTS – SET I**

PPL to SEF-I-2

Re: SEF Statement No. 1. For each recommendation made in SEF Statement No. 1:

- (a) Please explain whether Mr. Costlow has studied or evaluated his recommendation's impact on:
 - (1) The individual programs' cost-effectiveness;
 - (2) The overall portfolio's cost-effectiveness;
 - (3) The savings for all customer sectors and programs; and
 - (4) The costs for all sectors and programs.
 - (5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Mr. Costlow relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).
- (b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.
- (c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.
- (d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.
- (e) Please provide all documents, reports, and workpapers relied upon by Mr. Costlow in providing the information requested in subparts (c) and (d) above.

RESPONSE:

- (a) Not applicable.
- (b) Not applicable.

**PETITION OF PPL ELECTRIC UTILITIES CORPORATION FOR APPROVAL OF
ITS ACT 129 PHASE V ENERGY EFFICIENCY AND CONSERVATION PLAN;
DOCKET NO. M-2025-3057329**

**THE SUSTAINABLE ENERGY FUND'S RESPONSES TO PPL ELECTRIC UTILITIES
CORPORATION'S INTERROGATORIES AND REQUESTS FOR PRODUCTION OF
DOCUMENTS – SET I**

(c) Not applicable.

(d) Not applicable.

(e) Not applicable.

PROVIDED BY: John Costlow

DATE: January 26, 2026

**Response of Keystone Energy Efficiency Alliance
to the Interrogatories of PPL, Set I
Docket No. M-2025-3057329**

PPL to KEEA-I-2:

Re: KEEA Statement No. 1. For each recommendation made in KEEA Statement No. 1 aside from the recommended increase to the Health & Safety budget:

- a) Please explain whether Ms. Zappa has studied or evaluated the recommendation's impact on:
 - 1) The individual programs' cost-effectiveness;
 - 2) The overall portfolio's cost-effectiveness;
 - 3) The savings for all customer sectors and programs; and
 - 4) The costs for all sectors and programs.
- 5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Ms. Zappa relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).
- b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.
- c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.
- d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.
- e) Please provide all documents, reports, and workpapers relied upon by Ms. Zappa in providing the information requested in subparts (c) and (d) above.

Response:

Please see Attachment PPL-KEEA-I-2.

Response provided by: Jeaneen Zappa

Dated: January 26, 2026

Response of Keystone Energy Efficiency Alliance
to the Interrogatories of PPL, Set I
Docket No. M-2025-3057329
Attachment PPL-KEEA-I-2

Recommendation	a) Please explain whether Ms. Zappa has studied or evaluated the recommendation's impact on:					b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.	c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.	d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.	e) Please provide all documents, reports, and workpapers relied upon by Ms. Zappa in providing the information requested in subparts (c) and (d) above.
	1) The individual programs' cost-effectiveness;	2) The overall portfolio's cost-effectiveness;	3) The savings for all customer sectors and programs; and	4) The costs for all sectors and programs.	5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Ms. Zappa relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).				
2. Include an assessment in its low income program that aligns with the Healthy Home Evaluator evaluations from the Building Performance Institute and adopt the Healthy Home Evaluator certification as a requirement for contractors;	I have not performed this analysis.	I have not performed this analysis.	I have not performed this analysis.	I have not performed this analysis.	Not applicable	Residential Low Income administration and contractor funds	Since we are not aware of the current costs to deliver the energy assessments, we cannot provide a clear incremental cost. For programs that are already conducting an in-home energy audit, conducting the healthy home evaluation should add a minimal amount of additional time to assess the additional measures. These can also be added to the virtual energy audit programs favored by some utilities. Green & Healthy Homes Initiative provides for free an entire toolkit for making virtual healthy home assessments, which they developed during the COVID-19 pandemic. (see https://www.greenandhealthyhomes.org/product/virtual-healthy-home-assessment-protocol/)	I have not performed that analysis	1. National Center for Healthy Housing 2025 Healthy Housing Fact Sheet, National Center for Healthy Housing, https://nchh.org/resource-library/fact-sheet_state-healthy-housing_usa.pdf 2. National Center for Healthy Housing 2025 Federal Agency Fact sheets, https://nchh.org/resource/fact-sheet_healthy-housing-agency_2025-bundle/ 3. Non-Energy Benefit Assessment Practices for Housing Interventions: Guidance for Weatherization and Energy Efficiency Programs, https://www.greenandhealthyhomes.org/wp-content/uploads/assessing_NEBs_FEWw-programs.pdf 4. Reimbursement Strategies for Healthy Homes Services Issue Brief: Considerations for State Medicaid Offices - Green & Healthy Homes Initiative, https://www.greenandhealthyhomes.org/wp-content/uploads/GHHI-State-Medicaid-Reimbursement-11.10.22.pdf 5. Integrating Health-Related Services into Electrification Upgrades: Feasibility Study for BloPower, Green & Healthy Homes Initiative, https://www.greenandhealthyhomes.org/wp-content/uploads/GHHI_Feasibility_Study_BloPower_June_2023.pdf 6. HOSPITAL-LED PROGRAMS THAT IMPROVE HOUSING QUALITY - Green & Healthy Homes Initiative, https://www.greenandhealthyhomes.org/wp-content/uploads/GHHI-Hospital-Home-Repair-v1.pdf 7. Energy Insecurity, Energy Justice & Equity Measurements.Low-Income Weatherization & Energy Efficiency Programming National & Maryland Policies, https://www.greenandhealthyhomes.org/wp-content/uploads/Harris-MHS-Essay.pdf 8. American Council for an Energy Efficiency Economy blog post, "Healthy Homes for All: the Untapped Power of Energy Efficiency Programs," https://www.aceee.org/blog-post/2020/05/healthy-homes-all-untapped-power-energy-efficiency-programs 9. A Systematic Review of Housing Interventions and Health Introduction, Methods, and Summary Findings https://drive.google.com/drive/folders/1P6x8QuJ5vFUEvRjVN60Pvudw9tX5yXJ 10. HUD Healthy Homes Technical Studies Grant MDLH0135-05 December 21, 2006: Review of Assessment Methodologies Used in Ten Studies of the Home Environment of Asthmatic Children Final Report, http://nchharchive.org/LinkClick.aspx?fileticket=gGr1DNurMo4%3d&tabid=197 11. Weatherization + Health Health and Climate Change Co-Benefits of Home Weatherization in Vermont December 2018, https://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_CH_VxHealthReport.pdf
3. Align with the other Act 129 EDCs around developing and supporting a single point of entry for their Act 129 programs under a single umbrella label.	I have not performed this analysis. Presumably any extra coordination costs could be offset by reductions to marketing and outreach costv via sharing these costs with other utilities	I have not performed this analysis. Presumably any extra coordination costs could be offset by reductions to marketing and outreach costv via sharing these costs with other utilities	I have not performed this analysis. Presumably acquisition costs could come down, which would increase savings given fixed budgets	I have not performed this analysis. Presumably any extra coordination costs could be offset by reductions to marketing and outreach costv via sharing these costs with other utilities	Not applicable	Common Costs	Not applicable	Not applicable	1. Toolkit Shows How Energy Efficiency Programs Can Reach More Underserved Households November 30, 2023 https://www.aceee.org/blog-post/2023/11/toolkit-shows-how-energy-efficiency-programs-can-reach-more-underserved 2. Efficiency Reduces Energy Burdens for Low-Income Multifamily Households April 9, 2019, https://www.aceee.org/blog/2019/04/efficiency-reduces-energy-burdens-low 3. ACEEE TOOLKIT: Adapting Energy Efficiency Programs to Reach Underserved Residents NOVEMBER 2023, DIRECT QUOTE: "A significant barrier can be the low community trust of utilities and low awareness of available programs, especially among low- and moderate-income customers. A study by Uplight reported that 31% of low- and moderate-income customers did not think their utility would offer a service like bill payment assistance, and 50% of customers were unaware of utility energy efficiency offerings (Uplight 2023)." https://www.aceee.org/sites/default/files/pdfs/adapting_energy_efficiency_programs_to_reach_underserved_residents_-_enr.pdf
4. Include in their annual report the to the PUC a summary of their outreach activities to each sector (small business, commercial and industrial, residential, and low income);	I have not performed this analysis. Presumably PPL should already be tracking this, and reporting on it will have minimal extra costs.	I have not performed this analysis. Presumably PPL should already be tracking this, and reporting on it will have minimal extra costs.	Not applicable	I have not performed this analysis. Presumably PPL should already be tracking this, and reporting on it will have minimal extra costs.	Not applicable	Common Costs	Not applicable	Not applicable	Not applicable
5. Conduct a survey to track awareness of Act 129 programs and to publicly share the findings and use this information as a basis for further considering marketing coordination;	I have not performed this analysis. PPL could work with the other Act 129 EDCs to reduce the individual EDC Cost burden..	I have not performed this analysis. PPL could work with the other Act 129 EDCs to reduce the individual EDC Cost burden..	Not applicable	I have not performed this analysis. PPL could work with the other Act 129 EDCs to reduce the individual EDC Cost burden..	Not applicable	Common Costs	Not applicable	Not applicable	1. The Significance and Benefits of Awareness Surveys: https://gmo-research.ai/en/resources/articles/2024-articles-research-Significance-and-Benefits-of-Awareness-Surveys 2. Brand Awareness Survey: Benefits & 7 Best Practices in 2025 https://www.marketingcop.com/ai/brand-awareness-survey/#google_vignette
6. Coordinate with the Pennsylvania Department of Environmental Protection ("PA DEP") on exactly how incentive "braiding" will occur, including ways to streamline application processes and reduce duplicative data collection;	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	Not applicable	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	Not applicable	Common Costs	Not applicable	Not applicable	Not applicable

Recommendation	a) Please explain whether Ms. Zappa has studied or evaluated the recommendation's impact on:					b) Please identify where the dollars in the budget for the Phase V EE&C Plan will come from to implement this recommendation.	c) If the recommendation is the addition of a new measure, program, or pilot program, please provide its projected budget, participation level, and savings for each Program Year of Phase V.	d) If the recommendation is the addition of a new measure, program, or pilot program, please provide its TRC benefit-cost ratio.	e) Please provide all documents, reports, and workpapers relied upon by Ms. Zappa in providing the information requested in subparts (c) and (d) above.
	1) The individual programs' cost-effectiveness;	2) The overall portfolio's cost-effectiveness;	3) The savings for all customer sectors and programs; and	4) The costs for all sectors and programs.	5) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Ms. Zappa relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).				
7. Make efficient heat pump and heat pump water heater ("HPWH") incentives available to customers regardless of the fuel used for space and water heating prior to the purchase of the new high efficiency equipment;	It is not clear from PPL's filing whether these customers are eligible, so it is not possible to determine what effect this may have.	It is not clear from PPL's filing whether these customers are eligible, so it is not possible to determine what effect this may have.	It is not clear from PPL's filing whether these customers are eligible, so it is not possible to determine what effect this may have.	It is not clear from PPL's filing whether these customers are eligible, so it is not possible to determine what effect this may have.	Not applicable	Residential Program	Not applicable	Not applicable	Not applicable
8. Enter into a formal data sharing partnership between the PA DEP, Resource Innovations, EDCs and others to streamline data flow and expedite braided incentive processing, and provide the formal partnership plan to interveners in this docket;	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	Not applicable	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers. Energy Efficiency Alliance, the sister organization of my employer, KEEA, hosts a PA Contractor Network. Staff from DEP and Resource Innovations have appeared on multiple quarterly calls of the network to express their desire to align the programs. We have been informed by industry peers and DEP that a data sharing working group has been convened by DEP to include the EDCs to establish a data-sharing protocol. It would appear that these existing activities facilitate the recommended formal data sharing partnership.	Not applicable	Common Costs	Not applicable	Not applicable	Not applicable
9. Report on the results of this formal coordination plan in the semi-annual and annual reports to the PUC to include metrics on the number of coordinated projects by measure and additional funds leveraged due to coordination;	I have not performed this analysis. Presumably PPL should already be tracking this, and reporting on it will have minimal extra costs.	I have not performed this analysis. Presumably PPL should already be tracking this, and reporting on it will have minimal extra costs.	Not applicable	I have not performed this analysis. Presumably PPL should already be tracking this, and reporting on it will have minimal extra costs.	Not applicable	Common Costs	Not applicable	Not applicable	Not applicable
10. Cover any costs for ASHRAE Level 2 audits not covered by the HER program for participants in both programs;	I have not performed this analysis, but it appears that there are already some costs for this built in to PPL's Phase V Plan.	I have not performed this analysis, but it appears that there are already some costs for this built in to PPL's Phase V Plan.	I have not performed this analysis, but it appears that there are already some savings for this built in to PPL's Phase V Plan.	I have not performed this analysis, but it appears that there are already some costs for this built in to PPL's Phase V Plan.	PPL Phase V Plan.	I have not performed this analysis.	Not applicable	Not applicable	Not applicable
11. Expand the proposed enhanced trade ally network component beyond heat pumps, to include heat pump water heater technology training and trade ally inclusion;	I have not performed this analysis.	I have not performed this analysis.	Not applicable	I have not performed this analysis.	Not applicable	Common Costs	Not applicable	Not applicable	Not applicable
12. Coordinate with the other Act 129 EDCs and state programs, such as the PA DEP's HEAR and TREC, to combine resources to deliver workforce development training on the focus areas referenced above	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers.	Not applicable	I have not performed this analysis, however I anticipate that this could be achieved via existing staff resources with no extra costs to ratepayers. I serve on the state's advisory group regarding the Training for Residential Energy Contractors (TREC) program. Provided that the federal government releases the grant funds as anticipated, TREC coordination with the HEAR program should be fully aligned.	Not applicable	Common Costs	Not applicable	Not applicable	Not applicable

PPL ELECTRIC EXHIBIT TM-2R

Savings Projections

Table 9. Residential Estimated Savings and Participation

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
<i>Dehumidifier Retirement</i>	2.4.12	Energy Savings (MWh) ²	955	979	1,028	1,077	857	4,897
		Summer Demand Reduction (MW)	0.2	0.2	0.2	0.2	0.2	0.9
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	956	980	1,029	1,078	857	4,900
<i>Low-Capacity Refrigerator / Freezer Recycling without Replacement</i>	2.4.4	Energy Savings (MWh) ²	85	87	92	96	78	438
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	286	293	308	322	261	1,470
<i>Refrigerator / Freezer Recycling with and without Replacement</i>	2.4.3	Energy Savings (MWh) ²	19	20	20	22	17	98
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	24	25	26	28	22	125
<i>Room AC (RAC) Retirement</i>	2.2.8	Energy Savings (MWh) ²	51	52	54	57	45	260
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.4
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	390	400	420	440	350	2,000
<i>Low-Flow Faucet Aerators: Kit</i>	2.3.6	Energy Savings (MWh) ²	459	459	459	459	459	2,295
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3
		Winter Demand Reduction (MW)	0.1	0.2	0.2	0.2	0.2	1.0
		Projected Participation ³	29,162	29,162	29,162	29,162	29,162	145,810
	2.3.7	Energy Savings (MWh) ²	1,022	1,022	1,022	1,022	1,022	5,108

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
Low-Flow Showerheads: Kit		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.6
		Winter Demand Reduction (MW)	0.2	0.3	0.3	0.3	0.3	1.3
		Projected Participation ³	60,662	60,662	60,662	60,662	60,662	303,310
WH > 10% UBC \$0.30/kWh	2.7.1	Energy Savings (MWh) ²	3,200	3,170	3,192	3,216	3,246	16,024
		Summer Demand Reduction (MW)	1.1	1.1	1.1	1.1	1.1	5.5
		Winter Demand Reduction (MW)	0.7	0.7	0.7	0.7	0.7	3.3
		Projected Participation ³	1,600	1,585	1,596	1,608	1,623	8,012
WH > 10% UBC HPWH \$0.60/kWh	2.7.1	Energy Savings (MWh) ²	390	585	780	975	1,170	3,900
		Summer Demand Reduction (MW)	0.1	0.1	0.2	0.2	0.3	0.9
		Winter Demand Reduction (MW)	0.1	0.1	0.2	0.2	0.3	0.9
		Projected Participation ³	100	150	200	250	300	1,000
ENERGY STAR Certified Connected Thermostats	2.2.12	Energy Savings (MWh) ²	2,910	2,910	2,910	2,910	2,910	14,551
		Summer Demand Reduction (MW)	0.4	0.4	0.4	0.4	0.4	2.1
		Winter Demand Reduction (MW)	0.6	0.6	0.6	0.6	0.6	3.0
		Projected Participation ³	7,906	7,906	7,906	7,906	7,906	39,530
Residential LED Lighting: ENERGY STAR Screw-in LED Bulb (Standard)	2.1.1	Energy Savings (MWh) ²	556	534	491	454	400	2,435
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3
		Winter Demand Reduction (MW)	0.1	0.5	0.5	0.6	0.4	2.1
		Projected Participation ³	13,395	12,853	11,831	10,919	9,626	58,625
Residential LED Lighting: ENERGY STAR Screw-in LED Bulb (Decorative: non-globe (e.g., candelabra))	2.1.1	Energy Savings (MWh) ²	545	517	466	419	377	2,324
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3
		Winter Demand Reduction (MW)	0.1	0.2	0.2	0.2	0.2	0.9
		Projected Participation ³	16,712	15,877	14,290	12,862	11,576	71,317
	2.1.1	Energy Savings (MWh) ²	362	344	311	280	252	1,549

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
<i>Residential LED Lighting: ENERGY STAR Screw-in LED Bulb (Directional/Reflector)</i>		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.2
		Winter Demand Reduction (MW)	0.0	0.1	0.1	0.1	0.1	0.5
		Projected Participation ³	8,233	7,828	7,060	6,370	5,722	35,213
<i>LED and Electroluminescent Nightlights</i>	2.1.3	Energy Savings (MWh) ²	3	3	2	2	2	12
		Summer Demand Reduction (MW)	-	-	-	-	-	-
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	774	666	577	500	422	2,940
<i>Low-Flow Faucet Aerators: Direct install</i>	2.3.6	Energy Savings (MWh) ²	5	5	5	5	4	25
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.1	0.1	0.1	0.1	0.3
		Projected Participation ³	85	87	91	95	78	436
<i>Low-Flow Showerheads: Direct install</i>	2.3.7	Energy Savings (MWh) ²	7	6	5	5	4	27
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.2
		Projected Participation ³	102	90	83	75	62	413
<i>Thermostatic Shower Restriction Valves</i>	2.3.8	Energy Savings (MWh) ²	0	0	0	0	0	1
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	6	6	7	7	6	32
<i>Water Heater Tank Wrap</i>	2.3.3	Energy Savings (MWh) ²	0	0	0	0	0	1
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
	2.3.4	Energy Savings (MWh) ²	1	1	1	1	1	5

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
<i>Water Heater Temperature Setback</i>		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	13	13	13	13	13	65
<i>Advanced Power Strips</i>	2.5.1	Energy Savings (MWh) ²	4,756	4,580	4,404	4,404	4,404	22,549
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.6
		Winter Demand Reduction (MW)	0.2	0.2	0.2	0.2	0.2	0.8
		Projected Participation ³	54,135	52,135	50,136	50,136	50,134	256,676
<i>ENERGY STAR Air Purifiers - Direct Install LI & MF</i>	2.4.14	Energy Savings (MWh) ²	24	24	26	27	21	121
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.3	0.3	0.4	0.3	1.3
		Projected Participation ³	82	83	88	92	73	418
<i>LED Exit Signs</i>	3.1.4	Energy Savings (MWh) ²	3	4	4	4	3	18
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	12	13	13	14	11	63
<i>Lighting Retrofits - Other Interior Fixtures</i>	3.1.1	Energy Savings (MWh) ²	4	4	5	5	4	22
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	3.1	3.4	3.1	2.6	12.1
		Projected Participation ³	20	20	21	22	18	101
<i>Lighting Retrofits - Outdoor floods</i>	3.1.1	Energy Savings (MWh) ²	15	15	16	17	13	76
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	1.6	0.9	0.9	0.9	4.4
		Projected Participation ³	25	25	27	28	22	127
	3.1.1	Energy Savings (MWh) ²	6	6	6	7	5	29

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
<i>Lighting Retrofits - Parking Garage</i>		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	8	8	8	9	7	40
<i>Lighting Retrofits - Parking Lot</i>	3.1.1	Energy Savings (MWh) ²	16	16	17	18	14	82
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.1	0.0	0.2
		Projected Participation ³	25	25	27	28	22	127
<i>Lighting: Permanent Fixture Removal</i>	3.1.1	Energy Savings (MWh) ²	87	89	93	98	78	444
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Winter Demand Reduction (MW)	0.0	0.1	0.1	0.2	0.1	0.6
		Projected Participation ³	244	250	263	275	219	1,251
<i>Linear LED: Lamp Replacement</i>	3.1.1	Energy Savings (MWh) ²	12	12	13	14	11	62
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	366	375	394	413	328	1,876
<i>Linear LED: Retrofit Fixture, surface mount</i>	3.1.1	Energy Savings (MWh) ²	4	4	5	5	4	22
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	25	25	27	28	22	127
<i>Linear LED: Retrofit Fixture, troffer</i>	3.1.1	Energy Savings (MWh) ²	6	6	7	7	6	33
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	25	25	27	28	22	127
<i>Occupancy Sensor</i>	3.1.3	Energy Savings (MWh) ²	1	1	1	1	1	4

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	6	7	7	7	6	33
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	3,144	3,150	3,163	3,175	3,119	15,751
HVAC Systems: PTAC	2.2.1	Energy Savings (MWh) ²	0	0	0	0	0	2
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1	1	1	1	1	5
HVAC Systems: PTHP	2.2.1	Energy Savings (MWh) ²	14	14	14	14	14	70
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.2
		Projected Participation ³	4	4	4	4	4	20
Advanced Power Strips: Kit	2.5.1	Energy Savings (MWh) ²	1,488	1,488	1,488	1,488	1,488	7,440
		Summer Demand Reduction (MW)	0.2	0.2	0.2	0.2	0.2	0.9
		Winter Demand Reduction (MW)	0.2	0.5	0.5	0.5	0.5	2.3
		Projected Participation ³	20,001	20,001	20,001	20,001	20,001	100,005
Connected Smart Thermostat	LS002	Energy Savings (MWh) ²	-	-	-	-	-	-
		Summer Demand Reduction (MW)	0.8	0.8	0.9	0.9	1.0	4.5
		Winter Demand Reduction (MW)	1.7	2.0	2.1	2.2	2.4	10.5
		Projected Participation ³	17,955	19,209	20,539	21,983	23,522	103,208
Electric Vehicle Managed Charging (Actively Managed)	LS006	Energy Savings (MWh) ²	-	-	-	-	-	-
		Summer Demand Reduction (MW)	0.1	0.1	0.2	0.2	0.2	0.8

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	0.1	0.1	0.2	0.2	0.2	0.8
		Projected Participation ³	1,200	1,440	1,728	2,074	2,488	8,930
<i>Behind the Meter Battery Storage (Bring Your Own)</i>	LS012	Energy Savings (MWh) ²	-	-	-	-	-	-
		Summer Demand Reduction (MW)	0.3	0.3	0.4	0.4	0.5	1.9
		Winter Demand Reduction (MW)	0.3	0.3	0.4	0.4	0.5	1.9
		Projected Participation ³	500	575	661	760	875	3,371
<i>Water Heater Pipe Insulation</i>	2.3.5	Energy Savings (MWh) ²	47	47	47	47	47	237
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.2	0.2	0.2	0.2	0.7
		Projected Participation ³	112	112	112	112	112	560
<i>Smart Water Heater Controls</i>	2.3.10	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
<i>Weather Stripping, Caulking, and Outlet Gaskets: Outlet Gasket</i>	2.6.2	Energy Savings (MWh) ²	133	133	133	133	133	666
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.2
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	21,940	21,940	21,940	21,940	21,940	109,700
<i>Advanced Power Strips: Tier 1</i>	2.5.1	Energy Savings (MWh) ²	59	59	59	59	59	293
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	822	822	822	822	822	4,110
<i>Advanced Power Strips: Tier 2</i>	2.5.1	Energy Savings (MWh) ²	64	64	64	64	64	320
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	466	466	466	466	466	2,330
<i>ENERGY STAR Certified Connected Thermostats: ASHP</i>	2.2.12	Energy Savings (MWh) ²	14	28	43	43	43	170
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	20	40	60	60	60	240
<i>ENERGY STAR Certified Connected Thermostats: CAC-Only</i>	2.2.12	Energy Savings (MWh) ²	5	18	18	18	18	79
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	20	80	80	80	80	340
<i>ENERGY STAR Air Purifiers</i>	2.4.14	Energy Savings (MWh) ²	351	351	351	351	351	1,756
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.2
		Winter Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3
		Projected Participation ³	1,985	1,985	1,985	1,985	1,985	9,925
<i>High Efficiency Equipment: ASHP</i>	2.2.1	Energy Savings (MWh) ²	2,760	2,767	2,828	2,828	2,828	14,011
		Summer Demand Reduction (MW)	0.3	0.3	0.3	0.3	0.3	1.6
		Winter Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.7
		Projected Participation ³	2,256	2,262	2,312	2,312	2,312	11,454
<i>High Efficiency Equipment: CAC</i>	2.2.1	Energy Savings (MWh) ²	757	759	759	759	759	3,793
		Summer Demand Reduction (MW)	2.3	2.3	2.3	2.3	2.3	11.6
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	2,812	2,818	2,818	2,818	2,818	14,084
<i>High Efficiency Equipment: ENERGY STAR Most Efficient</i>	2.2.3	Energy Savings (MWh) ²	1,820	1,823	1,823	1,823	1,823	9,114
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.5

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
Ductless Mini-Split Heat Pump		Winter Demand Reduction (MW)	0.2	0.2	0.2	0.2	0.2	1.0
		Projected Participation ³	3,012	3,018	3,018	3,018	3,018	15,084
ECM Circulation Fans	2.2.4	Energy Savings (MWh) ²	961	962	962	962	962	4,811
		Summer Demand Reduction (MW)	0.3	0.3	0.3	0.3	0.3	1.5
		Winter Demand Reduction (MW)	0.2	0.2	0.2	0.2	0.2	0.9
		Projected Participation ³	5,010	5,016	5,016	5,016	5,016	25,074
Air Conditioner & Heat Pump Maintenance	2.2.6	Energy Savings (MWh) ²	332	332	332	332	332	1,662
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.6
		Winter Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.5
		Projected Participation ³	1,057	1,057	1,057	1,057	1,057	5,285
Duct Sealing & Duct Insulation	2.2.10	Energy Savings (MWh) ²	42	42	42	42	42	209
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	146	146	146	146	146	730
Furnace Maintenance	2.2.13	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	-	-	-	-	-	-
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	11	11	11	11	11	55
ENERGY STAR Bathroom Exhaust Fan	2.2.14	Energy Savings (MWh) ²	15	15	15	15	15	73
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	212	212	212	212	212	1,060
Heat Pump Water Heaters	2.3.1	Energy Savings (MWh) ²	542	553	560	560	560	2,777
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	0.1	0.3	0.3	0.3	0.3	1.1
		Projected Participation ³	302	308	312	312	312	1,546
Residential Air Sealing	2.6.1	Energy Savings (MWh) ²	45	45	45	45	45	227
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Winter Demand Reduction (MW)	0.0	0.1	0.1	0.1	0.1	0.5
		Projected Participation ³	82	82	82	82	82	410
Ceiling/Attic, Wall, Floor and Rim Joist Insulation: Ceiling/Attic	2.6.3	Energy Savings (MWh) ²	109	109	109	109	109	544
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.2	0.2	0.2	0.2	0.8
		Projected Participation ³	61	61	61	61	61	305
Ceiling/Attic, Wall, Floor and Rim Joist Insulation: Wall Insulation	2.6.3	Energy Savings (MWh) ²	15	15	15	15	15	74
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	80	80	80	80	80	400
Ceiling/Attic, Wall, Floor and Rim Joist Insulation: Floor Insulation	2.6.3	Energy Savings (MWh) ²	22	22	22	22	22	110
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	20	20	20	20	20	100
Ceiling/Attic, Wall, Floor and Rim Joist Insulation: RJI Insulation	2.6.3	Energy Savings (MWh) ²	34	34	34	34	34	172
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.1
		Projected Participation ³	93	93	93	93	93	465
Basement or Crawl Space Wall Insulation	2.6.4	Energy Savings (MWh) ²	3	3	3	3	3	17
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	4	4	4	4	4	19
ENERGY STAR Windows	2.6.5	Energy Savings (MWh) ²	3	6	12	15	17	53
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	10	20	40	48	58	176
Water Heater Pipe Insulation: Kit	2.3.5	Energy Savings (MWh) ²	412	412	412	412	412	2,060
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.2
		Winter Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.4
		Projected Participation ³	20,000	20,000	20,000	20,000	20,000	100,000
Room Air Conditioners	2.2.7	Energy Savings (MWh) ²	36	36	36	36	36	179
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1,420	1,420	1,420	1,420	1,420	7,100
Window Heat Pump	2.2.9	Energy Savings (MWh) ²	94	94	94	94	94	469
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.4	0.4	0.4	0.4	0.4	2.0
		Projected Participation ³	150	150	150	150	150	750
ENERGY STAR Refrigerators	2.4.1	Energy Savings (MWh) ²	656	800	944	944	944	4,286
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.6
		Winter Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.5
		Projected Participation ³	9,100	11,100	13,100	13,100	13,100	59,500
ENERGY STAR Clothes Washers	2.4.8	Energy Savings (MWh) ²	310	371	433	433	433	1,981
		Summer Demand Reduction (MW)	0.0	0.1	0.1	0.1	0.1	0.3

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	0.0	0.1	0.1	0.1	0.1	0.3
		Projected Participation ³	5,000	6,000	7,000	7,000	7,000	32,000
ENERGY STAR Clothes Dryers	2.4.9	Energy Savings (MWh) ²	364	448	532	532	532	2,407
		Summer Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.3
		Winter Demand Reduction (MW)	0.1	0.1	0.1	0.1	0.1	0.4
		Projected Participation ³	4,350	5,350	6,350	6,350	6,350	28,750
ENERGY STAR Dehumidifiers	2.4.11	Energy Savings (MWh) ²	1,763	1,763	1,763	1,763	1,763	8,816
		Summer Demand Reduction (MW)	0.4	0.4	0.4	0.4	0.4	1.8
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	7,100	7,100	7,100	7,100	7,100	35,500
Photovoltaic (PV) Solar Generation	2.8.3	Energy Savings (MWh) ²	13,601	13,601	13,601	13,601	13,601	68,003
		Summer Demand Reduction (MW)	3.3	3.3	3.3	3.3	3.3	16.6
		Winter Demand Reduction (MW)	0.4	0.4	0.4	0.4	0.4	1.9
		Projected Participation ³	1,500	1,500	1,500	1,500	1,500	7,500
Water Heater Pipe Insulation - Instant Markdown	2.3.5	Energy Savings (MWh) ²	5,591	5,591	5,591	5,591	5,591	27,956
		Summer Demand Reduction (MW)	0.6	0.6	0.6	0.6	0.6	3.2
		Winter Demand Reduction (MW)	1.1	1.1	1.1	1.1	1.1	5.3
		Projected Participation ³	75,040	75,040	75,040	75,040	75,040	375,200
Residential Occupancy Sensors	2.1.2	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	-	-	-	-	-	-
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1	1	1	1	1	5
Holiday Lights	2.1.4	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	-	-	-	-	-	-

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1	1	1	1	1	5
<i>High Efficiency Equipment for Midstream Delivery: ASHP, CAC, PTAC, PTHP</i>	2.2.2	Energy Savings (MWh) ²	1	1	1	1	1	4
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
<i>GSHP Desuperheaters</i>	2.2.5	Energy Savings (MWh) ²	1	1	1	1	1	3
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1	1	1	1	1	5
<i>Air Handler Filter Whistles</i>	2.2.11	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
<i>Solar Water Heaters</i>	2.3.2	Energy Savings (MWh) ²	2	2	2	2	2	9
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
<i>Drain Water Heat Recovery Units</i>	2.3.9	Energy Savings (MWh) ²	0	0	0	0	0	1
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
<i>ENERGY STAR Freezers</i>	2.4.2	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
ENERGY STAR Coolers	2.4.5	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
Cooler Recycling with and without Replacement	2.4.6	Energy Savings (MWh) ²	0	0	0	0	0	1
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
Residential Induction Cooktop	2.4.7	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
ENERGY STAR Dishwashers	2.4.10	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
ENERGY STAR Ceiling Fans	2.4.13	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Projected Participation ³	1	1	1	1	1	5
ENERGY STAR Pool Pumps	2.8.1	Energy Savings (MWh) ²	0	0	0	0	0	0
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1	1	1	1	1	5
Single Speed Pool Pump Replacement	2.8.2	Energy Savings (MWh) ²	1	1	1	1	1	4
		Summer Demand Reduction (MW)	0.0	0.0	0.0	0.0	0.0	0.0
		Winter Demand Reduction (MW)	-	-	-	-	-	-
		Projected Participation ³	1	1	1	1	1	5

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

PETITION OF PPL ELECTRIC	)	
UTILITIES CORPORATION FOR	)	
APPROVAL OF ITS ACT 129 PHASE	)	DOCKET NO. M-2025-3057329
V ENERGY EFFICIENCY AND	)	
CONSERVATION PLAN	)	

DIRECT TESTIMONY

OF

STACY L. SHERWOOD

**ON BEHALF OF
PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE**

January 20, 2026

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1 **I. INTRODUCTION**

2 Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS
3 ADDRESS?

4 A. My name is Stacy L. Sherwood. I am a Principal with Energy Futures Group
5 (“EFG”). Our office is located at 10298 Route 116, Hinesburg, Vermont
6 05461. EFG provides expert consulting services in the design and evaluation
7 of programs and policies that promote investments in efficiency, renewable
8 energy, distributed resources, and strategic electrification.

9 Q. ON WHOSE BEHALF ARE YOU APPEARING?

10 A. I am presenting testimony on behalf of the Pennsylvania Office of Consumer
11 Advocate (“OCA”).

12 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

13 A. On December 1, 2025, PPL Electric Utilities Corporation (“PPL” or
14 “Company”) filed a *Petition of PPL Electric Utilities Corporation for*
15 *Approval of its Act 129 Phase V Energy Efficiency and Conservation Plan*
16 *(“Plan”)*. EFG was retained by the OCA to assist in the review of PPL’s Plan.
17 I will address the cost-effectiveness, program design, the Plan’s compliance
18 with the Commission’s Phase V Implementation Order, and the reasonableness
19 of the overall Plan.

20 Q. PLEASE DESCRIBE YOUR QUALIFICATIONS, WORK EXPERIENCE,
21 AND EDUCATIONAL BACKGROUND.

22 A. I have more than 15 years of experience in the energy sector, specifically
23 related to the review and development of energy efficiency and demand
24 response programs, as well as experience with automated metering
25 infrastructure, cryptocurrency, and revenue requirements. I have reviewed

1 electric and natural gas efficiency programs in Arkansas, Connecticut, Iowa,
2 Kentucky, Maryland, Ontario, and Pennsylvania. I hold a Bachelor's Degree
3 in Accounting, Business, and Economics from McDaniel College. My
4 qualifications are summarized in my resume provided in Attachment A.

5 Q. HAVE YOU PREVIOUSLY TESTIFIED IN REGULATORY
6 PROCEEDINGS ON UTILITY ISSUES?

7 A. Yes. On behalf of the OCA, I have testified regarding prior Act 129 Plans for
8 PPL Electric Utilities and Duquesne Light Company in Phase III and IV. I also
9 have testified in numerous other cases before the Commission and other state
10 commissions, listed in my resume.

11 Q. HAVE YOU REVIEWED THE PHASE V PLAN?

12 A. Yes. I have reviewed the material filed in the Company's Plan, including the
13 Direct Testimony of Thomas McAteer and the Direct Testimony of Terry Fry.
14 I have also reviewed the Company's responses to the Coalition for Affordable
15 Utility Services and Energy Efficiency ("CAUSE-PA") Interrogatory Sets I-
16 IV, Sustainable Energy Fund (SEF) Interrogatory Set I, Office of Small
17 Business Advocate ("OSBA") Interrogatory Sets I and II and the OCA's
18 Interrogatory Sets I and II.

19 Q. PLEASE DESCRIBE THE MAIN COMPONENTS OF THE COMPANY'S
20 PLAN.

21 A. PPL's Plan includes three efficiency programs, including the Residential
22 Energy Efficiency Program ("REEP"), Resource Constrained Energy
23 Efficiency Program ("RCEEP") designed for low-income customers, and the
24 Business Energy Efficiency Program ("BEEP"). The three programs
25 collectively provide nine components or opportunities for participation. REEP

1 offers Energy Efficiency Homes, Appliance Recycling, Student Education,
2 and Persistent Peak Demand. This program is designed for residential market
3 rate customers and also has enhanced incentives for qualified moderate-
4 income customers between 151-250% of the Federal Poverty Level (“FPL”)
5 guidelines. RCEEP offers all the same components as REEP, except for
6 Persistent Peak Demand, for income qualified customers up to 150% of the
7 FPL. The BEEP offers the Small C&I Business Solutions and Large C&I
8 Business Solutions components. The Phase V Plan is designed to reduce
9 energy consumption by 1,066,059 MWh over the five-year Plan and peak
10 demand by 167 MW of coincident peak demand from energy efficiency
11 measures and 13 MW will be provided through demand response. Overall, the
12 Plan will cost \$307,506,888 million over the five years, excluding Statewide
13 Evaluator (“SWE”) costs, which is equivalent to spending 2% of PPL’s 2006
14 revenue, with annual budgets ranging from \$55.4 million to \$65.8 million.
15 The majority of the Plan’s programs are a continuation of Phase IV programs,
16 with the following key modifications:

- 17 • Expanded access to residential customers through the creation of a
18 Moderate Income incentive tier.
- 19 • Establish a \$1.5 million health and safety budget to address barriered
20 homes so that they may receive weatherization services.
- 21 • Plans to provide early engineering assistance, training, and certification
22 incentives for its commercial and industrial program offerings.
- 23 • Provide a residential persistent peak demand program through
24 thermostat optimization, electric vehicle managed charging, and
25 residential batteries.

- Expanded its income-eligible offerings to include components offered to all customers in prior phases, including Appliance Recycling and School Energy Education, so that the savings contribute to the Company's achievement of its low income carve-out target.
- Proposed pilots to assess residential conservation voltage reduction, residential peak time rebates, window saddle heat pumps for income-eligible multifamily properties, and a commercial and industrial daily load shifting pilot.

As part of the Phase V Commission Implementation Order, the Commission established consumption reduction targets, peak demand reduction targets, and low-income consumption reduction targets for each electric distribution company ("EDC"). Additionally, each EDC is limited to an annual budget of 2% of their 2006 revenues.¹ Table 1, below, compares the Company's proposed Plan with the Commission's Final Phase V targets and spending limits.

Table 1 Phase V Target Compliance

	Consumption Reduction (MWh)	Peak Demand Reduction (MW)	Low-Income Consumption Reduction (MWh)	Five Year Total Budget
Phase V Targets	828,231	151	65,678	\$307,506,880
PPL Proposed Plan	1,066,059	180.59	75,623	\$307,506,880

¹ As briefly highlighted in the OCA Comments submitted in response to the Implementation Order for Phase V at docket M-2025-3052826, the current budget cap has remained unchanged for more than 20 years and no longer reflects inflation, the increased cost of implementing comprehensive measures, or the need to address health and safety issues that prevent homes from participating. Consequently, the buying power of the funds has eroded, contributing to a significant decline in achieved energy savings over time.

1 A. Based on the results of my review and analysis, I have reached the following
2 conclusions and recommendations. Overall, the PPL Phase Plan is reasonable
3 and meets the requirements established by the Commission for Phase V. The
4 Company appropriately balances its portfolio investments and has proposed
5 pilots that could potentially add to Phase V savings in later years or be used to
6 inform the next Phase. The Plan does have its limitations and with the
7 following proposed modifications outlined below, Phase V has the potential to
8 provide benefits to Pennsylvania ratepayers the way Act 129 was designed to,
9 by promoting market transformative programs.

- 10 • The residential lighting market has matured and is highly
11 saturated. The Plan should cease investment in residential
12 lighting. The funding associated with residential lighting
13 should be reallocated to support weatherization measures
14 in the residential portfolio.
- 15 • Commercial lighting should be limited to 40% of the total
16 portfolio savings in PY 18, with investment gradually
17 declining over the Phase to reduce investment in
18 commercial lighting to be focused on lighting controls in
19 by PY 22.
- 20 • Discontinuing the HER program in Phase V is
21 recommended, as it is not cost-effective, is offered for
22 only three of the five years, delivers short-term savings,
23 and has received customer complaints regarding the
24 reports since their launch in PY16.

- The School Energy Education component should be limited solely to the educational curriculum and exclude the distribution of energy efficiency kits to students. The kits have demonstrated low in-service rates for the measures provided, and the Company does not track which students receive them. Consequently, there is no ability to verify installation rates or to determine whether the recipients reside in market-rate or low-income households. If the School Energy Education component is approved to continue, any energy savings associated with the distribution of kits should not be counted toward the Company's low-income carve-out achievement.
- The Appliance Recycling component of the RCEEP should not be counted towards the low income carve-out target for Phase V. The Company previously did not count this savings and was viewed as an offering to all customers regardless of income qualifications. The RCEEP should remain focused on home energy audits and installation of weatherization measures.
- The Company should review its Table 8 provided for the REEP Energy Efficient Homes component and as part of its rebuttal testimony provide revised incentives ranges for the Commission's consideration.

- The Company should commit to including engagement of Act 129 programs during the interconnection and economic development process.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. Following this introductory section, my testimony is divided into eight sections: Reasonableness of Plan, Lighting, Home Energy Reports (“HER”), School Education Component, Resource Constrained Program – Appliance Recycling Component, Incentive Ranges, Interconnections and Data Centers, and Conclusions.

II. REASONABLENESS OF PLAN

Q. HAVE YOU DETERMINED THE COMPANY’S PLAN TO BE COST-EFFECTIVE AND BENEFICIAL TO CONSUMERS?

The Plan, as proposed by PPL, is projected to have a gross cost-effective Total Resource Cost (“TRC”) of 1.77.² indicating that for every dollar spent, there is a \$1.77 in benefits recognized from the programs. Indicating that the benefits outweigh the cost of the Plan, which is important as the Company estimates that there will be no carryover savings from Phase IV. To assess program reasonableness, one needs to consider the design of the Plan, prior program performance, changes to the design and marketing efforts, and market impacts. One way to do that is to consider the net-to-gross impacts, which account for free ridership, spillover, and market efforts. These factors help to understand the level of impact the Plan has in driving energy and demand savings in the market. When adjusting for net-to-gross, the Plan is forecasted to achieve a

² PPL Phase V Plan, Table 57. Pa PUC Table 14B – Gross TRC Benefits, By Program and Total Portfolio at 215.

1 TRC of 1.69.³ This indicates that the cost of the Plan when accounting for net-
2 to-gross impacts still exceeds 1.0 in the TRC test and that the Plan is a primary
3 driver for participants to install energy efficiency measures.

4 Q. DO YOU BELIEVE THAT THE PLAN IS REASONABLE?

5 A. Yes, I do. The Plan itself is designed to achieve savings beyond the
6 Commission directed targets for energy consumption reduction, demand
7 reduction, and the low-income carve out. The Plan is designed to be cost-
8 effective and would likely remain so even if the actual results are not the same
9 as the forecasted measure mix. While I find the Plan to be reasonable and
10 comprehensive, I do have some recommendations for consideration that are
11 discussed in the remainder of my testimony.

12
13 **III. LIGHTING**

14 Q. WHAT ROLE DOES LIGHTING PLAY IN PPL'S PHASE V PLAN?

15 A. The Company's Plan is projected to have approximately 41% of its energy
16 savings, or more than 439,000 MWh, come from lighting measures. These
17 measures are as individual measures and as part of energy efficiency kits in the
18 REEP and RCEEP. The level of annual investment and savings from lighting
19 does decline year after year for the RCEEP and the BEEP. The REEP
20 participation and savings remain constant through Phase V, but lighting
21 measures are a minor contributor to that program's savings. Table 2 provides
22 a summary of the costs and savings associated with the lighting savings related
23 to residential, commercial, and street lighting.
24

³ PPL Phase V Plan, Table 56. Pa PUC Table 14A- - Net TRC Benefits, By Program and Total Portfolio, at 213.

Table 2 Phase V Lighting Savings⁴

	Savings (MWh)	Percent of Program Savings
Residential Energy Efficiency Portfolio	2,987	1.7%
Resource Constrained Program	26,075	34.5%
Business Energy Efficiency Program	410,201	49.9%
Total	439,263	41.2%

Q. WHY IS THE LEVEL OF SAVINGS FROM LIGHTING MEASURES CONCERNING?

A. While the measures are highly cost-effective at a gross level, the lighting market has matured and is highly saturated. The Act 129 programs have successfully transformed the market to be one where consumers are likely to install LED lighting absent program intervention, indicating that incentives are no longer necessary to encourage market activity and can lead to the reduced recognition of savings as LEDs are replaced with LEDs. As a result of the market transformation, one would expect the elimination of measures in a residential portfolio and that the business portfolio would have a decline in participation, with the final year focused on controlled lighting measures.

Q. WHAT EVIDENCE IS AVAILABLE TO SUPPORT A MATURE RESIDENTIAL LIGHTING MARKET?

A. Residential lighting is widely viewed as a market that has largely achieved transformation, particularly following the adoption of updated federal minimum efficiency standards for general service lamps. This is supported by

⁴ PPL Phase V Plan, Tables 17, 23, 32, 38, 48, and 49 showing the Pa PUC Table 9 for the various program components.

1 the 2023 Pennsylvania Statewide Act 129 Residential Baseline Study, which
2 found that LED lighting accounts for approximately 59 percent of all
3 residential sockets statewide, with LEDs occupying 44 percent of sockets in
4 the average Pennsylvania home, representing roughly a doubling since the
5 2018 baseline study.⁵ LED penetration was found to be nearly universal, with
6 approximately 99 percent of homes containing at least one LED bulb,
7 indicating a highly saturated and largely transformed residential lighting
8 market.

9 While residential LED lighting is still included in the Technical Reference
10 Manual (“TRM”), direct replacement assumes a measure life of two years,
11 recognizing the transformation of the market and decreasing the longevity of
12 savings. Furthermore, the Market Potential Study (“MPS”) assumed “virtually
13 no potential for residential lighting, despite EDCs still pursuing significant
14 lighting savings in Phase IV.”⁶

15 Q. WHAT EVIDENCE IS AVAILABLE TO SUPPORT A MATURING
16 COMMERCIAL LIGHTING MARKET?

17 A. The state’s Non-Residential Baseline Study noted that the commercial
18 lighting market has matured significantly in the past decade, increasing “the
19 percent of sites with LEDs jumped from 60 percent in 2018 to 82 percent in
20 2023. By count, LED technologies represent 60 percent of commercial lighting
21 statewide and 40 percent of the total installed wattage.”⁷ Since that study was
22 completed, there were two additional years of the commercial programs

⁵ NMR Group’s 2023 Pennsylvania Statewide Act 129 Residential Baseline Study, accessible at https://www.puc.pa.gov/media/2883/2023_pa_residential_baseline_study.pdf

⁶ Pennsylvania Energy Efficiency and Peak Demand Reduction Market Potential Study, Pennsylvania Statewide Evaluation, February 7, 2024, <https://www.puc.pa.gov/pdocs/1867286.pdf>, page 9.

⁷ *Id.*

1 influencing the lighting market, further growing concerns that there is a risk
2 for LED-to-LED replacements which will reduce the savings recognized by
3 the program. To this latter point, the Company indicated that it would rely on
4 customers and contractors attesting to the existing lighting technology being
5 replaced is not an LED and will perform random inspections.⁸ However, there
6 are often risks associated with reliance on self-reporting and the percentage
7 and frequency of inspection is unknown.

8 Q. WHAT IS YOUR RECOMMENDATION REGARDING LIGHTING IN
9 THE PHASE V PPL PLAN?

10 A. I recommend that the Company eliminate residential lighting measures as part
11 of its portfolio and invest those funds in longer-lived residential measures,
12 such as HVAC and weatherization measures. It is particularly concerning that
13 the savings for residential lighting can only be claimed for 2 years of the
14 portfolio but comprises 34 percent of the savings allocated for low income
15 customers. This means that the majority of that lighting savings is no longer
16 counted by the end of Phase V and won't be recognized two years after the
17 conclusion of Phase V. Programs designed to address the low income carve
18 out savings should be focused on longer-lived measures to encourage
19 persistent savings over multiple years and transferable to new residents that
20 may move into that home.

21 For the commercial lighting savings, given that the market is still maturing,
22 the commercial portfolio should limit lighting energy savings to 40% in PY
23 18, declining annually over Phase V to acknowledge the maturation of the
24 commercial lighting market. While the Market Potential Study indicated that

⁸ Company response to OCA 1-4.

1 62 percent of all potential non-residential savings are from lighting, it does not
2 mean that the Plan needs to reflect that.⁹ This is particularly true as the
3 commercial lighting market is reaching a saturated point. The Company should
4 strike a balance between investing in more costly measures that are harder to
5 adopt and reducing its reliance on lighting savings. The lower cost lighting
6 measures can be used to offset the more costly investment in measures like
7 commercial weatherization to maintain cost-effectiveness in Phase V. The
8 funds that were previously allocated to commercial lighting should be
9 refocused to support commercial envelope weatherization measures. While
10 commercial weatherization measures are typically more costly, they provide
11 longer lived savings, and the additional investment can be offset by the less
12 costly savings provided by lighting in Phase V.

13 14 **IV. HOME ENERGY REPORTS**

15 Q. PLEASE DESCRIBE THE HOME ENERGY REPORTS.

16 A. The Company plans to continue providing Home Energy Reports (“HERs”)
17 that it offered in PY 16 in Phase V through its REEP and RCEEP. The HER
18 will be provided PY 18 through PY 20, to reduce customer fatigue with the
19 reports.¹⁰ However, the Company is making a significant adjustment to the
20 report from what other EDCs offer, what PPL offered in PY 16, and what has
21 been evaluated by the SWE. Phase V HERs will have the home comparison
22 component of the report removed. The Company indicated that the decision to
23 remove the home comparison was based upon results of a survey that indicated
24 that control group survey respondents were less than satisfied with the report,

⁹ Company response to OCA 1-4.

¹⁰ Company response to OCA 1-10.

1 with the most frequent reason being that they did not believe the home
2 comparisons were accurate. There was also feedback through another avenue
3 that customers preferred not to be compared to similar homes.¹¹

4 Over first three years, the HERs represent 4.5 percent of the total Plan savings.
5 Due to the behavioral nature of the HERs, the savings resulting from this effort
6 are short lived, cannot be transferred between owners, and the savings impact
7 varies based upon usage and house size.

8 Q. DO YOU HAVE CONCERNS WITH SIGNIFICANT RELIANCE ON
9 HERS FOR RESIDENTIAL SAVINGS?

10 A. Yes. HER savings are behavioral in nature and do not result in permanent
11 physical improvements to customer homes, which means that savings require
12 ongoing program expenditures to sustain and do not provide the same long-
13 term certainty as equipment-based or building envelope measures; measures
14 such as heat pumps and insulation have 15-year measure lives providing an
15 opportunity for greater lifetime savings. Moreover, due to the lack of physical
16 improvements, HER savings do not persist across homeowners or tenants
17 when occupancy changes within a housing unit.

18 In addition, the per-household energy savings associated with behavioral
19 measures are generally modest relative to comprehensive efficiency upgrades.
20 As a result, HER programs typically have a limited ability to meaningfully
21 reduce household energy burden, particularly for customers facing high fixed
22 energy costs or inefficient building conditions. Behavioral savings also tend to
23 be driven disproportionately by higher-usage customers, which may affect
24 how program benefits are distributed across income groups. There is also

¹¹ Company response to OCA 1-10.

1 concern about how much savings will be recognized with the removal of the
2 home comparison.

3 Finally, the SWE Final Annual Report for PY 16 identified that in its first year
4 the HER component had a gross TRC of 0.36, which was the lowest across
5 PPL's programs.¹² While a positive TRC is not required at the measure level, it
6 should still be considered when assessing the measures for inclusion in the
7 portfolio.

8 Q. WHAT IS THE PORTFOLIO-LEVEL IMPLICATIONS OF INCREASED
9 RELIANCE ON BEHAVIORAL SAVINGS SUCH AS HER?

10 A. From a portfolio perspective, reliance on behavioral savings concentrates a
11 share of residential savings in measures with shorter effective lives and modest
12 per participant savings. Additionally, as noted by the Company, few recipients
13 of the HER participate in another program or component. In PY 16, 0.43% of
14 HER recipients participated in another program.¹³ Indicating that it is not a
15 beneficial marketing tool to increase participation in other residential
16 programs. This concentration increases portfolio risk relative to portfolios with
17 a higher share of long-lived, equipment-based savings and reduces flexibility
18 if savings underperform or decay more rapidly than anticipated.

19 National best practice on energy efficiency portfolio design emphasizes the
20 importance of balancing short-lived measures with longer-lived measures that
21 deliver durable savings over time. Research by the American Council for an
22 Energy-Efficient Economy ("ACEEE") notes that portfolios overly oriented
23 toward short-term savings may inadvertently prioritize measures that are cost-
24 effective on a first-year basis but provide less cumulative value if lifetime

¹² SWE Final Annual Report: Act 129 Program Year 16, December 1, 2025, at 52.

¹³ Company response to OCA II-4.

1 savings are not explicitly considered.¹⁴ Given the fixed budgets associated with
2 Act 129 programs, greater reliance on HER savings may therefore limit the
3 extent to which program resources are directed toward more comprehensive
4 residential strategies, such as building envelope improvements and residential
5 heat pump technologies. Phase V presents an opportunity to leverage near-term
6 behavioral savings while beginning to rebalance the residential portfolio toward
7 more durable strategies that provide longer-lived savings and greater long-term
8 value for ratepayers.

9 Q. WHAT IS YOUR RECOMMENDATION FOR INCLUSION OF HER IN
10 THE RESIDENTIAL PORTFOLIO?

11 A. Based on the short-lived savings resulting from the HER, the Company's
12 adjustment to the HER, and the low TRC, I would recommend that the
13 Company not pursue this component in Phase V. The funds dedicated to HER
14 should be invested in longer-lived measures, including audits and rebates for
15 weatherization and HVAC. Should the Commission approve a plan inclusive
16 of HER reporting, then I recommend keeping comparative analyses to other
17 homes, even if some customers express discomfort with the comparative data.
18 They provide critical context that absolute usage data alone cannot, enabling
19 customers to identify inefficiencies and take action. Removing these
20 comparisons could reduce program effectiveness, increase portfolio risk, and
21 undermine Act 129 objectives. Comparative feedback can be delivered in a
22 constructive, anonymized manner to mitigate customer concerns while
23 preserving its proven impact. For these reasons, comparative analyses remain

¹⁴ American Council for an Energy-Efficient Economy (ACEEE), *Measuring and Valuing Lifetime Energy Savings in Policy and Planning*, Report U1902 (2019).

1 an essential, prudent component of behavioral EE&C programs in
2 Pennsylvania.
3

4 **V. SCHOOL EDUCATION COMPONENT**

5 Q. PLEASE SUMMARIZE THE SCHOOL EDUCATION COMPONENTS OF
6 THE PLAN.

7 A. The Company's plan has two School Education components, one for market
8 rate customers and another for low-income customers. The program provides
9 educational presentations on energy saving, management, and conservation
10 through school-based events and in classes. These presentations are provided
11 for grades 2-12. Participating students receive an energy efficiency kit
12 including lighting (LED bulbs and nightlights), air handler filter whistle, water
13 heater temperature setback, low flow faucet aerators and showerheads, and
14 advanced power strips. Through PY 16, the Company has provided over
15 267,000 energy efficiency kits through this program. PPL is the only EDC to
16 propose a School Energy Education component in Phase V. While this
17 component was offered in prior phases, the savings were not counted towards
18 the low income carve-out, this is a change for Phase V.

19 Q. DO YOU HAVE CONCERNS WITH THE NEW SCHOOL ENERGY
20 EDUCATION COMPONENT?

21 A. Yes, my primary concern is with the offering of kits. The Company does not
22 track the kit recipient's information and as such does not know whether a
23 household receives multiple kits and cannot conduct surveys regarding
24 installation rates. The Company is seeking to have this component be offered
25 not only to market rate customers but will be counting a portion of the savings

1 towards its low income carve-out target, without knowing whether a low
2 income household received the kit. Furthermore, kit measures have low in-
3 service rates for the various measures, which means that ratepayers dollars are
4 being invested in measures that may never be utilized.

5 If the Company wanted to offer the energy education component as education
6 or outreach, they could do so without making it a program. Other EDCs in Phase
7 V have proposed using welcome kits not as a program component but to
8 encourage customers to participate in their programs or to provide energy
9 education.

10 Q. WHAT IS YOUR RECOMMENDATION FOR THE SCHOOL ENERGY
11 EDUCATION COMPONENTS?

12 A. I recommend that the School Energy Education component be discontinued as
13 program component. The Company can continue to provide the education
14 portion of the initiative; however, it should not offer the kits. The funds
15 focused on the kits should be redirected to weatherization measures that can
16 be tracked.

17 If the Company is approved to offer kits, it should only be under the REEP.
18 No savings from the School Education component should be counted towards
19 the low income carve-out target unless the installation can be verified that it
20 was installed in an income eligible household. The funds that were allocated
21 to the School Education Component under the RCEEP should be reallocated
22 to weatherization measures to provide long lasting saving in verified low-
23 income households.

24 **VI. RCEEP – APPLIANCE RECYCLING COMPONENT**

25 Q. PLEASE DESCRIBE THE APPLIANCE COMPONENT OF THE RCEEP.

1 A. In Phase V, the Company will count savings from low-income households
2 under the Appliance Recycling component towards its low income carve-out
3 target. The Appliance Recycling program will offer rebates for the recycling
4 of room air conditioners, refrigerators/freezers, and dehumidifiers. There is no
5 difference in the rebate level provided to the market rate customers and those
6 participating under the RCEEP.

7 Q. ARE YOU CONCERNED ABOUT THE APPLIANCE RECYCLING
8 COUNTING TOWARDS THE LOW INCOME CARVE-OUT?

9 A. Yes. The Company is making a significant shift in its dedicated low income
10 program by claiming savings from components that were not previously
11 targeted to low income customers, but all residential customers. In prior
12 phases, the low income component was primarily focused on providing audits
13 and weatherization measures. While the Company is still focusing the majority
14 of the first-year savings on that (approximately 83%), it seems that the shift
15 away from that is lower than the long-lasting savings the program previously
16 focused on and will be incentivizing measures that will not be utilized or may
17 not end up in a low-income household.

18 Q. WHAT IS YOUR RECOMMENDATION RELATED TO THE RCEEP
19 APPLIANCE RECYCLING COMPONENT?

20 I recommend that the Appliance Recycling component be limited to the REEP.
21 Any dedicated funding to achieve savings towards the low income carve-out
22 target should be focused on home energy assessments and weatherization
23 measures. With the dedicated \$1.5 million to addressing health and safety
24 measures, there will hopefully be more homes that can be addressed through

1 the RCEEP that otherwise may have been deferred under the current proposed
2 Plan.

3
4 **VIII. INCENTIVE RANGES**

5 Q. DO YOU HAVE ANY CONCERNS WITH THE PHASE V INCENTIVE
6 RANGES PROPOSED THE COMPANY?

7 A. Yes. It appears that the Company has provided excessive incentive ranges for
8 certain measures offered under the REEP Energy Efficient Homes component.
9 While it is important for the Company to have flexibility with its incentives to
10 timely respond to shifts in demand and changes in incremental costs due to the
11 market, the incentive ranges should still be reasonable and not give way to
12 potential excessive rebate amounts. For example, the incentive range for an
13 ENERGY STAR ceiling fan is up to \$2,000 and a low-flow faucet aerator is
14 up to \$50. If the Company wants to get approval for its Plan, it should provide
15 reasonable and realistic incentive ranges that consider the incremental cost.

16 Q. WHAT DO YOU RECOMMEND BE CHANGED ABOUT THE
17 INCENTIVE RANGES PROVIDED IN TABLE 8 OF THE COMPANY'S
18 PLAN?

19 A. I recommend that the Company review its Table 8 provided for the REEP
20 Energy Efficient Homes component and as part of its rebuttal testimony
21 provide revised incentives ranges for Commission consideration.

22
23 **IX. ENERGY EFFICIENCY AT POINT OF INTERCONNECTION**

24 Q. DO YOU BELIEVE THERE ARE MISSED OPPORTUNITIES FOR THE
25 ACT 129 PROGRAMS?

A. Yes. After reviewing the Company's interconnection process, the Company could miss an opportunity to promote energy efficiency and its Act 129 programs at the time of interconnection. When the Company assesses the capacity and system needs for a new customer, it should also consider whether the design of the facility is energy efficient and if there are potential opportunities for demand reduction, demand response, and interruptible load. There are a few ways that this opportunity can be highlighted for customers looking to interconnect. First, the Company could develop pathways for customers that it may have frequent interest from, such as data centers. Second, even without a pathway, the Company should be establishing a connection between the Act 129 program staff/account managers and the potential customer. Third, the Act 129 program staff can work with the Company's economic development team or its region/state's economic development team to make them aware of the Act 129 opportunities. Incorporating energy efficiency at this stage of the process enables the EDC to minimize missed opportunities and helps ensure that homes and businesses within its service territory achieve optimal efficiency. The Company should commit to including engagement of Act 129 programs during the interconnection and economic development process.

XI. CONCLUSIONS

Q. PLEASE PROVIDE A SUMMARY OF YOUR RECOMMENDATIONS FOR THE COMPANY'S PLAN.

A. Overall, while PPL's proposed Phase V Plan generally reflects a balanced approach and is responsive to the Commission's Phase V targets and

1 requirements, there are several areas where the Plan would benefit from
2 refinement. Based on my review, and recognizing that reasonable differences
3 of opinion exist regarding optimal portfolio design, I offer the following
4 recommendations to improve the Plan and ensure greater alignment with
5 Commission objectives:

- 6 • The residential lighting market has matured and is highly
7 saturated. The Plan should cease investment in residential
8 lighting. The funding associated with residential lighting
9 should be reallocated to support weatherization measures
10 in the residential portfolio.
- 11 • Commercial lighting should be limited to 40% of the total
12 portfolio savings in PY 18, with investment gradually
13 declining over the Phase to reduce investment in
14 commercial lighting to be focused on lighting controls in
15 by PY 22.
- 16 • Discontinuing the HER program in Phase V is
17 recommended, as it is not cost-effective, is offered for
18 only three of the five years, delivers short-term savings,
19 and has received customer complaints regarding the
20 reports since their launch in PY16.
- 21 • The School Energy Education component should be
22 limited solely to the educational curriculum and exclude
23 the distribution of energy efficiency kits to students. The
24 kits have demonstrated low in-service rates for the
25 measures provided, and the Company does not track

1 which students receive them. Consequently, there is no
2 ability to verify installation rates or to determine whether
3 the recipients reside in market-rate or low-income
4 households. If the School Energy Education component
5 is approved to continue, any energy savings associated
6 with the distribution of kits should not be counted toward
7 the Company's low-income carve-out achievement.

- 8 • The Appliance Recycling component of the RCEEP
9 should not be counted towards the low income carve-out
10 target for Phase V. The Company previously did not
11 count these savings and was viewed as an offer to all
12 customers regardless of income qualifications. The
13 RCEEP should remain focused on home energy audits
14 and installation of weatherization measures.
- 15 • The Company should review its Table 8 provided for the
16 REEP Energy Efficient Homes component and as part of
17 its rebuttal testimony provide revised incentives ranges
18 for Commission consideration.
- 19 • The Company should commit to including engagement of
20 Act 129 programs during the interconnection and
21 economic development process.

22
23 Q. WITH THE PROPOSED CHANGES YOU HAVE RECOMMENDED, DO
24 YOU BELIEVE THAT THE COMMISSION SHOULD APPROVE THE
25 PLAN?

1 A. Yes, with incorporation of my recommendations, I do believe the Commission
2 should approve the Phase V Plan.

3 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

4 A. Yes, it does.

ATTACHMENT A

QUALIFICATIONS OF
STACY L. SHERWOOD



Stacy has over 15 years of experience in the energy industry, specializing in energy efficiency (EE), demand response (DR), automated metering infrastructure (AMI), cost recovery, and renewable energy. Stacy has testified or provided comments before 11 public service commissions on AMI, EE, protections for cryptocurrency related load growth, and reasonableness of revenue increases. Throughout her career, Stacy has evaluated various electric and natural gas EE and DR plans; potential studies; evaluation, measurement, and verification reports; environmental justice impacts, and riders for cost recovery. Since 2021, Stacy has immersed herself in Connecticut's energy goals and policy, serving as the Lead Technical Consultant on behalf of the Connecticut Energy Efficiency Board. Recently, she has begun providing support to jurisdictions on establishing a cost-benefit framework to evaluate distributed energy resources (DERs) and identifying safeguards related to large loads, such as data centers and cryptomining.

✉ ssherwood@energyfuturesgroup.com ☎ (410) 371-0623 📍 Mooresville, NC

EXPERIENCE

Principal

Energy Futures Group, Hinesburg, VT
2024 - Present

Managing Consultant

Energy Futures Group, Hinesburg, VT
2021 - 2023

Senior Analyst

Exeter Associates, Inc., Columbia, MD
2015 - 2021

Assistant Director of Energy, Analysis, and Planning Division

Maryland Public Service Commission,
Baltimore, MD
2013 - 2015

Regulatory Economist II

Maryland Public Service Commission,
Baltimore, MD
2011 - 2013

Regulatory Economist I

Maryland Public Service Commission,
Baltimore, MD
2009 - 2011

EDUCATION

McDaniel College

B.A., Business Administration,
Economics, Accounting/Economics
2009

SELECT PROJECTS

Connecticut Energy Efficiency Board

2021 - Present

Lead Technical Consultant on the oversight of the state's electric and gas residential energy efficiency programs. Work closely with the state's utilities to develop, implement, and evaluate cost-effective program designs and goals for the Three-Year Conservation and Load Management Plan.

Pennsylvania Office of Consumer Advocate

2015 - 2021, 2023 - Present

Reviewed and commented on potential studies utilized to develop energy efficiency and demand response targets for Phases III, IV, and IV of the Act 129 Energy Efficiency and Conservation (EE&C) Program. Provided written testimony on utility EE&C five-year plans.

Earthjustice

2025

Authored *Review of Large Load Tariffs to Identify Safeguards and Protections for Existing Ratepayers* (January 28, 2025), which summarized research on tariff mechanisms and language to limit negative impacts of new data center and cryptocurrency loads on a service territory's existing customers.

Natural Resources Defense Council

2021 - 2022

Filed testimony before the Kansas Corporation Commission to support the adoption of energy efficiency programs for the first time in the Evergy service territory. Worked with parties to negotiate program design and implementation, as well as the performance incentive mechanism.

Louisiana Public Service Commission

2020 - 2021

Filed testimonies evaluating the reasonableness of automated metering infrastructure implementation plans by Concordia Electric Cooperative, Inc., Southwest Louisiana Electric Membership Corporation, and Point Coupee Electric Membership Corporation.

(continued on next page)

SELECT PROJECTS (continued)

Arkansas Attorney General's Consumer Utility Rate Advocacy Division 2018 - 2020

Drafted a dedicated limited income EE program strawman implemented on a pilot basis by the electric and natural gas utilities.

Arkansas Attorney General's Consumer Utility Rate Advocacy Division 2017 - 2021

Participated in Parties Working Collaboratively (PWC) group regarding the electric and natural gas EE programs. Provided comments on three-year plans, annual progress reports, and evaluation, measurement, and verification reports.

Maryland Public Service Commission Staff (2009 - 2015)

Developed templates and directed work groups related to the implementation of the electric and natural gas EmPOWER Maryland EE and DR programs. Evaluated the semi-annual reports and three-year plans filed by the utilities and submitted comments regarding plan recommendations before the Maryland Public Service Commission.

PUBLICATIONS

Sherwood, Stacy. 2025. *Review of Large Load Tariffs to Identify Safeguards and Protections for Existing Ratepayers*. Earthjustice.

<https://energyfuturesgroup.com/wp-content/uploads/2025/01/Review-of-Large-Load-Tariffs-to-Identify-Safeguards-and-Protections-for-Existing-Ratepayers-Report-Final.pdf>.

EXPERT TESTIMONY

Before the Kentucky Public Service Commission, Case No. 2025-00045. *In the Matter of Electronic Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates*, June 16, 2025, on behalf of Sierra Club. Testified regarding the proposal to allow a regulatory asset to cover post-in-service costs related to generating station construction.

Before the Georgia Public Service Commission, Docket Nos. 56002 and 56003. *In Re: Georgia Power Company's 2025 Integrated Resource Plan and Georgia Power Company's 2025 Application for the Certification, Decertification, and Amended Demand-Side Management Plan*, May 2, 2025, on behalf of Georgia Interfaith Power & Light and Southface Energy Institute. Testified regarding the reasonableness of the proposed DSM plan and to support additional energy efficiency and demand savings as part of the Integrated Resource Plan.

Before the Pennsylvania Public Utilities Commission, Docket No. M-2024-3048418. *Petition of UGI Utilities, Inc. – Gas Division for Approval of its Phase II Energy Efficiency and Conservation Plan*, February 2025, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of proposed Plan. (Case settled prior to cross-examination.)

Before the Public Service Commission of Wisconsin, Case No. 6630-CE-317. *Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct and Operate the South Oak Creek Combustion Turbine Project in the City of Oak Creek, Milwaukee County, Wisconsin*, February 2025, on behalf of Clean Wisconsin. Testified on increased need for energy efficiency in the Wisconsin Electric Power Company service territory. (Ongoing).

Before the Public Service Commission of Wisconsin, Case No. 6630-CE-316. *Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct and Operate the Paris Reciprocating Internal Combustion Engines Project, Consisting of Seven Natural Gas-Fired Reciprocating Internal Combustion Engines Generating up to 128 MW Total at the Lakeshore Capacity Improvement Project Regulator Station in the Town of Paris, Kenosha County, Wisconsin*, December 2024, on behalf of Clean Wisconsin. Testified on increased need for energy efficiency in the Wisconsin Electric Power Company service territory. (Ongoing).

EXPERT TESTIMONY (continued)

Before the Kentucky Public Service Commission, Case No. 2024-00115. *In the matter of Electronic Application of Kentucky Power Company For: (1) Approval to Expand its Targeted Energy Efficiency Program; (2) Approval of a Home Energy Improvement Program and a Commercial Energy Solutions Program; (3) Authority to Recover Costs and Net Lost Revenues, and to Receive Incentives Associated with the Implementation of its Demand Side Management/Energy Efficiency Programs; (4) Approval of Revised Tariff D.S.M.C.; (5) Acceptance of its Annual DSM Status Report; and (6) All Other Required Approvals and Relief*, May 2024, on behalf of Mountain Association, Appalachian Citizens' Law Center, Kentuckians for the Commonwealth, and Kentucky Solar Energy Society. Testified on the reasonableness of the proposed demand side management programs and cost recovery mechanism.

Before the Public Service of South Carolina Docket No. 2023-388-E. *In the matter of Application of Duke Energy Carolinas, LLC for Authority to Adjust and Increase its Electric Rates, Adjustments in Electric Rate Schedules and Tariffs, and Request for an Accounting Order*, April 2024, on behalf of the South Carolina Conservation League, Southern Alliance for Clean Energy, and Vote Solar. Testified regarding impact of rate increase on customer energy burden and the benefits of energy efficiency to offset rate impact.

Before the Commonwealth of Virginia State Corporation Commission Case No. PUR-2023-000169. *Petition of Appalachian Power Company for approval to continue a rate adjustment clause, the EE-RAC, and for approval of new energy efficiency programs pursuant to § 56-585.1 A 5 c and 56-596.2 of the Code of Virginia*, March 2024, on behalf of the Appalachian Voices. Testified regarding reasonableness of proposed Plan.

Before the Public Service Commission of the State of Missouri, File No. EO-2023-0136. *In the matter of Union Electric Company d/b/a Ameren Missouri's 4th Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA*, March 2024, on behalf of the National Resources Defense Council. Testified regarding reasonableness of proposed Plan.

Before the Pennsylvania Public Utilities Commission, Docket No. M-2023-3043230. *Petition of UGI Utilities, Inc. – Electric Division for Approval of its Energy Efficiency and Conservation Plan*, September 2023, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of proposed Plan. (Case settled prior to cross-examination.)

Before the Commonwealth of Kentucky before the Public Service Commission, Case No. 2022-00424. *In the Matter of Electronic Tariff Filing of Kentucky Power Company for Approval of a Special Contract Under Its Economic Development Rider and Demand Response Service Tariffs with Cyber Innovation Group, LLC.*, on behalf of the Mountain Association, Kentuckians for the Commonwealth, Appalachian Citizens' Law Center, Sierra Club, and Kentucky Resources Council. Testified on the merits of providing an economic development discount rate to a proposed crypto mining facility as it relates to ratepayer risk.

Before the Commonwealth of Kentucky before the Public Service Commission, Case No. 2022-00387. *In the Matter of Electronic Tariff Filing of Kentucky Power Company for Approval of a Special Contract with Ebon International, LLC.*, on behalf of the Mountain Association, Kentuckians for the Commonwealth, Appalachian Citizens' Law Center, Sierra Club, and Kentucky Resources Council, Inc. Testified on the merits of providing an economic development discount rate to a proposed crypto mining facility as it relates to ratepayer risk.

Before the Commonwealth of Kentucky before the Public Service Commission, Case No. 2022-00037. *In the Matter of Electronic Tariff Filing of Kentucky Utilities Company for Approval of an Economic Development Rider Special Contract with Bitiki-KY, LLC.*, on behalf of Kentuckians for the Commonwealth, Kentucky Solar Energy Society, Mountain Association, and Kentucky Resources. Testified on the merits of providing an economic development discount rate to a proposed crypto mining facility as it relates to ratepayer risk.

Before the State of Maine Public Utilities Commission, Docket No. 2022-0025. *Versant Power Request for Approval of a Distribution Rate Change – 307*, December 2022, for Maine Office of Consumer Advocate. Testified regarding the reasonableness of the overall revenue increase.

Before the Kansas Corporation Commission, Docket No. 22-EKME-254-TAR. *In the Matter of the Application of Evergy Kansas Metro, Inc., Evergy Kansas South, Inc. and Evergy Kansas Central, Inc. for Approval of its Demand-Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA")*, K.S.A. 66-1283, June 2022, for Natural Resources Defense Council. Testified regarding reasonableness of the proposed Plan and its compliance with the KEEIA Act.

EXPERT TESTIMONY (continued)

Before the Louisiana Public Service Commission, Docket No. U-35877. *Pointe Coupee Electric Membership Corporation Application to Acquire and Install an Automated Metering System and Request for Cost Recovery and Related Relief*, February 2021, for the Louisiana Public Service Commission Staff. Testified regarding the implementation of automated metering infrastructure to replace current meters. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2020-3020818. *Petition of Duquesne Light Company for Approval of its Energy Efficiency and Conservation Phase IV Plan*, January 2021, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2020-3020830. *Petition of PECO Energy Company for Approval of its Energy Efficiency and Conservation Phase IV Plan*, January 2021, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2020-3020824. *Petition of PPL Electric Utilities for Approval of its Energy Efficiency and Conservation Phase IV Plan*, January 2021, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Louisiana Public Service Commission, Docket No. U-35707. *Southwest Louisiana Electric Membership Corporation. Application for Approval to Acquire and Install an Automated Metering System and Request for Cost Recovery and Related Relief*, December 2020, for the Louisiana Public Service Commission Staff. Testified regarding the implementation of automated metering infrastructure to replace current meters. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2020-3020919. *Pennsylvania Public Utility Commission v. Audubon Water Company*, November 2020, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2020-3020256. *Pennsylvania Public Utility Commission v. City of Bethlehem – Water Department*, November 2020, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Louisiana Public Service Commission, Docket No. U-35456. *Concordia Electric Cooperative Inc. Application for Certification of a Replacement Advanced Metering System and Approval of Related Financing*, November 2020, for the Louisiana Public Service Commission Staff. Testified regarding the implementation of automated metering infrastructure to replace current meters. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2020-3019612. *Pennsylvania Public Utility Commission v. Reynolds Disposal Company*, October 2020, for the Pennsylvania Office of Consumer Advocate. Participated in mediation regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3010955. *Pennsylvania Public Utility Commission v. City of Lancaster – Sewer Fund*, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008208. *Pennsylvania Public Utility Commission v. Wellsboro Electric Company*, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008209. *Pennsylvania Public Utility Commission v. Valley Energy, Inc.*, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

EXPERT TESTIMONY (continued)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008212. *Pennsylvania Public Utility Commission v. Citizens' Electric Company of Lewisburg, PA*, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3009559. *Pennsylvania Public Utility Commission v. Eaton Sewer & Water Company, Inc. – Wastewater Division*, August 2019, for the Pennsylvania Office of Consumer Advocate. Participate in mediation regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3009567. *Pennsylvania Public Utility Commission v. Eaton Sewer & Water Company, Inc. – Water Division*, August 2019, for the Pennsylvania Office of Consumer Advocate. Participate in mediation regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008947. *Pennsylvania Public Utility Commission v. Community Utilities of Pennsylvania Inc. Water Division*, July 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008948. *Pennsylvania Public Utility Commission v. Community Utilities of Pennsylvania Inc. Wastewater Division*, July 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3006904. *Pennsylvania Public Utility Commission v. The Newtown Artesian Water Company (Supplement No. 136 to Tariff Water – Pa. P.U.C. No. 9)*, March 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2018-3006814. *Pennsylvania Public Utility Commission v. UGI Utilities, Inc – Gas Division (Utility Code 123100, Filed Tariff Gas- Pa. P.U.C. Nos. 7 and 7S)*, January 2019, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of its proposed consolidated natural gas energy efficiency plan. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2018-3004144. *Petition of UGI Utilities, Inc. – Electric Division for Approval of its Energy Efficiency and Conservation Plan*, August 2018, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of proposed Plan. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2018-3001307. *Pennsylvania Public Utility Commission v. Hidden Valley Utility Services, L.P. – Wastewater (General Rate Increase Filed Pursuant to 66 PS. CS 1308, Including Answers to 52 PA. Code 53.52)*, April 2018, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding the reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2018-3001306. *Pennsylvania Public Utility Commission v. Hidden Valley Utility Services, L.P. – Water (General Rate Increase Filed Pursuant to 66 PS. CS 1308, Including Answers to 52 PA. Code 53.52)*, April 2018, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding the reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. P-2015-2497267. *Petition of Duquesne Light Company for Approval of its Smart Meter Procurement and Installation Plan*, February 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding the inclusion of additional costs related to the Plan's implementation.

Before the Pennsylvania Public Utilities Commission, Docket No. M-2015-2477174. *Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase II of its Energy Efficiency and Conservation Plan*, February 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of proposed Plan. (Case settled prior to cross-examination.)

EXPERT TESTIMONY (continued)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2015-2515642. *Petition of PPL Electric Utilities for Approval of its Energy Efficiency and Conservation Phase II Plan*, January 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2015-2515375. *Petition of Duquesne Light Company for Approval of its Energy Efficiency and Conservation Phase II Plan*, January 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Public Utilities Commission of Rhode Island, Docket No. 4595. *Newport Water Division – Rate Application to Collect Additional Revenues of \$1,304,595 for a Total Cost of Service of \$20,151,440*, December 2015, on behalf of the Division of Public Utilities and Carriers. Testified regarding reasonableness of the overall rate revenue increase.

Before the Maryland Public Service Commission, Case No. 9311. *In the Matter of the Application of Potomac Electric Power Company for an Increase in its Retail Rates For the Distribution of Electric Energy*, April 2013, on behalf of the Maryland Public Service Commission Staff. Testified regarding the inclusion of advanced metering infrastructure meters and energy advisor and engineer positions in rates.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Electric Utilities	:	
Corporation for Approval of its Act 129	:	Docket No. M-2025-3057329
Phase V Energy Efficiency and	:	
Conservation Plan	:	
	:	

VERIFICATION

I, Stacy L. Sherwood, hereby state that the facts set forth in my Direct Testimony, OCA Statement No. 1, are true and correct (or are true and correct to the best of my knowledge, information, and belief) and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

DATED: January 20, 2026

Signature: /s/ Stacy L. Sherwood
Stacy L. Sherwood

Consultant Address: Energy Futures Group
10298 Route 116
Hinesburg, VT 05461

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities	:	
Corporation for Approval of its Act 129	:	Docket No. M-2025-3057329
Phase V Energy Efficiency and	:	
Conservation Plan	:	
	:	

OCA HEARING EXHIBIT 1

**LIST OF EVIDENCE
TO BE MOVED INTO THE EVIDENTIARY RECORD
BY THE OFFICE OF CONSUMER ADVOCATE**

The Office of Consumer Advocate (OCA) intends to submit the following evidence into the evidentiary record in the above captioned proceedings at the scheduled evidentiary hearings in this proceeding.

DIRECT TESTIMONY

- OCA Statement 1: Direct Testimony of Stacy L. Sherwood consisting of written testimony with signed verification of Stacy L. Sherwood, Principal, Energy Futures Group, and the following:
- Attachment A (Witness Qualifications)

ADDITIONAL EXHIBITS

- OCA Hearing Exhibit 1: List of Evidence to be Moved into the Evidentiary Record by the Office of Consumer Advocate (OCA)

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities : Docket No. M-2025-3057329
Corporation for Approval of its Act 129 :
Phase V Energy Efficiency and :
Conservation Plan :

DIRECT TESTIMONY & EXHIBITS

of

ANGELA J. VITULLI

On Behalf of the

Pennsylvania Office of Small Business Advocate

Topics:

**Design and cost-effectiveness of Energy Conservation Programming
for Small C&I**

Date Served: January 20, 2026

Date Submitted for the Record: _____

DIRECT TESTIMONY OF ANGELA J. VITULLI

1. INTRODUCTION AND OVERVIEW

Q. Ms. Vitulli, please state your name and briefly describe your qualifications.

A. My name is Angela Vitulli and I am a Principal at Industrial Economics, Incorporated (“IEc”), a consulting firm located at 2067 Massachusetts Avenue, Cambridge, MA 02140. I am appearing in this proceeding on behalf of the Pennsylvania Office of Small Business Advocate (“OSBA”).

I have testified as an EE&C expert witness on behalf of OSBA in PPL, UGI, and PGW EE&C cases, and in the Columbia Gas Works Green Path Rider case. I am currently serving as the EE&C expert advisor to the New Hampshire OCA. I testified in front of the New Mexico Public Regulation Commission in a recent New Mexico Gas Company M&A case, and I have previously testified for the Public Intervenor of the Province of New Brunswick in an EE&C case.

I have twenty years of experience in energy efficiency and clean energy program design and evaluation. I have served as a principal investigator and contract manager for evaluation contracts for the Department of Energy (“DOE”), and the New York State Energy Research and Development Authority (“NYSERDA”), the California Energy Commission, and the California Air Resources Board. I am currently working on evaluations of multiple heat pump programs for NYSERDA. I have also served as an expert program evaluation advisor to Eversource in Massachusetts, helping the utility with structuring evaluation projects for electric and gas programs, and reviewing results and deliverables.

Finally, I provide greenhouse gas (“GHG”) inventory and strategy services to several private sector and NGO clients. This work entails analyzing the energy use and GHG impacts of organizations and their facilities, and the cost-effectiveness and feasibility of implementing efficiency, fuel switching, and renewable energy measures

I obtained a B.A. degree in Tulane University in Political Science in 1996, *Phi Beta Kappa*, and an M.A. degree Urban and Environmental Policy in 1999, with a concentration in economics. My resume is contained in the Exhibit IEc-1.

Q. Have you previously testified before the Commission?

A. Yes, I have testified as an EE&C expert witness on behalf of OSBA in PPL, UGI, and PGW EE&C cases, and in the Columbia Gas Works Green Path Rider matter.

Q. What is the purpose of this testimony?

A. I was retained by the OSBA to review the Act 129 Phase V Energy Efficiency and Conservation Plan (“Phase V EE&C Plan” or “Phase V Plan”) proposed by PPL Electric Utilities Corporation (“PPL” or “the Company”), and to evaluate whether the Company’s program design is consistent with sound regulatory and economic principles, and would be beneficial, on net, to small business customers. My testimony focuses on traditional energy efficiency programming; my colleague Daniel Kaufman has submitted testimony focused on programming designed to reduce peak demand, as well as solar PV, combined heat and power, and front-of-the-meter programming.

Q. Summarize your current conclusions and recommendations.

A. I recommend that the Commission reject the Proposed Phase V EE&C Plan unless PPL addresses the following:

- **The Commission should require that PPL adjust its energy savings projections for the Small C&I sector to align with the 2025 *Pennsylvania Energy Efficiency and Peak Demand Reduction Market Potential Study*, and correct overreliance on lighting measures.¹ At present:**

- The Company’s lighting-related energy savings projections for this sector are 1.5 times greater than the Potential Study’s estimated remaining savings potential for the Small C&I sector in PPL’s service area.
- Lighting measures account for 56 percent of PPL’s total energy savings for the Small C&I sector.²

¹ NV5 and Brightline Group, *PA Energy Efficiency and Peak Demand Reduction Market Potential Study Report*, January 29, 2025.

² See *Exhibit IEC-3 – Vitulli Workpapers* for calculations

1 As such, Small C&I projected savings do not seem feasible. I discuss this concern in greater
2 detail in Section 4 of my testimony.

3 Should PPL revise its Plan to adequately align energy savings projections with the 2025
4 Market Potential study by reducing reliance on lighting, I would recommend that the
5 Commission approve the revised Plan, with the addition of the following improvements:

- 6 • **The Commission should require PPL to revise the portfolio-wide budget for**
7 **Upstream/Midstream incentives such that the Small C&I sector does not bear**
8 **a disproportionate cost.** Alternatively, the Commission should require PPL to
9 demonstrate that, under the Phase IV Plan, Small C&I customers benefitted from
10 Upstream/Midstream incentives proportional to the Small C&I budget allocated to
11 it.
- 12 • **The Commission should require that PPL provide aggregated program- and**
13 **sector-level participation targets in its Phase V Plan.** The Plan includes tables
14 with projected “participation” by measure. However, these values appear to
15 represent the number of individual measures rather than participating customers
16 (i.e., one customer could receive multiple measures) and are not readily aggregated.
17 As such, I cannot derive projected program- or component-level participation.
- 18 • **The Commission should require that PPL track the number of small business**
19 **participants in the Company’s EE&C programming and include that figure**
20 **in its annual reports.**
- 21 • **The Commission should require that PPL prepare a more detailed plan and**
22 **budget estimate for cross-coordination and braided funding with other**
23 **conservation programs.**
- 24 • **The Commission should require that PPL disaggregate process evaluation**
25 **results for the Non-Residential Program by customer sector, showing breakouts**
26 **for Small C&I and Large C&I.**

27 **Q. How is your testimony organized?**

28 **A.** My testimony is organized as follows:

- First, I discuss the design of PPL’s proposed Phase V EE&C Plan, particularly the elements relevant to the Small C&I sector.
- Second, I summarize PPL’s past performance under its Phase IV EE&C Plan.
- Third, I discuss concerns with aspects of Phase V program design, implementation, and reporting.

2. PROPOSED PHASE V PLAN DESIGN

Q. Is PPL’s proposed Phase V EE&C Plan cost-effective?

A. Yes, the proposed Phase V Plan’s projected portfolio-wide benefit cost ratio (BCR) of 1.67 and the Small C&I sector BCR of 1.65 indicate that both the Plan overall and its small business component are cost-effective.³ However, significant overreliance on lighting underlays this result. Cost-effectiveness will need to be reassessed if PPL updates lighting assumptions and replaces lighting with other measures.

Q. Provide an overview of the proposed Phase V Plan and highlight the Plan components that serve small businesses.

A. PPL’s Phase V Plan includes three programs designed to meet the energy consumption and peak demand reduction targets established for the Company in the Commission’s Phase V Order: the Residential Energy Efficiency Program, the Resource Constrained Energy Efficiency Program, and the Business Energy Efficiency Program. The total portfolio budget is approximately \$308 million, of which \$91.5 million (30 percent) is allocated to the Small C&I sector.⁴ Small C&I customers are primarily served by the Business Energy Efficiency Program, but are eligible to participate in select components of each of the three programs (detailed below):

The **Business Energy Efficiency Program** provides education, technical assistance, and financial incentives for PPL’s Small and Large C&I customers through its Small and Large C&I Business Solutions components. The total budget for the Small C&I component is

³ PPL Proposed Phase V Plan, *Table 3: Portfolio Summary of Lifetime Costs and Benefits of EE&C Plan*, pg. 5.

⁴ The Residential sector is allocated 21 percent of total budget, Resource Constrained is 16 percent, Large C&I is 19 percent, and common costs are 14 percent. See PPL Phase V Plan, *Table 8: Summary of Portfolio Costs*, pg. 15.

\$89.3 million, and the Large C&I component budget is \$58.6 million.⁵ Offerings are largely the same for both components, and include downstream and midstream incentives, custom measures, customer training and certifications, and strategic energy management support.

In addition, PPL will offer a Direct Discount channel exclusively to Small C&I customers, which will allow qualified trade allies to provide lower project costs for customers through an incentive paid directly to the trade ally. PPL also plans to debut a new Business Support Services offering for C&I customers in Phase V, which will provide participants with basic engineering support (e.g., site visits to help determine measure/rebate opportunities, direct support with rebate applications to reduce administrative burden, etc.), as well as deep engineering support where needed (e.g., feasibility studies for custom projects, remote diagnostics to cost-effectively optimize building systems in lieu of onsite visits, etc.).

The **Residential Energy Efficiency Program** (“Residential Program”) is primarily targeted towards PPL’s residential customers, but the Company anticipates that about 1.9 percent (\$1.7 million) of the Small C&I sector budget will flow through this program’s Appliance Recycling component, which targets all residential and C&I customers who may benefit from residential end-use appliance recycling for dehumidifiers, refrigerators/freezers, and air conditioners.⁶

The **Resource Constrained Energy Efficiency Program** (“Resource Constrained Program”) is aligned with the Residential Program in terms of measure and channel delivery but is targeted toward customers at or below 150 percent of the federal poverty level. PPL anticipates that about 0.6 percent (\$549,000) of the Small C&I customer sector’s budget will be allocated to this program through the Student Energy Efficiency Education component, which is open to multifamily building owners/residents who fall within the Small C&I sector.⁷

⁵ PPL Phase V Plan, *Tables 9 and 10: Small and Large C&I Business Solutions Budget by Year*, pgs. 114-115.

⁶ Ibid., *Table 12: Percentages of Customer Sector Budgets Represented by the Residential Energy Efficiency Program*, pg. 25.

⁷ PPL Phase V Plan, *Table 27: Percentages of Customer Sector Budgets Represented by the Resource Constrained Energy Efficiency Program*, pg. 76.

Q. What are the positive attributes of PPL's Phase V Plan for Small C&I customers?

A. The Phase V Plan provides small businesses with the flexibility to participate in the program that best serves their needs. I note the following positive Plan attributes:

- Ample budget dedicated to support Small C&I participation (33.7 percent of total budget).
- Availability of both prescriptive (direct install) offerings and custom (comprehensive) programming, as well as an energy management offering.
- Recognition of this sector's unique needs and participation barriers (e.g., lack of capital, time, awareness, and/or technical expertise required to participate), along with offerings designed to address them, including a Business Support Services offering.
- Programming that encourages electrification and on-site solar installation at small businesses.
- Sub-sector specific offerings for small businesses with unique needs, including agricultural customers and food service businesses with heavy refrigeration use.
- Administrative costs are forecasted at only 13 percent of total Small C&I program costs and 60 percent of all Small C&I spending is allocated to incentives, both of which are efficient uses of ratepayer funds.

3. PAST PERFORMANCE

Q. What is PPL's track record in serving small businesses with its EE&C Plan?

A. Based on PPL's reported Small C&I sector participation, energy savings, and spending under Phase IV to date, the Company has a moderately successful track record in serving small business customers. As of May 31, 2025 (the end of Phase IV Year 4), PPL reports the following achievements:

- **Participation:** 131,973 measures distributed to Small C&I customers to date.⁸

Comparing Phase IV participation to PPL's original projections is difficult, as the Company's Phase IV Plan (revised March 2025) does not include anticipated participation at the program or sector level.⁹ Aggregating the measure-level participation projections for the Small C&I program, I estimate that PPL planned to distribute about 190,130 total measures/incentives to Small C&I sector customers in Phase IV.¹⁰ Thus, the Company has achieved about 69.4 percent of its goal to date, which is about 10 percent behind the 80 percent we might expect by Phase IV Year 4.

- **Energy Savings:** 354,209 MWh saved by Small C&I customers to date.¹¹

This level of energy savings is about 54.9 percent of PPL's revised Phase IV projections, whereas we could reasonably expect the Company to have achieved 80 percent of its target by Year 4 of Phase IV.

I observe that PPL's most recent annual report includes an estimate for *total anticipated* Small C&I energy savings through the end of Phase IV (actual savings to date plus the final year projected pipeline) of 473,210 MWh, which is 73.4 percent of revised Phase IV projections (or 26.6 percent short of the Phase IV goal).¹²

- **Spending:** \$102.7 million spent on the Non-Residential program to date.^{13,14}

⁸ PPL PY 16 Annual Report (Filed September 30, 2025), Table 2-6: Phase IV Summary Statistics by Customer Segment, pg. 12.

⁹ PPL Electric Utilities Corporation Act 129 Phase IV EE&C Plan, Revised March 27, 2025.

¹⁰ Derived by summing projected participation by measure in Table 45: PA PUC Table 8 – Small C&I Efficient Equipment Projected Participation of the PPL Revised Phase IV Plan, pgs. 126-137. See Exhibit IEC-3 – Vitulli Workpapers for calculations.

¹¹ PPL PY 16 Annual Report, Table 2-6: Phase IV Summary Statistics by Customer Segment, pg. 12.

¹² PPL PY 16 Annual Report, Table 5-7: Phase IV Anticipated Total Large and Small C&I Savings, pg. 40.

¹³ Ibid., Table 3-2: Phase IV Program and Portfolio Total Finances, pg. 28.

¹⁴ Note: The PY 16 Annual Report does not break out actual spending to date by customer sector, so this statistic is for the Non-Residential Program as a whole (Small and Large C&I components combined).

This figure represents about 63 percent of the Non-Residential Program's total budget of \$162.8 million. Although spending is slightly behind target, the percent of spending allocated to incentives (69 percent or \$71 million) aligns with plan projections and the highest of all customer sectors.¹⁵

I observe that PPL's most recent annual report breaks out *total anticipated* spending for the Small and Large C&I sectors through the end of Phase IV (actual spending to date plus final year projections). PPL anticipates that Small C&I sector spending will reach 83 percent of projections by the end of Phase IV.¹⁶

Q. What is PPL's track record in evaluating the performance of its EE&C programs, and in particular, the programs that serve small businesses?

A. PPL has conducted impact and process evaluations for all three of its programs implemented under Phase IV, and the Company summarizes all evaluation results in its annual reports. For the Non-Residential Program, which is the primary program for which Small C&I customers are eligible, nearly all program components have been subject to an annual impact evaluation verifying energy savings.¹⁷

Additionally, PPL has completed multiple, comprehensive process evaluations of the Non-Residential Program assessing participant satisfaction, evaluating program successes and barriers, and generating recommendations for improvement. Process evaluation activities have included surveys of distributors, contractors, and end-users, along with in-depth interviews with distributors and administrative staff. The most recent process evaluation (Plan Year 16) found that 91 percent of survey respondents (n = 30) reported satisfaction with their Non-Residential Program experience, similar to results in prior annual reports.¹⁸

However, although PPL's process evaluations suggest that participants are satisfied with the Non-Residential program, I am unable to comment specifically on the experiences of

¹⁵ In the Phase IV Plan, 61 percent of the Residential sector budget is allocated to incentives, 55 percent for the Resource Constrained sector, 69 percent for Small C&I, 66 percent for Large C&I, and 64 percent overall.

¹⁶ PPL PY 16 Annual Report, *Table: 5-9: Phase IV Large and Small C&I Planned Expenditures*, pg. 40. See *Exhibit IEc-3 – Vitulli Workpapers* for calculations.

¹⁷ PPL PY 16 Annual Report, *Table 4-2: Gross Impact Overview*, pg. 31.

¹⁸ *Ibid.*, *Figure 5-1: PY 16 Non-Residential Program Overall Satisfaction*, pg. 42.

small business customers because PPL does not disaggregate process evaluation results by customer sector (e.g., Small C&I and Large C&I).

4. PROGRAM DESIGN, IMPLEMENTATION, AND REPORTING CONCERNS

Q. Are participation targets for the Business Energy Efficiency Program, the Small C&I sector, or small business customers clear in the Phase V Plan?

A. No, they are not. PPL’s Phase V Plan reports that the target market for the Business Energy Efficiency Program is approximately 300,000 customers who may be members of the Small C&I, Large C&I, or Residential sectors (e.g., farmers) who would benefit from rebates on commercial equipment.¹⁹ The Phase V Plan includes projected participation by measure for the Small and Large C&I components, but these projections appear to represent the number of individual measures rather than participating customers (i.e., one customer could receive multiple measures) and are not easily aggregated for the reader to understand projected program- or component-level participation.²⁰

In a response to an OSBA interrogatory, PPL provided a table with this type of aggregation showing that it plans to provide approximately 1.9 million total measures under the Business Energy Efficiency Program (about 1.3 million for the Small C&I sector, 648,000 for Large C&I, and 212 for Residential customers).²¹ Additionally, PPL shared that there are 189,321 “active small businesses” in its service territory, but that the Company does not have a specific forecast for small business participation.²² This information is not included in the publicly available version of PPL’s Phase V Plan.

Q. Does the Phase V Plan allocate incentive costs for the Upstream/Midstream incentives fairly across customer sector?

¹⁹ PPL Phase V Plan, pg. 118.

²⁰ PPL Phase V Plan, *Tables 48 and 49: Small and Large C&I Estimated Savings and Participation*, pgs. 152-289.

²¹ See PPL to OSBA-I-1 Attachment 1.

²² See PPL to OSBA-I-2.

A. Probably not. The Small C&I sector is responsible for 50 percent of the portfolio-wide Upstream/Midstream incentive budget, which is up from 31 percent in Phase IV.^{23,24} This seems like a disproportionate share of Upstream/Midstream incentive costs.

In Phase IV to date, Small C&I customers have comprised only 5 percent of reported program participants.²⁵ In Phase V, PPL projects that Small C&I customers will represent 14 percent of total EE&C program participation.²⁶ Even if PPL can achieve this participation target for Phase V, Small C&I customers shouldering 50 percent of the costs of the midstream program incentives appears disproportionate. Unless PPL can provide evidence that Small C&I customers have received 50 percent of the benefits of Upstream/Midstream programs in the past, the Company should reallocate this budget more equitably.

Q. Does the Phase V Plan clearly describe how PPL will coordinate with other state conservation programs, as emphasized in the Phase V Implementation Order?

A. No, it does not. The Commission's Phase V Implementation Order emphasizes the importance of utilities coordinating with other state conservation programs to "braid" available funding and effectively stack incentives for participating businesses and residential ratepayers.²⁷ The Order specifically identifies the following programs for cross-coordination with the utilities:

- Alternative Energy Portfolio Standards Act (AEPS Act) credits administered by InClimate (with oversight by the PA PUC)
- LIURP and the Low Income Home Energy Assistance Program (LIHEAP)
- HER and HEAR programs managed by the DEP Energy Programs Offices

²³ Phase V Upstream/Midstream incentive budget as a proportion of total incentive budget: Small C&I = 50 percent, Large C&I = 32 percent, Residential = 15 percent, Resource Constrained = 2 percent.

²⁴ See *Exhibit IEC-3 – Vitulli Workpapers* for calculations.

²⁵ PPL PY 16 Annual Report *Table 2-6: Phase IV Summary Statistics by Customer Segment*.

²⁶ See *PPL to OSBA-I-1 Attachment 1* and *Exhibit IEC-3 – Vitulli Workpapers*.

²⁷ Phase V Implementation Order, *Section C: Coordination with Other State Conservation Programs*, pgs. 157-168.

- DEP’s Agricultural Energy Efficiency Rebate Program
- DEP’s Reducing Industrial Sector Emissions in Pennsylvania (RISE PA) Program
- DEP’s Solar for All Program

The Commission also suggests that utilities track any administrative costs incurred to support the braiding of funds. However, PPL’s proposed Plan allocates \$0 for Braided Funding Support Labor cost. The Plan appears to assume that the chosen Conservation Service Provider (CSP) will bear the cost and responsibility for ensuring cross-program coordination and fund braiding, but provides no additional details or direction on how that will occur or be paid for. In response to an OSBA discovery request about the process and schedule for cross-program coordination, PPL simply stated that “The Company is open to coordination at the start of Phase V; if coordination is possible, the Company may continue these efforts as long as external funding exists.”²⁸

Q. Is PPL’s energy savings forecast for the Small C&I rate class realistic and achievable?

A. No, the forecast is not realistic due to its misalignment with the 2025 market potential study and its overreliance on lighting. Lighting measures make up 56 percent of PPL’s total energy savings for the Small C&I sector.²⁹ The market potential study indicates that only 190.2 GWh of potential savings remain from indoor and outdoor lighting for the Small C&I sector within PPL’s service territory due to growing LED saturation in commercial lighting.³⁰ I compared this remaining potential to PPL’s projected lighting savings from prescriptive measures; it totals 279.7 GWh, or 1.5X the remaining lighting savings potential for Small C&I in the PPL service territory.³¹ As such, the Company appears to be grossly overestimating energy savings potential from lighting. For context, 279.7 GWh

²⁸ See *PPL to OSBA-I-7*.

²⁹ See *Exhibit IEc-3 – Vitulli Workpapers*, Lighting Analysis tab.

³⁰ NV5 and Brightline Group, *PA Energy Efficiency and Peak Demand Reduction Market Potential Study Report*, pg. 30, January 29, 2025.

³¹ See *Exhibit IEc-3 – Vitulli Workpapers*, Lighting Analysis tab.

1 represents 90.9 percent of *all* of PPL's remaining Small C&I energy savings potential
2 through 2030 (307.5 GWh).³²

3 The 279.7 GWh does not include Small C&I custom, audit and education, energy
4 management, and retro commissioning programs, which also have some lighting savings
5 baked in, although it is not possible to identify lighting-specific savings from those
6 programs. As such, PPL is actually projecting more than 279.9 GWh savings from lighting,
7 but we do not know how much more.

8 In addition, even if the market potential existed for PPL to rationalize lighting measures
9 comprising 56 percent of its total energy savings target for Small C&I, I am not confident
10 that the Company could get close to achieving 100% of lighting savings potential in this
11 sector. The market potential study indicates that 60 percent of all commercial lighting is
12 already converted to LEDs in the State (with 40 percent remaining unconverted).³³ Further,
13 the 2023 PA Baseline Study indicates that over 80 percent of small businesses in PA
14 already have at least some LED lighting installed.³⁴ As such, PPL will need to target the
15 20 percent of small businesses that have not yet updated any lighting; on the whole, these
16 businesses have high cost barriers to updating lighting and are not inclined to participate
17 in energy efficiency efforts. In addition, PPL will need to target some small businesses that
18 have already made some lighting investments, and convince them to make additional
19 lighting investments that they may have already assessed and decided not to invest in. I am
20 not confident that PPL has an outreach and marketing plan and budget, and incentive levels
21 for lighting, that will attract and convert a high percentage of recalcitrant small businesses
22 to adopt LEDs.

23 **Q. Does this conclude your direct testimony?**

24 **A.** Yes, it does.

³² NV5 and Brightline Group, *PA Energy Efficiency and Peak Demand Reduction Market Potential Study Report*,
pg. 30, January 29, 2025.

³³ Ibid.

³⁴ Demand Side Analytics, 2023 Non-Residential Baseline Study, prepared for the PA PUC, February 2024,
available at: https://www.puc.pa.gov/media/2884/2023_pa_non-residential_baseline_study.pdf

EXHIBIT IEc-1

RÉSUMÉ AND EXPERT TESTIMONY LIST

FOR

ANGELA VITULLI

Overview

Ms. Vitulli has over twenty years of experience in energy program evaluation, and has testified as an expert witness in utility EE&C and M&A cases heard by the PA PUC, NM PRC, and New Brunswick Energy and Utilities Board. She currently services as the EE&C expert advising the New Hampshire OCa. She has extensive experience reviewing EE&C program design and outcomes; applying cost-effectiveness testing to DSM portfolios; and analyzing non-energy benefits in addition to energy conservation outcomes. Ms. Vitulli has managed multi-year, multi-million-dollar contracts to evaluate the impacts of energy efficiency and clean energy programs for NYSERDA, California Energy Commission (CEC), US DOE, and US EPA. She has authorized energy program impact and evaluation frameworks used by CEC, US EPA, UNEP, and the US SBA, and she has also provided evaluation oversight services to Eversource MA. Ms. Vitulli has run workshops and spoken on energy evaluation best practices at the American Evaluation Association and at the International Energy Program Evaluation Conference. She also manages long-term greenhouse gas accounting and energy management projects for several corporate and nonprofit clients, and has practical experience working with clients to implement energy efficiency, renewable power, and fuel switching measures at scale.

Education

Master of Arts in Urban and Environmental Policy, Tufts University
Bachelor of Arts in Political Science, Tulane University, *Phi Beta Kappa*

Select Project Experience

For the **PENNSYLVANIA OFFICE OF THE SMALL BUSINESS ADVOCATE**, the State agency charged with representing the interests of small businesses in utility rate case proceedings, providing expert witness services for multiple proceedings, focused on review of energy efficiency, electrification, and renewable gas programming. This work includes review and analysis of proposed program plans and changes to plan, preparation of testimony and pre-testimony materials, and testifying at utility commission hearings. Served as an expert witness in the matter of the Columbia Gas' proposed Green Path Rider, a proposed program that relied heavily on carbon offsets to reduce greenhouse gas (GHG) emissions associated with gas usage. Assisted OSBA in renewing and analyzing evidence provided by other intervenors. Analyzed the economic and regulatory considerations of the proposed tariff.

For the **NEW MEXICO CENTER FOR CLEAN AFFORDABLE ENERGY**, providing expert witness services for a case proposed sale of the New Mexico Gas distribution system to a private equity firm that has stated intent to expand the utility's residential customer base and data center customer base. Constructed alternative customer acquisition scenarios (for residential and data center customers) based on data provided during discovery to examine the potential impacts of the transaction; Ms. Vitulli focused on greenhouse gas emissions impacts and implications for the ability to meet State economy-wide GHG goals. She will testify at the upcoming PRC hearing on this case in July 2025. Also provided typical case support in terms of drafting and reviewing discovery and assisting with overall case strategy.

For the **NH OFFICE OF THE CONSUMER ADVOCATE**, currently serving as the agency's EE&C expert advisor and assisting the agency with intervening in the NH Saves triennial plan development process to maximize program value for residential ratepayers. Responsibilities include participating in stakeholder meetings and working with the utilities to advocate for important program design features, such as increased on-bill payment options and accessibility, as well as advocating for improvements to C/E testing data sources and assumptions. Ultimately will prepare expert testimony for OCA on the triennial plan, either in support of a settlement, or for delivery to the NH PUC.

For the **NEW BRUNSWICK OFFICE OF THE ATTORNEY GENERAL, PUBLIC INTERVENOR'S OFFICE**, provided expert testimony on Demand Side Management (DSM) investments proposed by the local utility (NB Power) within their general rate application. Conducted analyses of cost-effectiveness and feasibility of the proposed portfolio of residential, commercial, and demand response programming, including comparisons with past performance and benchmarking to similar programs. This included extensive analysis of the customer reach and cost-effectiveness NB Power's dedicated heat pump program and LMI offerings using TRC, a modified societal TRC, and PACT tests. Developed an expert report and testified on behalf of the Public Intervenor's Office at utility commission hearings. Also assisted the Public Intervener in renewing and analyzing evidence provided by other stakeholders.

For **EVERSOURCE**, providing energy efficiency program evaluation oversight and review, including reviewing work plans, methods, and deliverables for market and impact evaluations, with a particular emphasis on methods for non-energy benefits. IEc is providing recommendations to Eversource's evaluation contractors, to improve the technical quality of evaluation designs as well as the communications of evaluation results. Currently, working with evaluation contractors to adopt a formal evidence assessment approach for assessing usability of existing literature for analyzing NEIs, enhancing the rigor and usability of previous literature review approach used for these studies.

For the **CALIFORNIA ENERGY COMMISSION**, managed a multi-year project to develop initial analyses and user-friendly tools to allow the Commission to readily updated analysis of the benefits of the state's large portfolio of energy R&D, demonstration, and deployment grants that are funded by the State's electricity program investment charge (EPIC). Ms. Vitulli was the overall contract manager, as well as the PI for the Advanced Buildings area. Ms. Vitulli managed a Delphi Panel to forecast market uptake of select building energy efficiency technologies in specific building sectors, which allowed us to forecast energy savings, GHG reductions, on-bill savings, and health impacts associated with these investments. At the contract management level, Ms. Vitulli oversaw all of IEc's work to develop a myriad of non-energy benefits methods and tools for EPIC's use, including tools that facilitate analysis of electricity system benefits, public safety benefits, avoided interruption benefits, and health and comfort benefits. IEc worked with the Commission to prepare and package analyses, including non-energy benefits, for inclusion in the program's reauthorization docket and for presentation to stakeholders including regulators, ratepayers, utilities, and the environmental advocacy community. The EPIC program was subsequently reauthorized for five years.

For the **NYSERDA'S PERFORMANCE MANAGEMENT AND EVALUATION DEPARTMENT**, managed a four year contract to evaluate programs within NYSERDA's Technology and Market Development (T&MD) portfolio, which included R&D, demonstration, and market facilitation programs for advanced buildings, smart grid, battery storage, combined heat and power, transportation, and solar diffusion programs. Under this contract, managed evaluations of the Advanced Buildings Program, which funds applied R&D and demonstration projects to help commercialize building level energy efficiency innovations such as next generation HVAC technologies, expansion of LED applications, and integration of controls with HVAC and lighting.

For the **NYSERDA PERFORMANCE MANAGEMENT AND EVALUATION DEPARTMENT**, managing evaluations and development of case studies of deep energy retrofit and electrification programs and pilots, including programs designed to serve low income and disadvantaged populations. These include measuring impacts from NYSERDA's Innovation Market Strategies, Buildings of Excellence, and Comfort Homes programs. Ms. Vitulli is also currently leading the development of a quantitative case study of a pilot project to implement window-mounted heat pumps in public housing in NYC, including studying energy savings, GHG savings, and resident satisfaction with the new technology. These programs are designed to test models for cost-effective electrification, including electrification of multi-family housing. The evaluations and case studies examine and communicate energy use savings, GHG benefits, comfort and IAQ benefits, and other non-energy benefits that accrue to residents and property owners, as well as evaluating economic performance, replicability, and lessons learned to apply to future programming.

For **CALIFORNIA AIR RESOURCES BOARD (CARB)**, conducted an evaluation of economic innovations resulting from AB 32, the State's Global Warming Solutions Act, passed in 2006. The study's purpose is to analyze technology innovation and deployment benefits spurred by key policies and programs enacted in response to AB 32. These include an array of low carbon/electrified transportation, building energy efficiency, industrial decarbonization, and other policies and incentive programs. IEC is investigating how these policies contributed to innovations in varied areas such as development of markets for renewable fuels, electrified buses and trucks, home energy storage, and carbon capture and sequestration.

For **THE UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP) AND THE SUSTAINABLE PURCHASING LEADERSHIP COUNCIL (SPLC)**, co-developed a framework and supporting methodologies to measure sustainable public purchasing benefits and program outcomes including energy, environmental, social, and economic impacts. Conducted research on available methods and tools to assist sustainable procurement programs in estimating impacts. Presented framework and need for better measurement of sustainable procurement policy as plenary speaker at Sustainable Brands: New Metrics in October 2015 and as a session speaker at the Sustainable Purchasing Leadership Council Summit in May 2015. Facilitated UNEP/KEITI expert meeting on benefit measurement from sustainable procurement in Seoul, Korea in November 2015.

For **CalSEED**, California's public seed grant program for climate tech, managed a project to reinvent the program's grantee data collection approach to efficiently collect data needed to forecast economic and environmental benefits from funded companies. Developed Excel calculators that semi-automate estimating GHG mitigation potential for some types of energy efficiency and renewable energy technologies. CalSEED launched the new approach in late 2022, with IEC providing training to incoming and existing grantees. IEC also provides technical support to CalSEED staff and grantees to develop benefits estimation approaches for unique technologies that do not fit within existing methodologies.

For the **PAN AMERICAN HEALTH ORGANIZATION (PAHO)**, conducting a scope 1 and 2 GHG inventory, and measuring select Scope 3 categories, including employee commuting and travel. Previously, conducted a peer review of methodology and modeling for analyzing the GHG footprint from shipping products from suppliers to PAHO member states. Also currently working with PAHO to improve environmental sustainability within the organization's technical cooperation projects and facilitate measurement of environmental impacts. Developed a taxonomy and general framework for measuring the environmental impacts of PAHO technical cooperation activities, based on a review of relevant

frameworks and using a crosswalk with UN SDGs. Developing metrics and methods for measuring environmental impacts, and piloting them with proof-of-concept projects.

For **DAIRY MANAGEMENT INC.**, US dairy's trade association, Ms. Vitulli is leading a project to develop a strategy and roadmap to move the dairy industry towards carbon neutrality by 2050. IEc's subcontractor, LEIF, developed spatially explicit process-LCA model that estimates baseline GHG emissions at the industry level from cradle-to-processor, and examines spatially explicit opportunities for GHG mitigation/decarbonization across key inputs and strategies. Ms. Vitulli developed cost-effectiveness modeling for upwards of 30 specific strategies targeting enteric emissions and emissions from feed production, manure management, on-farm energy use, processing, and transportation, factoring in national subsidies and incentives. We synthesized GHG mitigation potential and economic modeling findings to develop a GHG reduction roadmap communicating a recommended suite of strategies to reduce emissions and improve sustainability within the dairy industry.

For **AEA INVESTORS**, a private equity leader, managing measuring and reporting the GHG footprint and related measures of their mid-market investment portfolio, which includes portfolio companies (portcos) with facilities in over 30 countries. IEc measures their Scope 1 and 2 GHG footprint annually, and developed an auditable process map of each portco's GHG accounting process. Ms. Vitulli is also managing a standardized process to assist portcos with identifying and analyzing potential GHG mitigation options, including estimating typical GHG mitigation potential, cost-effectiveness, and feasibility.

Testimony and Appearances

Ms. Vitulli has provided testimony or appeared in the following cases and regulatory proceedings:

On behalf of Pennsylvania's Office of Small Business Advocate, submitting testimony before the Pennsylvania Public Utility Commission, regarding EE&C plan review, Petition of UGI Utilities, Inc. – Gas Division for Approval of Phase II of its Energy Efficiency and Conservation Plan, No. M-2024-3048418

On behalf of the Coalition for Clean Affordable Energy, submitting testimony before the New Mexico PRC regarding greenhouse gas emissions implications of a proposed acquisition, Petition by Joint Applicants for Approval to Acquire New Mexico Gas Company by Saturn Utilities Holdco, LLC., No. 24-00266-UT

On behalf of the Coalition for Clean Affordable Energy, submitting testimony before the New Mexico PRC regarding greenhouse gas emissions implications of a proposed acquisition, Petition by Joint Applicants for Approval to Acquire New Mexico Gas Company by Saturn Utilities Holdco, LLC., No. 24-00266-UT

On behalf of Pennsylvania's Office of Small Business Advocate, submitting testimony before the Pennsylvania Public Utility Commission regarding EE&C plan review, Petition of Electric Utilities Corporation for Modification of its Act 129 Phase IV Plan for FY 2024-2026, M-2020-3020824

On behalf of Pennsylvania's Office of Small Business Advocate, submitting testimony before the Pennsylvania Public Utility Commission regarding EE&C plan review, Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2024-2026, No. P-2014-2459362

On behalf of Pennsylvania's Office of Small Business Advocate, submitting testimony before the Pennsylvania Public Utility Commission regarding a proposed green tariff based in a carbon offset model, Petition of Columbia Gas of Pennsylvania, Inc., Supplement No. 343 Proposed Tariff Modifications for Inclusion of the Green Path Rider, No. R-2022-3032167

On behalf of the New Brunswick Public Intervenor, submitting testimony before the New Brunswick Energy and Utilities Board regarding EE&C plan review, Petition by NB Power for Approval of Demand-Side Management Plan for FY 2018/2019 – FY 2020/2021, No. 375

EXHIBIT IE_c-2

REFERENCED INTERROGATORY RESPONSES

PPL to OSBA-I-1, Attachment 1**

PPL to OSBA-I-2

PPL to OSBA-I-5

PPL to OSBA-I-7

**** PPL to OSBA-I-1, Attachment 1 [OSBA I-1 Attachment 1] is in excel format ONLY; therefore, will be served via electronic means ONLY, and will be served simultaneous to service of OSBA Statement No. 1, Direct Testimony of Angela Vitulli ONLY*****

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Office of Small Business Advocate's (OSBA)
Dated December 23, 2025
Docket No. M-2025-3057329

OSBA I-2

(Reference: *PPL Proposed Phase V EE&C Plan*, pg. 118): PPL states that the target market for the Small and Large C&I Business Solutions components is “approximately 300,000 business customers, regardless of industry and sector, as well as residential customers (e.g., those who own farms), and may benefit from business energy efficiency rebates.”

- a. Of the approximately 300,000 business customers targeted under PPL’s C&I programs, about how many are small businesses?
- b. Approximately how many residential customers (e.g., those who own farms) does PPL anticipate qualify to participate in the C&I Business Solutions program?
- c. How many of PPL’s C&I customers are owners of multifamily buildings?
- d. What is PPL’s target for small business participation in the Small C&I Business Solutions component? How many small businesses does PPL plan to support each year under this program?

PPL Electric
Response

- a) There are 189,321 active small businesses in PPL Electric’s service territory as of December 6, 2025.
- b) Approximately 212 participants are forecasted in Phase V. The total number of customers that qualify is not currently known.
- c) The Company does not track multifamily building ownership for C&I customers.
- d) The Company forecasts participation at the sector level and does not have a specific forecast for small businesses.

**PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Office of Small Business Advocate's (OSBA)
Dated December 23, 2025
Docket No. M-2025-3057329**

OSBA I-5

(Reference: PPL Proposed Phase V EE&C Plan, pg. 119): PPL will offer a comprehensive midstream channel with incentives for distributors rather than customers, which will reduce program participation barriers by providing customers with faster access to efficient products.

- a. How many distributors are currently engaged in the midstream offering?
- b. How many small businesses have participated in the midstream channel in Phase IV to date?
- c. How does the midstream channel create benefits for small businesses specifically?

PPL Electric
Response

- a) There are currently 23 distributors engaged in the midstream offering.
- b) Approximately 3,660 small commercial and industrial customers and residential customers with commercial end-use. Small business participation is not directly tracked.
- c) The midstream offering creates benefits for all business customers, including small businesses, by removing the administrative burden of needing to submit a downstream rebate application. All business customers, including small businesses, see reduced costs on efficient products more quickly. This may reduce internal administrative costs for small businesses to participate.

WITNESS: Thomas McAteer

**PPL Electric Utilities Corporation
Response to the Set I Data Requests of
the Office of Small Business Advocate's
(OSBA)**

**Dated December 23,
2025 Docket No. M-
2025-3057329**

OSBA I-7

(Reference: PA PUC Phase V Implementation Order, pg. 158; PPL Proposed Phase V EE&C Plan, pg. 197): The PUC's Phase V Order emphasizes the importance of collaborating with other conservation program administrators given the availability of increased funding outside of Act 129. PPL's plan commits to helping customers take advantage of external incentives if available, including but not limited to other gas and water utility programs, Home Efficiency Rebate (HER) programs, and Home Electrification and Appliance Rebates (HEAR) programs.

- a. Is the list of external programs in "Section 4.4.1 – Collaboration Plans" comprehensive? If not, which other programs does PPL intend to coordinate with during Phase V?
- b. How and on what schedule will this coordination occur?

PPL Electric
Response

- a) The list is not exhaustive; the Company may coordinate with other organizations if there is an opportunity to do so, such as the Weatherization Assistance Program, home repair programs, or others.
- b) Coordination is dependent on the external organization's funding availability. The Company is open to coordination at the start of Phase V; if coordination is possible, the Company may continue these efforts as long as external funding exists.

OSBA WORKPAPERS

For

OSBA Statement No. 1

DIRECT TESTIMONY OF ANGELA VITULLI ***

- Exhibit IEc-3 - Vitulli Workpapers

***** OSBA Workpapers are in excel format ONLY; therefore, will be served via electronic means ONLY, and will be served simultaneous to service of OSBA Statement No. 1, Direct Testimony of Angela Vitulli ONLY*****

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities : **Docket No. M-2025-3057329**
Corporation for Approval of its Act 129 :
Phase V Energy Efficiency and :
Conservation Plan :

VERIFICATION

I, Angela J. Vitulli, hereby state that the facts set forth in the Direct Testimony, labelled OSBA Statement No. 1, with associated Exhibit IEc-1, and Exhibit IEc-2, are true and correct to the best of my knowledge, information, and belief, and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: January 14, 2026

AVitulli

Angela J. Vitulli

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities : Docket No. M-2025-3057329
Corporation for Approval of its Act 129 :
Phase V Energy Efficiency and :
Conservation Plan :

CERTIFICATE OF SERVICE

I hereby certify that true and correct copies of the foregoing have been served via email (*unless otherwise noted below*) upon the following persons, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

The Honorable Emily Farren
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
efarren@pa.gov

The Honorable Steven Haas
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
sthaas@pa.gov

Allison Kaster, Esquire
Director
Bureau of Investigation & Enforcement
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
akaster@pa.gov

David B. MacGregor, Esquire
Megan E. Rulli, Esquire
Post & Schell, P.C.
17 North Second Street 12th Floor
Harrisburg, PA 17101-1601
dmacgregor@postschell.com
mrulli@postschell.com

Katie Kennedy, Esquire
Janna E. Williams, Esquire
Johnathan M. Longhurst, Esquire
PA Office of Consumer Advocate
Forum Place
555 Walnut Street, 5th Floor
Harrisburg, PA 17101
OCAPhaseVPPL25@paoca.org

Devin T. Ryan, Esquire
Post & Schell, P.C.
One Oxford Centre
301 Grant Street, Suite 3010
Pittsburgh, PA 15219
dryan@postschell.com

Kimberly A. Klock, Esquire
Michael J. Shafer, Esquire
PPL Services Corporation
645 Hamilton Street, Suite 700
Allentown, PA 18104
kklock@pplweb.com
mjshafer@pplweb.com

Joseph L. Vullo, Esquire
Burke Vullo Reilly Roberts
1460 Wyoming Avenue
Forty Fort, PA 18704
jlvullo@bvrrlaw.com

Elizabeth R. Marx, Esquire
Levi A. Phillips, Esquire
Ria M. Pereira, Esquire
Lauren N. Berman, Esquire
John W. Sweet, Esquire
Pennsylvania Utility Law Project
118 Locust Street
Harrisburg, PA 17101
pulp@pautilitylawproject.org

Judith D. Cassel, Esquire
Micah R. Bucy, Esquire
Kathryn Read-Fisher, Esquire
HMS Legal LLP
501 Corporate Circle, Suite 302
Harrisburg, PA 17110
jdcassel@hmslegal.com
mrbcy@hmslegal.com
kcr@hmslegal.com

Date: January 20, 2026

Adeolu A. Bakare, Esquire
Victoria A. Geddis, Esquire
McNees Wallace & Nurick LLC
100 Pine Street
P.O. Box 1166
Harrisburg, PA 17108-1166
abakare@mcneeslaw.com
vgeddis@mcneeslaw.com

/s/ Steven C. Gray
Steven C. Gray
Senior Attorney
Assistant Small Business Advocate
Attorney ID No. 77538



COMMONWEALTH OF PENNSYLVANIA

January 20, 2026

The Honorable Emily Farren
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

The Honorable Steven Haas
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

**Re: Petition of PPL Electric Utilities Corporation for Approval of its Act 129 Phase V
Energy Efficiency and Conservation Plan / Docket No. M-2025-3057329**

Dear Judge Farren and Judge Haas:

Enclosed please find the Direct Testimony and Exhibits of Daniel Kaufman, labelled OSBA Statement No. 2, with associated Exhibit IEC-2-1, and Exhibit IEC-2-2, on behalf of the Office of Small Business Advocate ("OSBA"), in the above-referenced proceeding.

As evidenced by the enclosed Certificate of Service, all known parties will be served, as indicated.

If you have any questions, please do not hesitate to contact me.

Sincerely,

/s/ Steven C. Gray

Steven C. Gray
Senior Attorney
Assistant Small Business Advocate
Attorney ID No. 77538

Enclosures

cc: PA PUC Secretary Matthew L. Homsher (Cover Letter & Certificate of Service Only)
Angela Vitulli
Emma Grazier
Daniel Kaufman
Parties of Record

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Electric Utilities : Docket No. M-2025-3057329
Corporation for Approval of its Act 129 :
Phase V Energy Efficiency and :
Conservation Plan :

DIRECT TESTIMONY & EXHIBITS

of

DANIEL J. KAUFMAN

On Behalf of the

Pennsylvania Office of Small Business Advocate

Topics:

Design and cost-effectiveness of demand response, solar PV,
combined heat and power, and front of the
meter programming for Small C&I

Date Served: January 20, 2026

Date Submitted for the Record: _____

DIRECT TESTIMONY OF DANIEL J. KAUFMAN

1 **1. INTRODUCTION AND OVERVIEW**2 **Q. Mr. Kaufman, please state your name and briefly describe your qualifications.**3 A. My name is Daniel Kaufman and I am a Principal at Industrial Economics, Incorporated
4 ("IEc"), a consulting firm located at 2067 Massachusetts Avenue, Cambridge, MA 02140.
5 I am appearing in this proceeding on behalf of the Pennsylvania Office of Small Business
6 Advocate ("OSBA").7 I have twenty years of experience in energy efficiency and clean energy program
8 evaluation. I specialize in evaluating technology innovation, demonstration, pilot, and
9 market transformation programs, and in analyzing program benefits, costs, and return on
10 investment. I have served as a principal investigator for relevant contracts for the
11 Department of Energy ("DOE"), the New York State Energy Research and Development
12 Authority ("NYSERDA"), the Massachusetts Department of Energy Resources, the
13 California Energy Commission ("CEC"), and the California Air Resources Board. I am
14 currently providing expert support on behalf of the New Hampshire Office of the Consumer
15 Advocate in the Public Utilities Commission's Investigation into Distributed Generation. I
16 am also currently working on evaluations of multiple NYSERDA programs and projects,
17 including grid modernization projects that aim to improve energy delivery systems,
18 improve distributed energy resources (DER) interconnection, and unlock grid capacity. I
19 have evaluated large-scale renewable energy projects and programs for NYSERDA and
20 the U.S. Environmental Protection Agency, and developed and implemented peer-
21 reviewed methods to assess the market potential of renewable energy and grid integration
22 technologies for the CEC. For the U.S. Small Business Administration, I have evaluated
23 programs that engage and support small businesses across multiple sectors. For the World
24 Bank Group, I have evaluated programs that support small and medium enterprises in
25 adopting clean and efficient technologies and sustainable business practices.26 I obtained a B.A. degree with a double major in Economics and Politics, *magna cum laude*,
27 from Brandeis University in 2005 and an M.A. degree in International Economics and
28 Finance from Brandeis International Business School in 2006. My resume is contained in
29 Exhibit IEC-2-1.

1 **Q. Have you previously testified before the Commission?**

2 A. No.

3 **Q. What is the purpose of this testimony?**

4 A. I was retained by the OSBA to review the Act 129 Phase V Energy Efficiency and
5 Conservation Plan (“Phase V EE&C Plan” or “Phase V Plan”) proposed by PPL Electric
6 Utilities Corporation (“PPL” or “the Company”), and to evaluate whether the Company’s
7 program design is consistent with sound regulatory and economic principles, and would be
8 beneficial, on net, to small business customers. My testimony focuses on programming
9 designed to reduce peak demand, as well as solar PV, combined heat and power (CHP),
10 and front-of-the-meter (FTM) programming. My colleague Angela Vitulli has submitted
11 testimony focused on traditional energy efficiency programming.

12 **Q. Summarize your current conclusions and recommendations.**

13 A. I recommend that the Commission approve the proposed Phase V EE&C Plan with the
14 addition of the following improvements, assuming that the lighting issue that my colleague,
15 Angela Vitulli, raises in her testimony is addressed as she recommended. The Commission
16 should mandate the following improvements for the Company’s proposed peak demand,
17 CHP, solar PV, and FTM programming:

- 18 • **PPL will revise the design of its proposed Peak Load Shift Pilot to increase**
19 **opportunities for success and SC&I participation.** I provide specific
20 recommendations in Section 2 of my testimony.
- 21 • **PPL will conduct quarterly reviews throughout the Peak Load Shift Pilot to**
22 **support timely analysis and course correction.**
- 23 • **PPL will not provide incentives to participants that use diesel and other fossil**
24 **fuel backup generators during demand response events.**
- 25 • **PPL will clarify its plans for offering time of use (TOU) incentives and**
26 **associated education, communication, and outreach efforts.**
- 27 • **PPL will provide evidence that its Solar PV and CHP targets are achievable**
28 **by addressing the uncertainties raised in Section 3 of my testimony.**

- PPL will include a formal “go/no go” decision in its Conservation Voltage Reduction (CVR) Pilot and specify a spending cap for reaching this decision.
- PPL will assign benefits and costs from the CVR Pilot to the correct rate class(es), consistent with standard practices.

Q. How is your testimony organized?

A. My testimony is organized by program component:

- Section 2 addresses the Company’s proposed peak demand programming.
- Section 3 addresses the Company’s proposed solar PV and CHP programming.
- Section 4 addresses the Company’s proposed front of the meter programming.

Within each section, I address the following topics: First, I summarize the design of the proposed program. Second, I summarize the costs and benefits to ratepayers (particularly small commercial and industrial customers, SC&I) of the proposed program, including opportunities for SC&I participation. Third, I discuss measuring and reporting considerations, if any, for each program.

2. PEAK DEMAND REDUCTION

Q. Provide an overview of the Company’s proposed peak demand reduction programming.

A. The Company’s peak demand reduction programming includes: Persistent Peak Demand Reduction (a component within the Residential Energy Efficiency Program), a C&I Peak Load Shift Pilot for small and large C&I customers, and a Peak Time Rebate Pilot for residential customers. The Company also plans to offer education, communication, and outreach related to available time-of-use (“TOU”) programs, if available, to raise customer awareness and encourage participation. I summarize each element below:

- **Persistent Peak Demand Reduction (Residential):** This component aims to reduce peak electric system demand during defined peak periods using thermostat optimization, managed electric vehicle (“EV”) charging, and battery storage. Participating customer-owned thermostats will receive signals to reduce heating and cooling operation while maintaining occupant comfort during critical peak

hours. Enrolled thermostat customers will not be provided with impact notification, because the participating customers have already opted into the program through their device’s manufacturer.¹ For EV managed charging and battery storage, customers will be informed of program participation requirements prior to enrollment.² Managed EV charging will utilize either utility/Conservation Service Provider (CSP) control or customer-enrolled scheduling to shift EV charging away from peak hours for existing customer-owned vehicles and eligible chargers. Battery storage will enroll existing residential battery systems to participate in demand management through the CSP Distributed Energy Resource Management Systems (“DERMS”) platforms with existing battery partner integrations for customer-owned battery storage systems. A customer may opt out of the component channels at any time without limitation.

- **Peak Load Shift Pilot (Small and Large C&I).** The Company proposes to allocate up to \$1 million for a C&I Peak Load Shift Pilot. The pilot aims to understand if C&I daily load shifting is cost-effective in the Company’s territory, and assess customer experience and cost-effectiveness, to inform a potential expanded program. The Company will recruit a cohort to participate in the pilot “by leveraging existing building management systems, process load control, battery storage, thermal storage, on-site generation, or other methodologies.”³ Participating customers will receive a per KW incentive value. The pilot may run between 12 and 24 months, depending on the final pilot design. Anticipated metrics include customer participation, customer satisfaction, customer utilized product or software viability, and cost-effectiveness. If the pilot is successful, PPL may choose to continue the pilot program, “in alignment with stated Pa PUC directives on plan changes, and with contingency funding.”⁴

¹ PPL Response to OCA-II-3

² Ibid.

³ PPL Phase V EE&C Plan, page 190.

⁴ PPL Phase V EE&C Plan, page 190.

- 1 • **Peak Time Rebate Pilot (Residential).** The Company proposes to allocate up to

2 \$1 million for a Peak Time Rebate (“PTR”) demand response pilot for residential

3 customers. The objective of the pilot is to test the effectiveness of a static, seasonal

4 rebate with a performance bonus. Customer incentive levels have not been

5 determined.⁵ . A key research question is whether a PTR encourages residential

6 customers to shift energy usage away from daily peak periods during both summer

7 and winter seasons. Metrics include customer enrollment by season, customer

8 performance by appliance or equipment, attrition rates, and overall peak demand

9 impacts. The pilot may last up to 24 months. Peak demand reductions from the pilot

10 are forecasted to be approximately 800 kW, but this may change based on the final

11 pilot design. The potential savings are not included in the Plan’s savings forecast

12 due to uncertainty around pilot design and implementation.
- 13 • **TOU rates:** The Company plans to offer education, communication, and outreach

14 related to TOU programs, “if available,” to increase customer awareness and

15 maximize TOU participation.⁶ This includes any potential future TOU customer

16 options. The Company’s stated goal is “to create a complementary environment for

17 Act 129 offerings and Company TOU rates,”⁷ though it does not plan to claim

18 savings on TOU at the outset of Phase V. The Company states that it “reserves the

19 right to add TOU participation incentives in Phase V if it will lead to better

20 customer outcomes based on ongoing customer satisfaction and experience

21 measurements.”⁸

22 Information provided by PPL during the discovery process regarding the current

23 status of TOU programs in its service territory was contradictory: Initially, the

24 Company stated, “There are no currently available time of use offerings”⁹ and “The

⁵ PPL Response to OCA-I-13.

⁶ PPL Phase V EE&C Plan, page 24.

⁷ Ibid.

⁸ Ibid.

⁹ PPL Response to OSBA-I-8.

Company does not plan to offer a TOU program at this time.”¹⁰ However, PPL’s website shows that the Company currently offers a TOU program that “runs from June 1, 2025 to May 31, 2029.”¹¹ When asked to clarify, PPL responded that the Company currently has 1,024 accounts enrolled in the TOU program, of which 44 customers are SC&I.¹² The Company stated that currently enrolled customers will be able to stay in the program through May 31, 2029 and new customers may enroll any time prior to the end of the program.¹³ The Company should clarify whether, and how, it plans to offer education, communication, and outreach efforts around its *existing* TOU program before the Commission approves the Plan.

Q. Briefly, how could participating small business customers benefit from the Company’s peak demand reduction programming?

A. Potential benefits to participating SC&I customers include: energy bill savings, financial incentives, and potentially other benefits. Over time, demand response is expected to benefit all ratepayers through avoided capacity costs and other system-level benefits, including improved grid reliability, deferred investments, and enhanced integration of variable renewable energy resources.

Q. Briefly, what are the potential costs to small business customers?

A. Potential costs to participating SC&I customers include operational disruptions, technology and infrastructure requirements, and behavioral or cultural changes.

Q. Does PPL have recent experience serving small businesses with Peak Demand Reduction programming?

A: No. This is not a reflection on the Company, but rather the different requirements across Act 129 Phases I through V. Demand response programming was included in Phase I, excluded from Phase II, included in Phase III, and excluded from Phase IV. As such, PPL

¹⁰ PPL Response to OCA-I-12.

¹¹ <https://www.pplelectric.com/site/Ways-to-Save/Rates-and-Shopping/Time-of-Use-Plan>

¹² PPL Response to OSBA II-8.

¹³ Ibid.

(and the other EDCs) do not have recent experience implementing demand response programs. Moreover, demand response programming in Phase V is fundamentally different from prior phases. Major differences include, *inter alia*, winter peak demand and daily load shifting on non-holiday weekdays during peak season.

Q. Does the Company’s proposed Peak Demand Reduction programming offer sufficient participation opportunities for SC&I customers?

A. No – but it could, with some refinements to the Plan. The Peak Load Shift Pilot is the only peak demand reduction offering that is targeted toward SC&I customers. Beginning with a small-scale pilot program makes sense given the novelty of daily peak demand reduction programs, including both the summer and winter seasons, in Pennsylvania. Starting with a pilot before spending additional resources to scale up the program is a thoughtful use of Act 129 resources.

However, I am concerned that the proposed pilot, as currently envisioned, will not allow adequate time for expanded small business participation even if the pilot is deemed successful. The Company has stated that the pilot will potentially start June 1, 2027¹⁴ and will run between 12 to 24 months. “At the conclusion of the pilot,” evaluation results will be included in the annual reporting process.¹⁵ If the evaluation concludes that the pilot was successful, and PPL decides to expand the offering, the Company will seek approval for Plan changes and will need to secure additional funding.¹⁶ If the pilot starts in June 2027, runs for 24 months, and is not evaluated until the conclusion of the pilot, I am skeptical that the pilot could be expanded to additional SC&I customers during Phase V. My concerns are reinforced by the projected participation figures in the Company’s Plan, which shows zero (0) SC&I participants in PY18, two (2) SC&I participants in PY19, three (3) SC&I participants in PY20, and zero (0) SC&I participants in PY21 and PY22.¹⁷

¹⁴ PPL Response to OSBA-II-7.

¹⁵ PPL Phase V EE&C Plan, page 190.

¹⁶ PPL Phase V EE&C Plan, page 190.

¹⁷ PPL Phase V EE&C Plan, Table 48. Pa PUC Table 9 – Small C&I Estimated Savings and Participation.

To enhance participation opportunities for SC&I customers, I recommend conducting an evaluation of the pilot no later than 12 months after the start date. If the pilot is 24 months, this would be a midterm evaluation. If the 12-month-evaluation results are promising, PPL would have one extra year to secure approval and funding for an expanded program (compared to waiting 24 months to conduct the evaluation). If results are mixed, PPL would have one year to modify the program design before the pilot is completed. As I discuss below, I also recommend that PPL conduct quarterly reviews of the pilot to support continuous learning and improvement. Lastly, I recommend recruiting a larger number of SC&I participants for the initial pilot, if possible given funding limitations. A larger number of participants would expand SC&I participation opportunities, provide more data points to evaluate the results, and hedge against possible attrition.

Q: Are the Company's targets for the proposed Peak Demand Reduction Pilot realistic?

A: The targets are plausible as a starting point for the pilot. The Company's Plan targets 2.0391 MW summer demand reduction and 2.0391 MW winter demand reduction for SC&I customers, and the same for large C&I customers.¹⁸ During discovery, PPL noted that the savings for demand response were averaged across program years.¹⁹ The Company also stated, "There is no available market research for the daily load shifting for the C&I pilot. The Company requested data from the Company's evaluator CSP and an energy efficiency consultant, and no relevant data was available that could be used to inform the pilot."²⁰

Despite the absence of data to inform the targets, I am cautiously optimistic that the stated targets can be achieved. First, the Company is proposing a thoughtful, data-driven approach to identify and recruit participants. Specifically, the Company will analyze interval meter data to identify customers with recurring peak-period loads and operational flexibility and conduct outreach to potential participants. PPL also plans to develop customer-specific

¹⁸ PPL Phase V EE&C Plan, Table 48. Pa PUC Table 9 – Small C&I Estimated Savings and Participation and Table 49. Pa PUC Table 9 – Large C&I Estimated Savings and Participation.

¹⁹ PPL Response to OSBA IR II-6.

²⁰ Ibid.

load shifting strategies for participants.²¹ Second, the proposed level of incentives is a reasonable starting point for recruiting participants and keeping them engaged. Participants will receive up to \$100 per kW, up to \$100,000 per participant.²² Third, although the evaluation plan for the pilot has not yet been developed, indicated that it has access to interval meter data – which is commonly used to evaluate demand response programs – and indicated that additional data may include site verification of technology used, data loggers, and survey and interview data.²³ Overall, Company’s data-driven approach, coupled with customer-focused design and feedback, is supportive of achieving the intended demand reductions and answering the research questions posed for the pilot.

Q: Do you see any possible risks or adverse effects from incentivizing demand response?

A: Yes. In the *Phase V Demand Response Potential Study*, Pennsylvania’s Statewide Evaluator reported, “Much of the C&I DR registered at PJM and acquired by the EDCs in prior Act 129 phases involves significant curtailment of energy intensive operations or activation of behind-the-meter generators (typically diesel-powered).”²⁴ In Phase V, Act 129 peak demand reductions will not be recognized in the PJM market and therefore are not directly transferrable to Phase V programming. Still, in the absence of Pennsylvania-specific data for the Phase V program design, PJM data can provide a rough proxy for how C&I customers might respond to demand events. PJM’s demand response data for the 2024/2025 Delivery Year shows that 1,057.6 MW of the 7,215.5 nominated MW in the PJM market (14.7 percent) used onsite generation. Of the 1,057.6 MW, 84.1 percent used diesel and 15.9 percent used natural gas, gasoline, oil, propane or waste products.²⁵

Diesel and other fossil fuels create significant local air pollution and have negative environmental impacts. Furthermore, as the Commission noted in its Phase V Implementation Order, battery storage is a growing opportunity for peak demand

²¹ PPL Response to OSBA-II-7.

²² PPL Phase V EE&C Plan, Table 46. Pa PUC TABLE 8 – Small C&I Eligible Measures.

²³ Ibid.

²⁴ Demand Side Analytics, *Phase V Demand Response Potential Study*. Prepared for the Pennsylvania Public Utility Commission, page 51. February 2025.

²⁵ [2024 State of the Market Report for PJM](#), Table 6-14 and Table 6-15.

management.²⁶ This provides a cleaner alternative to customers who wish to use backup power during a peak demand event. As such, I recommend that the Commission exclude diesel and other fossil fuel backup generators from receiving incentives under the PDR program.

Q: Is the Company's proposed demand response programming cost-effective?

A. Overall, yes. The benefit-cost ratio for Demand Response programs is 1.07, which indicates that the program overall is cost-effective.²⁷ However, I cannot confirm whether the Peak Load Shift Pilot, specifically, is cost-effective because the Plan does not report benefit-cost ratios at this level of detail.

Q. Are you confident in PPL's ability to measure and evaluate its demand response programs?

Somewhat, but not entirely. The Company's existing access to customer interval data is a good start, but crucial details still need to be worked out. For example, as the Commission noted in its Implementation Order, measuring impacts from daily load shifting programs is challenging because there are no adjacent non-event days to use as a baseline.²⁸ Furthermore, the Commission acknowledged that "the demand response measures in the 2026 TRM do not provide sufficient guidance to EDCs, CSPs, and evaluation contractors regarding the measurement of daily load shifting program impacts," further stating: "If one or more EDC elects to propose a daily load-shifting program in its Phase V EE&C plan, we will direct the SWE to update the Pennsylvania Evaluation Framework with specific M&V guidance for the type(s) of programs proposed. EDCs are also encouraged to prepare Interim Measure Protocols for review and approval by the SWE at any time to promote alignment on estimation techniques."²⁹

²⁶ Pennsylvania Public Utility Commission, Energy Efficiency and Conservation Program Implementation Order, Order, M-2025-3052826, page 118. June 18, 2025.

²⁷ PPL Phase V EE&C Plan, Table 58. Pa PUC Table 15 – Portfolio Summary of Lifetime Costs and Benefits by Category.

²⁸ Final Implementation Order, page 94.

²⁹ Final Implementation Order, page 157.

An additional measurement complication arises if customers that participate in the Company's demand response initiatives simultaneously participate in TOU rate programs. A TOU rate can encourage customers to shift their energy use from peak periods to off-peak periods; while desirable from a societal perspective, this can also significantly complicate evaluation efforts that aim to isolate the impact of other interventions (e.g., peak load shift incentives, managed charging, etc.) from the effects of TOU rates. As I discussed earlier in my testimony, the extent to which the Company plans to offer and encourage customers to participate in TOU rates during Phase V is unclear. The Company should be mindful of possible overlap between programs and design its measurement protocols accordingly.

Finally, given the "pilot" status of the Company's proposed peak load shift offering for C&I customers, I recommend that the Commission require PPL to conduct quarterly reviews to collect customer feedback and analyze the relevant data. The reviews should emphasize learning and adaptive management, with the purpose of integrating near real-time analysis into program design and implementation. This "near real-time" evaluation approach has been used effectively in other states.³⁰ The Commission should require these reviews, in addition to the traditional evaluations conducted by the Company's evaluation contractor, before approving the Plan.

3. SOLAR PV AND COMBINED HEAT AND POWER

Q: Provide an overview of the Company's proposed Solar PV programming.

A: The Company's Plan includes solar PV measures, mostly for C&I participants. Specifically, it includes 219 SC&I participants and 42 large C&I participants.³¹ The Company does not plan to offer residential solar at the outset of Phase V though may in future program years.³² The plan targets reductions of 33.36 MW in summer demand

³⁰ For example, see Archie Kinnane, D. Nilsson, and Emmet Blau, *Real-Time Results, Real-Time Strategy: Creating a Process for Continuous, Data-Driven Feedback on a Residential Energy Efficiency Program in New York State*. 2025 International Energy Program Evaluation Conference. https://www.iepec.org/wp-content/uploads/2025/09/Nilsson_Dana.pdf. September 2025.

³¹ PPL Phase V EE&C Plan, Table 48. Pa PUC Table 9 – Small C&I Estimated Savings and Participation and Table 49. Pa PUC Table 9 – Large C&I Estimated Savings and Participation.

³² PPL Response to OCA-I-12.

(16.32 MW S C&I plus 17.04 MW large C&I) and 5.2 MW in winter demand (2.54 MW SC&I plus 2.66 large C&I), and total energy savings of 95,706 MWh (46,553 MWh SC&I plus 49,153 MWh large C&I).³³ Solar incentives include up to \$0.75/kWh and/or up to \$2500/kW first year savings.³⁴

Q: Provide an overview of the Company’s proposed CHP programming.

A: The Company is providing CHP as a custom measure to small and large businesses. Specifically, PPL is targeting five (5) CHP projects for SC&I customers and five (5) CHP projects for large C&I customers. The Company observes that “The impact of CHP in this Plan is lower than prior phases and is based on Company forecasts and market research for Phase V. CHP is a legacy measure available in prior phases and will benefit select C&I customers, including agricultural customers looking to install CHP digesters to generate electricity and heat. CHP projects must meet program eligibility, including any TRC requirements, to receive incentives.”³⁵ For small business customers, the Plan targets 22,419.91 MWh in savings, and 2.9005 MW demand reduction during the summer peak and winter peak, over the five years. For large business customers, the Plan targets 37,702.99 MWh in savings, and 5.4039 MW in demand reduction over the summer and winter peak.³⁶ PPL will provide incentives of up to \$0.75/kWh and/or up to \$2500/kW first year savings.³⁷

Q: Does PPL have recent experience serving small C&I customers with Solar PV and CHP?

A: Yes. The market potential study for Phase V explains that solar projects have historically accounted for a small share of reported program savings, but in the second half of Phase

³³ PPL Phase V EE&C Plan, Table 48. Pa PUC Table 9 – Small C&I Estimated Savings and Participation and Table 49. Pa PUC Table 9 – Large C&I Estimated Savings and Participation.

³⁴ PPL Phase V EE&C Plan, Table 46. Pa PUC TABLE 8 – Small C&I Eligible Measures and Table 47. Pa PUC TABLE 8 – Large C&I Eligible Measures.

³⁵ PPL Phase V EE&C Plan, page 23.

³⁶ PPL Phase V EE&C Plan, Table 48. Pa PUC Table 9 – Small C&I Estimated Savings and Participation and Table 49. Pa PUC Table 9 – Large C&I Estimated Savings and Participation.

³⁷ PPL Phase V EE&C Plan, Table 46. Pa PUC TABLE 8 – Small C&I Eligible Measures and Table 47. Pa PUC TABLE 8 – Large C&I Eligible Measures.

IV, there was an increase in the number of participating and planned PV projects. In contrast, actual CHP project development for Phase IV has been significantly below the achievable CHP potential results from the Phase IV market potential study. These trends generally hold true across the EDCs, including but not limited to PPL.³⁸

Q: Are you confident in the Company's ability to achieve the solar PV targets in its Plan?

A: Not entirely. During Phase IV, Solar PV contributed over 109,731 MWh in energy savings.³⁹ The market potential study for Phase V identified approximately 99,600 MWh of solar PV potential in PPL's service territory.⁴⁰ The target for Phase V, 95,706 MWh, is slightly lower than both Phase IV actual performance and Phase V potential. However, PPL's Plan may still be optimistic given the current federal policy and economic environment, including the loss of federal tax credits, tariffs, and inflation. Before the Commission approves the Plan, PPL should clarify how (if at all) the Company adjusted its projections for Phase V to reflect the current policy and economic climate and provide evidence that the Company's projections are feasible.

Q: Are you confident in the Company's ability to achieve the CHP targets in its Plan?

A: Not entirely. During discovery, the Company stated that it did not complete market research on CHP participation; however, "the forecast was provided by the CSP and is based on the historic participation in the territory and CSP proprietary forecasting methodologies."⁴¹ PPL should provide further evidence that its CHP projections are feasible before the Commission approves the Plan.

Q: Is the Company's proposed Solar PV program cost-effective?

³⁸ NV5 and Brightline Group, *Pennsylvania Energy Efficiency and Peak Demand Reduction Market Potential Study Report*, pages 42 and 45.

³⁹ PPL EU Stakeholder Meeting – Energy Efficiency & Conservation, October 23, 2025. Non-Residential Program: Custom, slide 38.

⁴⁰ NV5 and Brightline Group, *Pennsylvania Energy Efficiency and Peak Demand Reduction Market Potential Study Report* slide deck, January 29, 2025, Slide 49.

⁴¹ PPL Response to OCA-I-11.

A: Yes, the proposed benefit-cost ratio of 2.05 indicates that the program is expected to be cost-effective.⁴²

Q: Is the Company's proposed CHP program cost-effective?

A: Yes, the benefit-cost ratio of 1.53 indicates that the proposed program is expected to be cost-effective.⁴³

4. FRONT OF THE METER

Q: Please provide an overview of the Company's proposed FTM program.

A: PPL plans to allocate up to \$1 million for a conservation voltage reduction (CVR) pilot. The goal of the pilot is to create and implement a methodology to reduce energy consumption and peak demand through FTM voltage optimization. Specifically, "A key research question is whether the Company has the existing technology, including substation line tap changers and voltage regulators, to implement a CVR program that is in line with Act 129, as well as evaluate any costs of such equipment."⁴⁴ Metrics include baseline voltage, voltage adjustments, time on versus off, and overall energy impacts. The pilot will last up to 24 months. Due to uncertainties around pilot implementation, the Plan does not project any savings. Any savings attributed to the pilot will account for no more than 10 percent of the total savings of the portfolio.

PPL stated, "Due to the limited nature of the pilot, the Company will focus primarily on circuits feeding residential customers. While not initially expected, if small or large commercial customers benefit, costs will be allocated appropriately, as per the Company's EE&C Plan."⁴⁵ PPL also noted that "The pilot will not be implemented if customer energy

⁴² PPL Phase V EE&C Plan, Table 58. Pa PUC Table 15 – Portfolio Summary of Lifetime Costs and Benefits by Category.

⁴³ Ibid.

⁴⁴ PPL Phase V EE&C Plan, page 75.

⁴⁵ PPL Response to OCA-I-12.

usage reduction is not an expected result.”⁴⁶ The pilot design and evaluation methodology have not yet been developed.

Q: Do you have any recommendations for the CVR pilot?

A: Yes, I do. First, I recommend building an official “go/no go” decision to decide whether the key research question – “whether the Company has the existing technology, including substation line tap changers and voltage regulators, to implement a CVR program that is in line with Act 129” – can be answered, and set a funding cap for reaching a go/no go decision prior to spending up to the full \$1 million. Second, the Company should ensure that benefits and costs incurred during the implementation of the pilot are tracked and assigned to the correct customer class, in line with standard ratemaking practices. This should be a condition for the Commission’s approval of the Plan.

”Q. Does this conclude your direct testimony?

A. Yes, it does.

⁴⁶ PPL Response to SEF-I-1.

EXHIBIT IEc-2-1

RESUME

FOR

DANIEL J. KAUFMAN

DANIEL KAUFMAN**PRINCIPAL**

Daniel Kaufman has over 20 years of experience providing energy-related strategic planning, economic analysis, policy analysis, and program evaluation services on a range of topics including distributed energy resources (DERs), energy efficiency programming, large-scale renewables, and grid modernization. With a strong background in finance and economics, he analyzes the cost-effectiveness of energy programs to inform investment decisions. Mr. Kaufman has provided energy-related consulting services to utilities, state and federal agencies, and international organizations, including the Massachusetts Department of Energy Resources, New York State Energy Research and Development Authority, New Hampshire Office of the Consumer Advocate, Colorado Energy Office, Northwest Energy Efficiency Alliance, California Energy Commission, US Department of Energy, US Environmental Protection Agency, US Small Business Administration, and the World Bank. He has presented his peer-reviewed work to the National Academy of Sciences, American Council for an Energy Efficient Economy, and International Energy Program Evaluation Conference.

Education

Master of Arts in International Economics and Finance, Brandeis School of Business and Economics (2006)
Bachelor of Arts, *magna cum laude*, in Economics and Politics, Brandeis University (2005)

Project Experience

For the **NEW HAMPSHIRE OFFICE OF THE CONSUMER ADVOCATE (NH OCA)**, providing expert support for the NH Public Utilities Commission's Investigation into Distributed Generation in NH (Docket No. IR 25-031). A key issue is ensuring that the current net metering tariff, and any potential future revisions, balance the interests of customer-generators with those of non-net-metered customers by maximizing any net benefits while minimizing negative cost shifts. The current docket builds on previous efforts in NH to understand the benefits and costs of distributed generation and alternative net metering tariffs. Mr. Kaufman conducted a rapid review of previous studies and testimony on net metering policy in NH, reviewed the responses submitted by the utilities and other parties for the current proceeding, and developed and submitted comments on OCA's behalf. Mr. Kaufman's [comments](#) address issues including the value of battery storage, benefits and costs of distributed energy resources in NH, cost shifting across customer classes, and a proposed pilot study on battery storage and time of use rates.

For **NYSERDA**, developed a suite of in-depth case studies on the results of NYSERDA's investments to improve energy delivery systems, improve DER interconnection, and modernize New York State's power grid, including economic, environmental, reliability, and technology transfer benefits. For example, the [Central Hudson's Grid Modernization Investments](#) case study quantifies and monetizes energy cost savings, reliability improvements, and avoided GHG emissions; analyzes the net societal benefit of NYSERDA's investment; and calculates the return on NYSERDA's and the utility's investment. The [Interconnection Technical Working Group](#) case study uses New York Department of Public Service data, and interviews with utilities and DER project developers, to evaluate improvements in DER hosting capacity and reductions in DER interconnection time and cost. [Micatu's Real-Time Voltage Sensors](#) and [Tagup Demonstrations](#) evaluate product development, commercialization, investment, operational efficiency, and reliability outcomes resulting from grid monitoring and predictive analytics technologies.

For the **MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES (DOER)**, managed an impact assessment of the Enterprise Energy Management System, a \$10 million program designed to provide real-time energy monitoring data

for publicly owned buildings throughout Massachusetts. Estimated energy and GHG reductions, energy cost savings, and cost effectiveness based on both actual and projected building energy consumption data and energy prices. A key focus was to understand how building managers will use EEMS to identify and implement energy-saving opportunities in response to training and outreach provided by DOER.

For the **CONNECTICUT ENERGY EFFICIENCY BOARD**, as a subcontractor to ERS, provided evaluation services for the Connecticut utilities' Strategic Energy Management (SEM) program. Led a literature review and interviews with SEM stakeholders and experts across the country to identify best practices for SEM programs, and contributed to an evaluation design for measuring *ex-ante* and *ex-post* savings estimates. The resulting *SEM Best Practices Report* identifies best practices for data acquisition and for evaluating such a program in Connecticut.

For the **CALIFORNIA AIR RESOURCES BOARD**, directed a study to evaluate the benefits of economic innovations resulting from AB 32, the State's landmark Global Warming Solutions Act. Developed a comprehensive catalogue of AB 32-related policies, and innovations spurred by AB 32, and developed a suite of case studies based on in-depth market research, interviews and survey research with industry stakeholders, and quantitative analysis of energy and non-energy benefits. Each case study includes an in-depth assessment of how AB 32 policies, programs, and incentives supported the innovation. For example, the Small-Scale Energy Storage case study examined how California's support for solar PV adoption, battery storage technology development, net metering policies, and customer incentives facilitated the adoption of small-scale energy storage systems. The Solar Thermal Technology in the Food and Beverage Processing Industry case study analyzed the potential use of solar thermal technology to provide industrial heat. Key study findings were featured in the AB 32 [2022 Scoping Plan Update](#).

For the **CALIFORNIA ENERGY COMMISSION (CEC)**, developed metrics, methods, and tools for [Measuring Innovation Progress to Guide Future Investments](#) in clean energy and energy efficiency technologies designed to benefit the ratepayers of three California investor-owned utilities. Created methods and tools to capture benefits stemming from the CEC's Electric Program Investment Charge (EPIC). In addition, he led a prospective analysis, informed by expert elicitation, of EPIC-funded renewable energy/grid integration technology adoption, avoided system-level costs, and social welfare benefits through 2045.

For the **US DEPARTMENT OF ENERGY (DOE)**, co-managed a [retrospective benefit-cost analysis of Building America](#), a large-scale residential efficiency program. Analyzed energy savings, energy cost savings, and non-energy impacts (e.g., improved health due to reduced emissions) of selected technologies demonstrated by the program. The evaluation presents net economic benefits, environmental benefits, health benefits, and knowledge benefits for the selected technologies, and includes a variety of benefit-cost analyses, including the program's return on investment, net present value, and benefit-cost ratio. Findings showed that Building America's efforts reduced energy costs and improved environmental health by a combined \$875 million over the past 10 years, at a total program cost of \$162 million – a 30.2% internal rate of return on DOE funding.

For the **US EPA**, managed an evaluation of the RE-Powering America's Land Initiative, which promotes renewable energy (RE) development on contaminated lands (CLs). Such projects often include the installation of solar on capped landfills and other brownfields properties. Assessed the Initiative's role in moving the market toward greater consideration of RE projects on CLs; current market barriers to siting RE projects on CLs; the usefulness of the Initiative's resources, tools, and knowledge products in addressing the barriers; and cost implications of siting RE projects on CLs vs. undisturbed lands. Developed a "process roadmap" that illustrates barriers that can arise in each step of the process (and potential solutions) from the perspective of developers, agencies, and other parties.

For **NYSERDA**, designed and directed a large-scale survey to assess the impacts of NYSERDA-funded demonstration projects and subsequent replication projects. Surveyed projects in sectors including energy resources, on-site power production, buildings, manufacturing, and transportation. Used survey results and project data to: (1) estimate energy savings, cost savings, sales, and other impacts resulting from NYSERDA-funded demonstrations

and replication projects; (2) characterize the number, scale, and type of replication projects; (3) identify factors that helped or hindered replication; (4) assess the cost-effectiveness of NYSERDA's R&D demonstration portfolio; and (5) evaluate participant satisfaction with NYSERDA's R&D Program. Developed an innovative "contribution index" based on survey responses to estimate net-to-gross ratio for each project.

For **UNITED ILLUMINATING/AVANGRID**, as a subcontractor to Metabolic Consulting, assisted the Business Sustainability Challenge program to develop a measurement and communications framework. Tasks included: building a framework and data management plan; standardizing reporting and communications about the program; measuring initial outcomes; and preparing the program for scalability and replicability. Developed a robust measurement framework and data management plan.

For **CONCORD MUNICIPAL LIGHT PLANT (CMLP)**, provided consulting services, as a subcontractor to Optimal Energy, to develop a strategic plan that can deliver on the municipality's ambitious decarbonization goals while maintaining CMLP as a financially healthy business. The team facilitated a goal-setting process to reflect business and environmental concerns and developed quantitative targets for each goal. Identified strategic initiatives that can achieve CMLP's goals (e.g., strategic electrification, energy efficiency programs, utility scale storage, etc.), conducted research into models used by other utilities, developed case studies on promising models/examples, and conducted financial analysis of select initiatives. Developed a "balanced approach" to meet GHG targets with non-emitting PPAs, REC purchases, and a phased set of strategic initiatives, while maximizing CMLP's revenue and net operating income, and controlling rate impacts. Results significantly informed CMLP's [Strategic Plan 2018-25](#).

For **NATURAL RESOURCES CANADA (NRCAN), OFFICE OF ENERGY EFFICIENCY**, provided strategic planning to assist NRCAN in the development of a comprehensive, data-driven approach to energy efficiency programming focused on the built environment, informed by the experience of the US DOE's Building Technologies Office, and underscored by NRCAN's efforts to coordinate cross-border programming with DOE. Assisted NRCAN in adapting BTO's "ecosystem" programmatic approach to implement the continuum of R&D, market stimulation, and codes and standards approaches to drive down energy use intensity of buildings and their components. The study provided recommendations to strengthen internal and external communication, knowledge sharing, and collaboration.

For **NYSERDA**, directing IEC's measurement and evaluation support for seven building decarbonization projects funded by the Innovative Market Strategies (IMS) program. IMS funded projects to test novel, replicable, and scalable approaches to decarbonize New York State buildings. IEC is assessing the value proposition, market scale-up potential, successes, barriers, and lessons learned for each project. Mr. Kaufman is leading the evaluation of a project that engages trusted community institutions (e.g., churches) in building electrification, clean heating/cooling retrofits, and envelope/shell retrofits. Analyzing the energy savings, GHG reductions, and energy cost impacts of the projects. Interviewing the participating institutions and their partners to understand how demonstrations of energy retrofits can showcase benefits, build trust, and inspire more building retrofits throughout the community.

For **NYSERDA**, managing studies of programs designed to advance building decarbonization solutions (Retrofit NY), clean heating/cooling installations (Clean Heat Connect), and large-scale renewables (Build Ready). For RetrofitNY, examining how NYSERDA worked to adopt the Energiesprong approach from the Netherlands to New York State's multifamily affordable housing stock, market evolution, program successes and barriers, and lessons learned about decarbonizing the State's existing building stock. For Clean Heat Connect, examined what resources (and trusted messengers) best assist contractors in promoting electrification through heat pump installations. Conducted in-depth interviews with manufacturers, distributors, and contractors, and deployed a large web-based contractor survey. For Build Ready, documented the program's successes and barriers, and conducted desk research of similar programs to identify promising strategies to overcome barriers and strengthen program processes.

For **NYSERDA**, conducted market research to inform NYSERDA's efforts to support the siting of large-scale renewable energy projects. Conducted a review to document successful siting policies in other jurisdictions in order

to identify promising approaches that could be tailored for New York State. Facilitated focus groups with residents in proposed host site communities for large-scale renewable energy projects to obtain feedback on outreach messages, compensation structures, and outreach strategies. Based on the focus group results, IEc made several specific recommendations on outreach and community compensation, which the Office of Renewable Energy Siting incorporated into the State's Host Community Benefit program.

For the **US SBA**, directed an evaluation of the Community Advantage pilot program. Community Advantage provides loans of up to \$250,000 and aims to fill a gap between SBA's Microloan program and its traditional 7(a) program. A key feature of the program is that SBA works with mission lenders who may offer their borrowers technical assistance and business counseling in addition to financing. This study analyzed the impact of technical assistance and business counseling and the economic outcomes achieved by borrowers, the factors affecting loan performance, and good practices that may be transferable to SBA's other lending programs. The analysis used SBA program data on lenders/borrowers, technical assistance, credit scores, employment data, and detailed loan data. Interviews with program lenders and borrowers provided context for the program data.

For the **US EPA**, co-managed an evaluation of the Climate Showcase Communities (CSC) program. EPA awarded \$20 million to 50 local and tribal governments across the US. to pilot innovative, cost-effective, and replicable models of GHG reductions. The CSCs implemented a range of programs involving energy production, residential and commercial energy efficiency, waste management, transportation, and land use. The evaluation focused on environmental, economic, and sustainability of outcomes; replications of CSC projects by other communities; the cost-effectiveness of the program; and the usefulness of CSC tools and resources.

Select Reports and Publications

Case Studies of [*Central Hudson's Grid Modernization Investments*](#), [*Micatu's Real-Time Voltage Sensors*](#), [*Shared Mobility Network*](#), [*NYSERDA's Workforce Development Program*](#), [*Tagup Demonstrations*](#), and [*Interconnection Technical Working Group*](#), prepared for NYSERDA, July 2020 – September 2024.

[*Measuring Innovation Progress to Guide Future Investments*](#), prepared for the California Energy Commission, December 2020.

[*Evaluation of Building America and Selected Building Energy Codes Program Activities*](#), prepared for the US Department of Energy, March 2018.

Select Speaking Engagements

International Energy Program Evaluation Conference 2025. Panelist, Fueling the Future: Evaluating R&D and Climate Investments. "[*Measuring and Evaluating the Development Impacts of Climate Investments*](#)." Denver, Colorado. October 7, 2025.

International Energy Program Evaluation Conference: Energy Optimization: Evaluation for a Clean & Equitable Future. Panelist, Resiliency and Investments in the Modern Grid. San Diego, California. November 3, 2022.

The National Academies of Sciences, Engineering, and Medicine. Assessment and Advancement of Science in the Bureau of Ocean Energy Management's Environmental Studies Program. Presenter, Update on "Evaluating Connections: BOEM Environmental Studies and Assessments." Public Meeting. July 19, 2021.

Behavior, Energy & Climate Change Conference 2019. Panelist, Electrification Session. "Analyzing and Leveraging Social Networks to Transform Markets." Sacramento, California. November 18, 2019.

International Energy Policy & Programme Evaluation Conference. Presenter, "Do Policies Deliver? Research and Innovation Schemes" Seminar. Vienna, Austria. June 25, 2018.

EXHIBIT IE_c-2-2

REFERENCED INTERROGATORY RESPONSES

OCA-I-11
OCA-I-12
OCA-I-13
OCA-II-3
OSBA-I-8
OSBA-II-6
OSBA-II-7
OSBA-II-8
SEF-I-1

OSBA WORKPAPERS

For

OSBA Statement No. 2

DIRECT TESTIMONY OF DANIEL KAUFMAN ***

- Exhibit IEC-3 Kaufman work papers

***** OSBA Workpapers are in excel format ONLY; therefore, will be served via electronic means ONLY, and will be served simultaneous to service of OSBA Statement No. 2, Direct Testimony & Exhibits of Daniel Kaufman ONLY*****

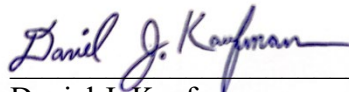
**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of FirstEnergy Pennsylvania : **Docket No. M-2025-3057327**
Electric Company for Approval of a :
Phase V Energy Efficiency and :
Conservation Plan :

VERIFICATION

I, Daniel J. Kaufman, hereby state that the facts set forth in the Direct Testimony and Exhibits, labelled OSBA Statement No. 2, with associated Exhibits IEc-2-1 and IEc-2-2, are true and correct to the best of my knowledge, information, and belief, and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: January 15, 2026



Daniel J. Kaufman

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities : Docket No. M-2025-3057329
Corporation for Approval of its Act 129 :
Phase V Energy Efficiency and :
Conservation Plan :

CERTIFICATE OF SERVICE

I hereby certify that true and correct copies of the foregoing have been served via email (*unless otherwise noted below*) upon the following persons, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

The Honorable Emily Farren
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
efarren@pa.gov

Allison Kaster, Esquire
Director
Bureau of Investigation & Enforcement
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
akaster@pa.gov

Katie Kennedy, Esquire
Janna E. Williams, Esquire
Johnathan M. Longhurst, Esquire
PA Office of Consumer Advocate
Forum Place
555 Walnut Street, 5th Floor
Harrisburg, PA 17101
OCAPhaseVPPL25@paoca.org

Kimberly A. Klock, Esquire
Michael J. Shafer, Esquire
PPL Services Corporation
645 Hamilton Street, Suite 700
Allentown, PA 18104
kklock@pplweb.com
mjshafer@pplweb.com

The Honorable Steven Haas
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
sthaas@pa.gov

David B. MacGregor, Esquire
Megan E. Rulli, Esquire
Post & Schell, P.C.
17 North Second Street 12th Floor
Harrisburg, PA 17101-1601
dmacgregor@postschell.com
mrulli@postschell.com

Devin T. Ryan, Esquire
Post & Schell, P.C.
One Oxford Centre
301 Grant Street, Suite 3010
Pittsburgh, PA 15219
dryan@postschell.com

Joseph L. Vullo, Esquire
Burke Vullo Reilly Roberts
1460 Wyoming Avenue
Forty Fort, PA 18704
jlvullo@bvrrlaw.com

Elizabeth R. Marx, Esquire
Levi A. Phillips, Esquire
Ria M. Pereira, Esquire
Lauren N. Berman, Esquire
John W. Sweet, Esquire
Pennsylvania Utility Law Project
118 Locust Street
Harrisburg, PA 17101
pulp@pautilitylawproject.org

Judith D. Cassel, Esquire
Micah R. Bucy, Esquire
Kathryn Read-Fisher, Esquire
HMS Legal LLP
501 Corporate Circle, Suite 302
Harrisburg, PA 17110
jdcassel@hmslegal.com
mrbcy@hmslegal.com
kcr@hmslegal.com

Date: January 20, 2026

Adeolu A. Bakare, Esquire
Victoria A. Geddis, Esquire
McNees Wallace & Nurick LLC
100 Pine Street
P.O. Box 1166
Harrisburg, PA 17108-1166
abakare@mcneeslaw.com
vgeddis@mcneeslaw.com

/s/ Steven C. Gray
Steven C. Gray
Senior Attorney
Assistant Small Business Advocate
Attorney ID No. 77538

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities : Docket No. M-2025-3057329
Corporation for Approval of its Act 129 :
Phase V Energy Efficiency and :
Conservation Plan :

**OFFICE OF SMALL BUSINESS ADVOCATE'S
ADMITTED
TESTIMONY AND EXHIBITS**

The Office of Small Business Advocate ("OSBA") admitted the enclosed testimony and exhibits, as evidence into the evidentiary record at the Evidentiary Hearing, held on February 3, 2026, in the above-captioned proceeding:

- Direct Testimony and Exhibits of Angela Vitulli, labelled OSBA Statement No. 1, with associated Exhibit IEc-1, and Exhibit IEc-2, with signed Verification of Angela Vitulli.
- Direct Testimony and Exhibits of Daniel Kaufman, labelled OSBA Statement No. 2, with associated Exhibit IEc-2-1, and Exhibit IEc-2-2, with signed Verification of Daniel Kaufman.

Date: February 3, 2026



COMMONWEALTH OF PENNSYLVANIA

January 20, 2026

The Honorable Emily Farren
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

The Honorable Steven Haas
Administrative Law Judge
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

**Re: Petition of PPL Electric Utilities Corporation for Approval of its Act 129 Phase V
Energy Efficiency and Conservation Plan / Docket No. M-2025-3057329**

Dear Judge Farren and Judge Haas:

Enclosed please find the Direct Testimony and Exhibits of Angela Vitulli, labelled OSBA Statement No. 1, with associated Exhibit IEc-1, and Exhibit IEc-2, on behalf of the Office of Small Business Advocate ("OSBA"), in the above-referenced proceeding.

As evidenced by the enclosed Certificate of Service, all known parties will be served, as indicated.

If you have any questions, please do not hesitate to contact me.

Sincerely,

/s/ Steven C. Gray

Steven C. Gray
Senior Attorney
Assistant Small Business Advocate
Attorney ID No. 77538

Enclosures

cc: PA PUC Secretary Matthew L. Homsher (Cover Letter & Certificate of Service only)
Angela Vitulli
Emma Grazier
Daniel Kaufman
Parties of Record

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Energy Company	:	
for Approval of Its Act 129 Phase V	:	Docket No. M-2025-3057329
Energy Efficiency and Conservation Plan	:	

DIRECT TESTIMONY OF JIM GREVATT
ON BEHALF OF
THE COALITION FOR AFFORDABLE UTILITY SERVICES AND
ENERGY EFFICIENCY IN PENNSYLVANIA (CAUSE-PA)

January 20, 2026

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Appendix A: Jim Grevatt Resume and List of Proceedings

Appendix B: Cited Discovery Responses

PREPARED DIRECT TESTIMONY OF JIM GREVATT

I. INTRODUCTION

Q. Please state your name, title, and employer.

A. My name is Jim Grevatt. I am a Managing Consultant at Energy Futures Group, located at 10298 Route 116, Hinesburg, VT 05461.

Q. Please describe Energy Futures Group.

A. EFG is a clean-energy consulting firm headquartered in Hinesburg, Vermont, with offices in New York. EFG designs, implements, and evaluates programs and policies to promote equitable investments in efficiency, renewable energy, other distributed resources, and strategic electrification, with a significant focus on the sufficiency of programs that specifically benefit lower income households and vulnerable communities. EFG staff have delivered projects on behalf of energy regulators, government agencies, utilities, and advocacy organizations in forty states, eight Canadian provinces, and several countries in Europe.

EFG brings to its work a unique combination of technical, economic, program, and policy expertise. EFG staff have critically evaluated hundreds of efficiency and renewable energy programs, playing key roles in developing many that have subsequently won awards for excellence. Recent work involves efficiency program portfolios and policies in each of the fifteen highest-ranking states on the American Council for an Energy-Efficient Economy (ACEEE) State Energy Efficiency Scorecard, as well as in Ontario, Manitoba, and British Columbia. EFG staff have provided expert witness testimony on efficiency programs, integrated resource planning, and related policy issues in regulatory proceedings in twenty states and five Canadian provinces.

1 **Q. Please summarize your professional and educational experience.**

2 A. I have worked in the energy efficiency industry since 1991 in a wide variety of roles. Prior
3 to joining EFG, I served as the Director of Residential Energy Services at Efficiency Vermont and
4 the District of Columbia Sustainable Energy Utility. In both of those roles I oversaw planning and
5 delivery of programs for residential customers including those serving income-qualified
6 households. I also served as the Manager of Energy Services at Vermont Gas Systems, managing
7 both residential and commercial energy efficiency programs. I have extensive hands-on experience
8 conducting hundreds of energy audits for Vermont's Low-Income Weatherization Assistance
9 Program and Vermont Gas Systems' DSM programs.

10 In my current role as Managing Consultant at EFG, I have advised regulators, utilities and
11 other energy efficiency program administrators, environmental organizations, and low-income and
12 affordable housing advocates in over twenty states and Canadian provinces, and I have provided
13 expert witness testimony in fourteen of those jurisdictions. My work, including as an expert
14 witness in litigated proceedings in South Carolina¹ and West Virginia² among others, frequently
15 focuses on the disproportionate energy burdens experienced by lower income households and the
16 sufficiency of utility programs to address those burdens. For example, I co-authored an Energy
17 Efficiency Action Plan for the Southeast Florida Regional Climate Change Compact which
18 provided recommendations to county governments for local and regional actions to increase the

¹ See Direct Testimony of Jim Grevatt on behalf of S.C. Coastal Conservation League, Southern Alliance for Clean Energy, and Voter Solar, Application of Duke Energy Progress, LLC for Increase in Electric Rates, Adjustments in Electric Rate Schedules and Tariffs, and Request for an Accounting Order, Docket No. 2022-254-E, S.C. Pub. Serv. Comm'n (Dec. 1, 2022), <https://dms.psc.sc.gov/Web/Dockets/Detail/118289>.

² See Direct Testimony of Jim Grevatt on behalf of West Virginia Citizen Action Group, Solar United Neighbors, and Energy Efficient West Virginia, Application of Appalachian Power Company and Wheeling Power Company for Review of Energy Efficiency and Demand Response Programs and Approval of Rider Rates, Case No. 24-0332-E-P, W.Va. Pub. Serv. Comm'n (July 10, 2024), <https://www.psc.state.wv.us/scripts/WebDocket/ViewDocument.cfm?CaseActivityID=625266&NotType=WebDocket>.

1 availability of energy efficiency for vulnerable communities in that region.³ I received a B.F.A.
2 from the University of Illinois. My resume, attached as Appendix A, provides additional detail
3 regarding my professional and educational experience.

4 **Q. Have you previously testified in any proceeding before the Pennsylvania Public**
5 **Utilities Commission?**

6 A. Yes, I have testified on behalf of Coalition for Affordable Utility Services and Energy
7 Efficiency in Pennsylvania (CAUSE-PA) in Docket Nos. P-2014-2459362⁴, M-2020-3020820, M-
8 2020-3020821, M-2020-3020822, M-2020-3020823, M-2020-3020818, and M-2020-3020830. I
9 have also testified before utility commissions in Colorado, Florida, Illinois, Iowa, Indiana,
10 Kentucky, Maryland, Nevada, North Carolina, South Carolina, Vermont, Virginia, and West
11 Virginia, as well as in the Canadian provinces of British Columbia and Manitoba.

12 **Q. On whose behalf are you testifying in this case?**

13 A. I am testifying on behalf of the Coalition for Affordable Utility Services and Energy
14 Efficiency in Pennsylvania (CAUSE-PA).

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to offer observations on the portfolio of energy efficiency
17 programs that PPL (PPL or the Company) proposes in hopes that I may inform the Commission's
18 consideration of the Company's Petition. The Company filed a Petition for Approval of its Act 129
19 Phase V Energy Efficiency and Conservation Plan (Phase V Plan or Plan) on December 1, 2025

³ Russell Paez, et al., Energy Efficiency Action Plan (Oct. 21, 2022), https://southeastfloridaclimatecompact.org/wp-content/uploads/2022/12/Energy-Efficiency-Action-Plan_Final2022.pdf.

⁴ I have testified on behalf of CAUSE-PA in Docket No. P-2014-2459362, which includes both the proceedings regarding the Petition of Philadelphia Gas Works for Approval of Demand Side Management Plan for FY 2016-2020, and the Petition of Philadelphia Gas Works for Approval of Demand Side Management Plan for FY 2025-2029.

1 with the Pennsylvania Public Utility Commission (Commission). The Phase V Plan was filed
2 pursuant to the requirements of Act 129 and the Commission's Act 129 Phase V Energy Efficiency
3 and Conservation Implementation Order (Final Implementation Order or FIO), entered on June
4 18, 2025, at Docket No. M-2025-3052826. Specifically, I discuss the sufficiency of the Company's
5 approach to programs that are intended to reduce the energy bills of those customers who lack the
6 financial means to make investments in energy efficiency, i.e. low income households. Throughout
7 this testimony, the term "low income" as applied to persons or households will refer to those
8 individuals and/or households whose income is at or below 150% FPL, consistent with the
9 Commission's definition of that term.⁵

10 **Q. What are your principal observations about the Company's filing?**

11 A. My principal observations are as follows:

- 12 1. The Company's plan consists of three programs: the Residential Energy Efficiency
13 Program (REEP), the Business Energy Efficiency Program (BEEP), and the "Resource
14 Constrained" Energy Efficiency Program (Low-Income) (RCEEP). Each of these broadly
15 framed programs includes several component programs. For REEP these are Energy
16 Efficient Homes, Appliance Recycling, Student Education, and Persistent Peak Demand.
17 BEEP is simply subdivided into Small C&I Business Solutions and Large C&I Business
18 Solutions. Lastly, the Company proposes that RCEEP includes Energy Efficient Homes,
19 Appliance Recycling, and Student Education. However, it is not at all clear that the
20 Appliance Recycling and Student Education subcomponents of RCEEP differ from the

⁵ Phase V Implementation Order at 53-54. There are many households with income above this threshold that also lack adequate means to invest in energy efficiency measures for their home; however, for the purposes of this testimony, I am applying the definition of low income utilized by the Public Utility Commission for the purposes of establishing a low income program sector.

1 general residential offerings in a way that would indicate that they would qualify as
2 “programs solely directed at low-income customers or low-income-verified participants in
3 multifamily housing programs.”⁶

4 2. The Company states it “does not plan to claim savings for income-eligible home energy
5 reports at the beginning of Phase V, though it reserves the right to do so later in the phase,
6 if deemed appropriate.”⁷ As with the Appliance Recycling and Student Education
7 subcomponents of RCEEP, there is no evidence that home energy reports in RCEEP would
8 differ from the general residential offering in a way that would indicate that it would qualify
9 as a program “solely directed at low-income customers or low-income-verified participants
10 in multifamily housing programs.”

11 3. Overall, the Plan is designed to achieve 1,066,059 MWh of savings, more than 20% greater
12 than its target of 828,231 MWh. The Plan similarly projects more savings for the low-
13 income sector than its 65,678 MWh target, with a forecast of 75,623 MWh.

14 4. The Company states that it has “expanded the scope of its low-income EE&C programs by
15 aligning measure and channel delivery with the Residential Program, which keeps the
16 existing participation pathways while expanding options for income-eligible customers.”
17 PPL indicates that this refers to the Appliance Recycling and Student Education
18 subcomponents of RCEEP, as well as the addition of “no-cost measures through the
19 Company's online Marketplace.”⁸ It is my understanding that the Appliance Recycling and
20 Student Education initiatives have been available to low-income customers in Phase IV at

⁶ Phase V Implementation Order at 55.

⁷ PPL Plan, p. 80.

⁸ PPL Response to CAUSE-PA II-17 (a), (All cited discovery responses are attached hereto at Appendix B).

1 no additional cost through the general residential programs rather than as programs that the
 2 Company specifies are directed to low-income customers, therefore it is not clear how the
 3 Phase V offerings would expand offerings for low-income customers.

4 5. The Company also indicates that it “plans to require the CSPs and subcontractors delivering
 5 both the Residential and Resource Constrained Energy Efficiency Programs to be highly
 6 integrated adding to the existing partnerships with the Low-Income Usage Reduction
 7 Program (LIURP) and other assistance programs.”⁹ However, regarding program
 8 coordination, PPL says “[t]he Company does not currently co-fund LIURP and Act 129
 9 EE&C jobs.”¹⁰ It also says that “[s]eparate contractors are used to provide services to
 10 customers for LIURP and Act 129 EE&C activities. The timing of services is not
 11 coordinated as contractor and customer availability, as well as frequency of potential
 12 coordination, make it not feasible.”¹¹ It appears then, that the integration PPL refers to is
 13 the ability for customers to apply for “WRAP” services so that “their eligibility is evaluated
 14 under both the LIURP and Act 129 programs to determine the most appropriate fit.”¹² PPL
 15 proposes only a minimal level of coordination across the various energy efficiency
 16 programs that could benefit its many low-income customers.

17 6. PPL says that “[a]s outlined in the Residential Energy Efficiency Pilot section, PPL Electric
 18 Utilities will allot up to \$1 million for a conservation voltage reduction pilot.”¹³ It states
 19 further that it has “no plans to utilize non-Act 129 funding sources for FTM equipment

⁹ PPL Proposed Phase V EE&C Plan (Plan), p. 4 of 222.

¹⁰ PPL Response to CAUSE-PA I-33 (b).

¹¹ PPL Response to CAUSE-PA I-33 (d).

¹² PPL Response to CAUSE-PA I-30 (a),

¹³ Plan, p.23 of 222.

1 installation” and that “[i]f C&I customers receive benefits based on the circuit, feeder, or
2 other distribution infrastructure utilized, those savings and associated costs will be properly
3 attributed to the correct sector.”¹⁴ In its Tentative Implementation Order (TIO) the
4 Commission proposed “limiting Phase V EE&C Plans to customer-sited measures. While
5 FTM measures may be a prudent investment and lead to desired outcomes, the Commission
6 sees these types of investment as part of operating the distribution system rather than an
7 EE&C Plan component.”¹⁵ The Commission later reversed this position in the FIO, but
8 based on experience in Maryland I believe the Commission had it right in the TIO. What
9 is more, in its Plan, PPL failed to comply with the Commission’s requirements to “[i]nclude
10 the expected contribution to portfolio MWh and MW savings...for FTM measure
11 installation”¹⁶ as outlined in its Phase V Energy Efficiency and Conservation Plan
12 Template.

13 7. The Company asserts that “[a]ll programs offered by PPL Electric Utilities are
14 comprehensive in that they provide incentives for most measures found in the Pa TRM.”¹⁷
15 However, in my experience it is not the number of measures that are included that might
16 make a program comprehensive – rather it is the depth of savings the measures provide and
17 the extent to which those measures are successfully promoted by the program, allowing
18 and encouraging participants to install bundles of measures and thus obtain significant bill
19 reductions. As I will discuss further below, the term comprehensive as used in the context
20 of Act 129 has become nearly meaningless.

¹⁴ Plan, p. 23 of 222.

¹⁵ Phase V Tentative Implementation Order at 30.

¹⁶ Final Phase V EE&C Plan Template, Section 3.1.6.

¹⁷ Plan, p. 24 of 222.

8. In the RCEEP, the Company forecasts that 34% of total portfolio savings for low-income customers will come from general service LED light bulbs, 20% will come from low flow showerheads and faucet aerators, 15% will come from power strips, 7% will come from appliance recycling, 6% will come from water heater temperature setback, and 6% will come from energy saving education.¹⁸ Together these measures comprise 88% of the savings the Company proposes to provide for low-income customers. In contrast, less than one percent of the forecast LI savings will come from ductless heat pumps, barely two-tenths of one percent will come from heat pump water heaters, less than one-tenth of one percent of the Planned LI savings will come from each of window heat pumps, duct sealing and duct insulation, wall insulation, floor insulation, and ceiling/attic insulation.¹⁹ In fact, of the 58 measures proposed for the RCEEP, 45 provide less than 1% of the savings each – and 31 of those provide less than one-tenth of one percent of the savings each.

Q. What are your recommendations for the Commission?

A. My overarching recommendation is that the Commission require the Company to refocus its RCEEP portfolio on deep savings measures, including building shell efficiency and efficient heat pumps and heat pump water heaters. Specifically, I recommend the following:

1. Modify the forecast measure mix for RCEEP such that building insulation and air sealing and efficient heat pumps and heat pump water heaters in aggregate comprise no less than 25% of the low-income portfolio savings for Phase V.
2. Disqualify the proposed resource-constrained Appliance Recycling and Student Education subcomponents and the Home Energy Reports subcomponent of the Energy Efficient

¹⁸ Plan, pp. 90-98 of 222: Table 32. Pa PUC Table 9 – Resourced Constrained Energy Efficient Homes Estimated Savings and Participation.

¹⁹ Id.

Homes component from inclusion towards the low-income savings carve-out. Instead, direct the Company to implement the proposed outreach and marketing strategies within the general residential offering to ensure that low-income participants also have access to these residential program savings.

3. Direct PPL to implement its proposed approach to health and safety measures, including to devote additional funds as needed and available to remediate health and safety barriers to installing deep savings measures for low-income customers.

4. Direct PPL to take the steps necessary to develop the seamless coordination practices I describe on pp. 41-48 and require PPL to file a report of its actions and results along with its first annual report in Phase V and with each subsequent annual report.

5. Reject the vaguely defined proposed Conservation Voltage Reduction pilot as insufficiently researched and conceived, and therefore unlikely to lead to viable savings towards the Act 129 savings requirement. The proposed budget should instead be directed to increasing the installation of deep saving measures in RCEEP.

I discuss my recommendations in detail below.

II. BACKGROUND OF ACT 129 PROGRAMMING

Q. Please summarize the low income energy savings requirements for Phases I, II, III, and IV of Act 129.

A. Act 129 requires that each Electric Distribution Company (EDC) include in its Energy Efficiency and Conservation (EE&C) Plan specific energy efficiency measures for low income households in proportion to that sector's share of the total energy usage in a given service

territory.²⁰ In Phase II, the Commission added a requirement that each EDC obtain a minimum of four-and-a-half percent (4.5%) of its overall consumption reduction requirements from the low-income sector.²¹ To meet the low income consumption reduction target, the Commission allowed EDCs to include all savings achieved through dedicated low-income programs, as well as a portion of savings achieved through non-low income programs based on estimated low income participation.²²

In Phase III, the Commission increased the low-income consumption reduction requirement to five-and-a-half percent (5.5%) of the overall electric consumption savings achieved.²³ The Commission required that “[s]avings counted towards the 5.5% target may only come from specific low-income programs or low-income verified participants in multifamily housing programs.”²⁴ In other words, for Phase III, deemed savings from non-low-income programs were no longer permitted to be counted for compliance with the low income consumption reduction target. In addition to the specific savings carve-out and elimination of the prior deemed savings policy, the Commission further directed that “low-income savings should primarily come from measures that are directly provided to low-income households” – as opposed to upstream rebates or other indirect programming.²⁵

In Phase IV, the Commission increased the percentage of total consumption reduction it required PPL to achieve from the low income sector to 5.8% and maintained its requirement from Phase III that low income savings be derived from programs “solely directed at low-income

²⁰ 66 Pa. C.S. §2806.1(b)(1)(i)(G).

²¹ Phase II Implementation Order at 55, Docket No. M-2012-2289411.

²² Id. at 58.

²³ Phase III Implementation Order at 69, Docket No. M-2014-2424864.

²⁴ Id. at 69.

²⁵ Id.

customers or low-income-verified participants in multifamily housing programs.”²⁶ Notably, however, while the 5.8% savings requirement was higher in terms of the percentage of overall savings, the actual MWh savings requirement from the low income customer segment was lower in Phase IV than in Phase III because the overall portfolio savings targets were lower.²⁷

In Phases II, III, and IV of Act 129, the Commission allowed EDCs to carry over savings achieved in the prior phase that exceeded the overall portfolio and low income consumption reduction targets and apply carried over savings toward savings targets in the subsequent phase.²⁸ The Commission’s permissive carryover policy allowed EDCs to rely on carryover savings to meet their portfolio and low-income savings targets, resulting in EDCs dramatically underspending EE&C program budgets intended to help Pennsylvanians access energy efficiency and conservation measures. The results of Phase III illustrate the impact of the Commission’s carryover policy. EDCs ended Phase III with carryover savings averaging 28% toward their respective Phase IV low income savings targets while over \$149 million dollars intended to be utilized to help Pennsylvanians save energy went unspent.²⁹

Q. Please summarize the low income energy savings requirements for Phase V of Act 129.

For Phase V, the Commission set the percentage of total consumption reduction it requires each EDC to achieve from the low income sector to targets ranging from 6.7% to 7.9%, representing 7.5% of the statewide MWh savings target in aggregate.³⁰ The Commission derived

²⁶ Phase IV Implementation Order at 28, Docket No. M-2020-3015228.

²⁷ Id. at 36.

²⁸ Phase II Implementation Order at 58-60, Docket No. M-2012-2289411; Phase III Implementation Order at 83-86, Docket No. M-2014-2424864; Phase IV Implementation Order at 42-45, Docket No. M-2020-3015228.

²⁹ SWE Final Annual Report Act 129 Program Year 16 (2025) at 8; SWE Phase III Final Report at 50.

³⁰ Phase V Implementation Order at 69.

1 these percentages by “allocating 13% of each EDC’s Act 129 budget to programs solely directed
2 at low-income customers or low-income-verified participants in multifamily housing programs.”³¹
3 The Commission maintained the requirement from Phases III and IV that “[s]avings from non-
4 low-income programs, such as general residential programs, would not be counted toward these
5 targets.”³²

6 Phase V total portfolio savings targets for each EDC are lower than they were in Phase
7 IV.³³ As such, although the Phase V low income savings targets are higher as a *percentage* of
8 overall portfolio savings, the actual MWh low income savings target is again lower in Phase V
9 than it was in Phase IV for all EDCs except for Duquesne Light Company, which had its low-
10 income savings target increased slightly, by 367 MWh.³⁴ For Phase V, the Commission set PPL’s
11 low income savings target at 65,678 MWh, representing 7.9% of the Company’s overall portfolio
12 consumption reduction target.³⁵ Significantly, this is a full 25% less savings than were required in
13 Phase III and the lowest low-income target for PPL since the PUC introduced the low-income
14 target requirement in Phase II:

³¹ Phase V Implementation Order at 69.

³² Id. at 55.

³³ Compare Id. at 48; Phase IV Implementation Order at 18.

³⁴ Phase V Implementation Order at 55, 68.

³⁵ Id. at 55, 68, 48 (65,678 MWh is 7.9% of the final 828,231 MWh Phase V portfolio savings target for PPL).

Table 1: PPL Low Income Target in Each Phase³⁶

Phase	Low-Income Target
Phase II	36,948 MWh
Phase III	87,465 MWh
Phase IV	72,509 MWh
Phase V	65,678 MWh

In its Implementation Order, the Commission also directed the Bureau of Technical Utility Services to “work with the SWE to develop reporting requirements for comprehensive program offerings and whole-home, comprehensive measures for the EDCs’ low-income programs in Phase V.”³⁷ Further, the Commission capped the amount of energy savings achieved during Phase IV that EDCs can carry over and apply toward their Phase V overall and low-income targets to 20% of the Phase V targets.³⁸ The Commission made clear, however, “that EDCs can, and should, design their Phase V plans to meet their Phase V goals without the use of any carryover, as the EEPDR Potential Study indicates Phase V goals are achievable without carryover.”³⁹

³⁶ Phase II Implementation Order at 24, 54, Docket No. M-2012-2289411; Phase III Implementation Order at 63, Docket No. M-2014-2424864; Phase IV Implementation Order at 34, Docket No. M-2020-3015228; Phase V Implementation Order at 55, Docket No. M-2025-3052826.

³⁷ Phase V Implementation Order at 72.

³⁸ Id. at 84, 241.

³⁹ Id. at 85.

III. THE NEED FOR LOW INCOME ENERGY EFFICIENCY

Q. What level of income qualifies a household as “low income”?

A. Generally, the Commission considers a “low income” customer to be any residential customer whose income is at or below 150% of the Federal Poverty Level (FPL).⁴⁰ With some exceptions, most utility assistance programs require households to have income that is not greater than 150% FPL to qualify.⁴¹ Act 129 specifically mandates that EDCs’ EE&C Plans contain specific energy efficiency measures for households at or below 150% FPL.⁴² PPL customers at or below 150% FPL would be eligible for the company’s Resource Constrained Energy Efficiency Program, outlined in its proposed Phase V EE&C Plan, and are eligible for the Low-Income Program under the company’s existing Phase IV EE&C Plan.⁴³

As a baseline, a family of four with a household income at or below 150% FPL has a maximum gross annual income of \$48,225 (\$4,018/month) – while a household of four with income at or below 50% FPL has a maximum gross annual income of just \$16,075 (\$1,340/month).⁴⁴ Table 2 provides a breakdown of the 2025 household income by FPL and household size:

⁴⁰ See 52 Pa. Code § 54.72 (Defining low income customers for the purposes of EDC Universal Service programs and reporting).

⁴¹ See e.g. PPL Universal Service & Energy Conservation Plan, 2023-2027 (PPL USECP 2023-2027) at 2.

⁴² 66 Pa.C.S. 2806.1(b)(1)(i)(G).

⁴³ Plan at 76; PPL Revised Phase IV EE&C Plan (May 24, 2021) at 61.

⁴⁴ See US Dept. of Health & Human Services, HHS Poverty Guidelines for 2025, available at: <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines>.

Table 2: 2025 Federal Poverty Levels by Household Size and Annual Income⁴⁵

Household/Family Size	50%	100%	150%	175%	200%	250%
1	\$7,825	\$15,650	\$23,475	\$27,388	\$31,300	\$39,125
2	\$10,575	\$21,150	\$31,725	\$37,013	\$42,300	\$52,875
3	\$13,325	\$26,650	\$39,975	\$46,638	\$53,300	\$66,625
4	\$16,075	\$32,150	\$48,225	\$56,263	\$64,300	\$80,375
5	\$18,825	\$37,650	\$56,475	\$65,888	\$75,300	\$94,125

Q. How many low-income customers does PPL have?

A. Like other large regulated public utilities in Pennsylvania, PPL must track its low income customer population in two ways: “*estimated low income customers*” and “*confirmed low income customers*.”⁴⁶ The “estimated low-income” customer number is derived using local census data, scaled against residential customer counts in a given geographic area, to approximate the percentage of low-income households in a utility’s service territory.⁴⁷ The “confirmed low-income” number is a count of those customers for whom the Company has obtained information that would reasonably indicate that the customer’s income is at or below 150% of the federal poverty level (FPL).⁴⁸

In 2024, PPL reported 1,267,686 total residential customers, of which 345,414 (27.2%) were estimated low-income and 210,754 (16.6%) were confirmed low-income.⁴⁹

As of December 2025, the average annual income for PPL’s confirmed low-income customers is \$17,103.48.⁵⁰ For all 2024 participants in universal service programs statewide,

⁴⁵ See US Dept. of Health & Human Services, HHS Poverty Guidelines for 2025, available at: <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines>.

⁴⁶ See Pa. PUC, BCS, 2024 Report on Universal Service Programs & Collections Performance (2024 Universal Service Report), at 5-7.

⁴⁷ Id. at 7.

⁴⁸ 2024 Universal Service Report. at 2.

⁴⁹ Id. at 5-7.

⁵⁰ PPL Response to CAUSE-PA III-6.

1 average annual household income for electric customers was \$22,362.⁵¹ The average electric CAP
 2 household (two persons) had an income of \$16,031, which placed these households' incomes at
 3 approximately 78% of the FPL (for two persons) for 2024, and 76% for 2025.⁵² In other words,
 4 the average income of households that are eligible to participate in the low-income programs is
 5 roughly half of the qualifying income level. Electric customers who received LIURP services in
 6 2024 had average annual household incomes of \$21,580.⁵³

7 **Q. How does the cost of energy impact low income households?**

8 A: To contextualize the impact of energy costs on low income households, it is helpful to
 9 understand the relative energy burden shouldered by low income ratepayers as compared to other
 10 Pennsylvanians. A household's energy burden is the percentage of household income required to
 11 pay for energy services.⁵⁴ According to formal Commission policy, to be considered affordable, a
 12 household's combined energy burden (electric and gas) should not exceed 6% of household income
 13 for those with incomes between 0-50% FPL, or 10% of household income for those with income
 14 between 51-150% FPL.⁵⁵ But across Pennsylvania, households with income at or below 150% FPL
 15 spend as much as 30% of their income on energy costs alone.⁵⁶ By comparison, the Bureau of
 16 Consumer Services (BCS) estimates that the energy burden of Pennsylvania's residential
 17 customers as a whole (exclusive of those enrolled in a Customer Assistance Program (CAP)) is
 18 roughly 4%.⁵⁷ The overwhelming energy burdens on low-income households leave families with

⁵¹ 2024 Universal Service Report at 48.

⁵² *Id.* at 51.

⁵³ *Id.* at 48.

⁵⁴ 2019 Amendments to Policy Statement on Customer Assistance Program, 52 Pa. Code § 69.261-69.267, Final Policy Statement and Order, Docket No. M-2019-3012599, (Final Policy Statement entered Nov. 5, 2019) at 3.

⁵⁵ 2019 Amendments to Policy Statement on Customer Assistance Program, 52 Pa. Code § 69.261-69.267, Final Policy Statement and Order, Docket No. M-2019-3012599, (Final Policy Statement entered Nov. 5, 2019).

⁵⁶ See Fisher, Sheehan & Colton, The Home Energy Affordability Gap: Pennsylvania (April 2023),

http://www.homeenergyaffordabilitygap.com/03a_affordabilityData.html.

⁵⁷ Energy Affordability for Low income Customers, Docket No. M-2017-2587711, Order, at 8 (Jan. 17, 2019)

insufficient funds to pay for housing, water costs, food, medicine, childcare, and other basic needs and pose significant obstacles for low income families to afford their monthly bills and stay connected to essential energy services in their homes.

Home energy prices are higher than they have been in a decade, and are projected to continue rising.⁵⁸ Energy insecurity resulting from high energy burdens impacts roughly 1 in 4 Pennsylvania households.⁵⁹ According to the United States Census Bureau's Household Pulse Survey, roughly 24.4% of Pennsylvania households were unable to afford their home energy bills in 2024, compared to 23% nationwide.⁶⁰ Nearly 1 in 20 Pennsylvania households have past-due energy utility debt, with an average overdue balance exceeding \$1,200, far above the national average of \$789.⁶¹ According to the Energy Information Administration (EIA) Residential Energy Consumption Survey (RECS), 33.6% of United States residents reported experiencing energy insecurity; 24.6% reported reducing or forgoing food or medicine to pay for energy costs; and 12.2% reported leaving their homes at unhealthy temperatures because they could not afford to pay for energy.⁶² Energy insecurity is more pronounced for low income Black families. EIA's

⁵⁸ National Energy Assistance Directors Association, Winter Heating Costs Expected to Jump 9.2%, Putting Millions of Families at Risk, (Dec. 12, 2025), <https://neada.org/wp-content/uploads/2025/12/winterheatingdec25PR.pdf>.

⁵⁹ US Census Bureau, Household Pulse Survey: Pennsylvania, Unable to Pay Energy Bill (Aug. 20 – Sept. 16, 2024), https://www.census.gov/data-tools/demo/hhp/#/?measures=ENERGYBILL&s_state=00042. Energy insecurity is the inability to adequately meet home energy needs. There are three dimensions to energy insecurity: economic (disproportionately high energy costs (burden) as percentage of income); physical (housing deficiencies / inefficiencies); and coping (strategies to cope with economic and physical hardships associated with energy insecurity). See Columbia Univ. Ctr. on Global Energy Policy, Energy Insecurity in the United States, <https://www.energypolicy.columbia.edu/publications/energy-insecurity-in-the-united-states/>.

⁶⁰ US Census Bureau, Household Pulse Survey: Pennsylvania, Unable to Pay Energy Bill (April 9-29 2024), available at: https://www.census.gov/data-tools/demo/hhp/#/?measures=ENERGYBILL&s_state=00042.

⁶¹ The Century Foundation, Fueling Debt: How Rising Utility Costs are Overwhelming American Families (Nov. 17, 2025) <https://tcf.org/content/commentary/fueling-debt-how-rising-utility-costs-are-overwhelming-american-families/>.

⁶² United States Energy Information Administration, 2020 Residential Energy Consumptions Survey, Table HC11.1 Household energy insecurity, 2020 available at: <https://www.eia.gov/consumption/residential/data/2020/hc/pdf/HC%2011.1.pdf>.

1 RECS data revealed that 52% of Black and African American households experience energy
 2 insecurity, compared to 23.2% of white households.⁶³

3 According to a recent study of the National Energy Assistance Directors Association and
 4 the Center for Energy Poverty and Climate, in February 2024, 51.9% of households with income
 5 under \$50,000 reported at least one month where they reduced or went without food, medicine,
 6 and other basic needs in order to pay an energy bill.⁶⁴ In addition, 34% kept their home at a
 7 temperature that felt unsafe or unhealthy in order to save money on energy bills.⁶⁵ The data
 8 reviewed in the study found that, far and away, the greatest increase in energy insecurity in 2024
 9 was among households with children.⁶⁶ As recent research and data has continually showed,
 10 vulnerable low-income families simply cannot afford the cost of energy services.

11 **Q. Is there other evidence that the Company's low-income customers struggle to afford**
 12 **electricity service?**

13 A. Yes. The Commission's Universal Service Reports show that the Company's confirmed
 14 low-income customers are terminated for nonpayment at nearly four times the rate of residential
 15 customers overall. In 2024, the termination rate for the Company's residential customers was 5.3%,
 16 but for confirmed low-income customers the termination rate was a staggering 20.0%.⁶⁷ One out
 17 of every five of PPL's confirmed low-income customers faced involuntary termination of
 18 electricity service in 2024.⁶⁸ Confirmed low-income customers are also more likely to be payment

⁶³ U.S. Energy Information Admin.(EIA), In 2020, 27% of U.S. households had difficulty meeting their energy need, available at: <https://www.eia.gov/todayinenergy/detail.php?id=51979>.

⁶⁴ Nat'l Energy Assistance Dir. Assoc. (NEADA), Center for Energy Poverty & Climate, Energy Hardship Report, slide 10 (April 2024), available at: <https://neada.org/wp-content/uploads/2024/04/neadahardshipreportAPR24.pdf>.

⁶⁵ Id.

⁶⁶ Id.

⁶⁷ 2024 Universal Service Report at 11-12.

⁶⁸ Id.

troubled. Despite making up only 16.6% of residential customers, confirmed low-income customers make up 61.4% of payment arrangements and 57.1% of payment troubled customers (defined as failing to maintain at least one payment arrangement).⁶⁹

Q. What are the consequences of utility termination for low-income households?

A. Utility termination has severe, destabilizing impacts on low-income households. Involuntary loss of electricity has a deep and lasting impact on the health and well-being of an entire household – as well as the community. The loss of electric service can often mean that a household is unable to use their primary heating source in the winter, even if that heating source is non-electric. When a household is unable to use a primary or secondary heating system, their heating system is inadequate, or the home is poorly insulated, they often resort to dangerous and/or high-cost heating, cooking, and lighting alternatives – such as the use of alternate fuels or portable generators – which increases the risk of carbon monoxide poisoning and home fires.

The loss of electric service can also have a significant impact on the ability of vulnerable populations to manage medical conditions and is particularly dangerous for certain groups – including seniors, families with young children, and individuals with a disability – each of whom are more likely than other residential households to experience poverty and income insecurity.⁷⁰ Furthermore, utility insecurity and resulting payment trouble is increasingly recognized as a

⁶⁹ 2024 Universal Service Report at 6, 10, 8.

⁷⁰ Charlie Harak, Olivia Wein, NCLC, Protecting Seriously Ill Consumers from Utility Disconnections: What States Can Do to Save Lives Now (Sept. 29 2022), at 5-6, available at: <https://www.nclc.org/resources/report-protecting-seriously-ill-consumers-from-utility-disconnections-what-states-can-do-to-save-lives-now/>.

1 predictor of first-time homelessness.⁷¹ Involuntary loss of electric service is often a contributing
 2 factor leading to family separation through the child welfare system.⁷²

3 **Q. Does the Company's customer assistance program (CAP) alleviate these struggles?**

4 A. CAP helps; however, CAP only reaches a small percentage of eligible customers. In 2024,
 5 only 74,564 of the Company's customers were enrolled in CAP – this is just 35.4% of confirmed
 6 low-income customers and 21.2% of estimated low-income customers.⁷³ Thus, as much as 78.8%
 7 of low-income customers are not enrolled in CAP and are charged the full residential rate.

8 Further, PPL limits the amount of assistance provided each year to any one CAP customer
 9 by applying a maximum CAP credit limit.⁷⁴ CAP credits are the difference between the CAP rate
 10 and the full residential tariff rate. Customers that expend their maximum CAP credit within a 12-
 11 month period are transitioned into OnTrack Budget Billing (OTBB) and must pay the full tariff
 12 rate until their credit resets at the next 12-month program period.⁷⁵ A significant number of PPL's
 13 CAP customers exceed their CAP maximum credit limits each year and face categorically
 14 unaffordable bills and disproportionate termination rates. In 2024, 11,754 CAP customers (15.8%
 15 of CAP customers reported that year⁷⁶) exceeded their maximum CAP credits and faced higher
 16 rates when they were moved to OTBB.⁷⁷ During that year, 2,667 CAP customers were terminated

⁷¹ Colin Middleton, Kim Boynton, David Lewis & Andrew M. Oster, The Value of Utility Payment History in Predicting Homelessness, PLOS (Oct. 9, 2023), available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0292305>.

⁷² Comments of Cynthia Figueroa, Commissioner, Philadelphia Dept. of Human Services, Review of Universal Service and Energy Conservation Programs, Pa. PUC Docket No. M-2017-2596907 (Aug. 8, 2017).

⁷³ 2024 Universal Service Report at 56, 7.

⁷⁴ PPL USECP 2023-2027 at 13-14.

⁷⁵ Id. at 5, 14.

⁷⁶ 2024 Universal Service Report at 56 (PPL reported 74,564 CAP participants in 2024).

⁷⁷ PPL Response to CAUSE-PA IV-2(a), Attachment 1.

for nonpayment after exceeding their maximum CAP credit limits, amounting to a 22% termination rate.⁷⁸

Q. What is the relationship between energy efficiency and CAP?

A. CAP costs are recovered through a rider assessed to all residential customers; thus, lowering energy costs for CAP participants helps reduce their CAP credits, which, in turn, helps reduce terminations and brings down the cost of service for other ratepayers.⁷⁹ The Commission has acknowledged the financial savings potential available through low-income energy efficiency improvements, stating in its 2026 TRC Test Final Order that:

Utilities can realize financial savings from their low-income EE programs. The efficient technologies installed by EE programs often result in reduced energy bills for participants, which can decrease the likelihood that customers will experience difficulties paying their utility bills. In turn, utilities may realize reduced costs associated with arrearages and late payments, uncollectible bills and bad debt write-offs, service terminations and reconnections, bill-related customer calls, and the bill collections process.⁸⁰

Energy efficiency enables CAP customers to reduce their usage and thereby reduce the amount of CAP credit utilized each month. Providing comprehensive and effective EE&C programing to CAP customers helps them to afford their bill and helps control costs for all ratepayers. The greater the energy savings is in each participating household, the greater the cost savings in reduced CAP expenditures will be for the customer base as a whole.

Q. What is the relationship between poverty and home energy efficiency?

A. Energy insecurity is rooted in the interconnection of poverty and housing deficiencies.⁸¹ Low-income consumers are far more likely to live in aging, inefficient, and potentially unsafe

⁷⁸ PPL Response to CAUSE-PA IV-2(d), Attachment 1.

⁷⁹ PPL Tariff Electric Pa. P.U.C. No. 201 (Supp. No. 316) at 16th Revised Page No. 14D.

⁸⁰ 2026 TRC Test Final Order at 56.

⁸¹ Hernandez, Diana, Energy Insecurity and Health: America's Hidden Hardship, Health Affairs Health Policy Brief, June 29, 2023. <https://www.healthaffairs.org/doi/10.1377/hpb20230518.472953/>.

housing.⁸² Low-income consumers are more likely to live in housing with poor quality insulation or no insulation at all.⁸³ Many low-income households are unable to afford the costs of repairs and improvements necessary to stem high consumption as a result of inefficiencies or other factors in their homes. As a result, households that experience energy insecurity spend 26.5% more per square foot on energy costs than households that do not experience energy insecurity.⁸⁴ Remediating housing deficiencies, such as health and safety barriers, is thus critical to ensuring the effective delivery of energy efficiency improvements to low-income households.

Further, the intersection of poverty and racism produces a pronounced disparity in energy burdens across low-income communities of color, driven primarily by historic inequities in housing and community investment.⁸⁵ Census tracts with higher concentrations of Black households have disproportionately high energy use intensity, reflective of the greater energy inefficiency of housing in these areas.⁸⁶ Housing in predominantly Black neighborhoods is less energy efficient than housing in predominantly white neighborhoods because of the legacy of

⁸² American Council for an Energy-Efficient Economy, *Study: One in Four Low-Income Households Spend Over 15% of Income on Energy Bills* (Sep. 11, 2024) <https://www.aceee.org/press-release/2024/09/study-one-four-low-income-households-spend-over-15-income-energy-bills>.

⁸³ Nat'l Energy Assistance Directors' Ass'n (NEADA), *Energy Hardship Report* at 16 (Aug. 2024). <https://neada.org/wp-content/uploads/2024/08/August-Summer-Hardship-Report-Final.pdf>.

⁸⁴ U.S. Energy Information Administration, *U.S. Energy Insecure Households were Billed More for Energy Than Other Households* (May 30, 2023). <https://www.eia.gov/todayinenergy/detail.php?id=56640>.

⁸⁵ Stephens, H., Donoghoe, M., and Perry, A.M., *How Extreme Heat Threatens Black Renters, and What Policymakers Can do to Fix It* (Sept. 6, 2023) <https://www.brookings.edu/articles/how-extreme-heat-threatens-black-renters-and-what-policymakers-can-do-to-fix-it>, see also Carolyn B. Swope, Diana Hernández, *Housing as a Determinant of Health Equity: A Conceptual Model*, SOCIAL SCIENCE & MEDICINE, vol. 243 (Dec. 2019), <https://www.sciencedirect.com/science/article/pii/S0277953619305659>.

⁸⁶ Hernandez, Diana, *Energy Insecurity and Health: America's Hidden Hardship*, Health Affairs Health Policy Brief, June 29, 2023. <https://www.healthaffairs.org/doi/10.1377/hpb20230518.472953/>.

discriminatory housing and development policies, such as redlining, which drove decades of disinvestment.⁸⁷

Q. Does the Company's Low Income Usage Reduction Program (LIURP) satisfy the need for low income energy efficiency programming?

A. LIURP is a vital program, but it cannot, by itself, satisfy the need for low income energy efficiency programming. While there are substantial similarities between Act 129 and LIURP, each of the two programs provides distinct and important benefits to low-income households. Specifically, Act 129 programs allow any low-income household to access energy efficiency measures without being subject to the LIURP minimum usage threshold. This benefit is particularly important for low-income residents in multifamily buildings and small single family homes, who may have relatively high usage but may not meet the usage threshold to qualify for LIURP.⁸⁸ LIURP, on the other hand, is specifically designed to target the very highest users to help reduce collections and universal service costs.⁸⁹ But even for those low income customers who meet LIURP's usage threshold, LIURP on its own is unable to meet the need for low income energy efficiency services across PPL's service territory under the current program budget. In its April 2022 LIURP Needs Assessment, PPL reported 85,825 potential LIURP participants.⁹⁰ Under PPL's current LIURP budget, with 3,500 projected participants per year, it would take over 24 years to treat every potential participant.⁹¹ Act 129 provides critical additional funds to help meet the need for low income energy efficiency in PPL's service territory.

⁸⁷ Benjamin Goldstein, Tony G. Reames, & Joshua P. Newell, Racial Inequity in Household Energy Efficiency and Carbon Emissions in the United States: An Emissions Paradox, 84 ENERGY RESEARCH & SOCIAL SCIENCE at 5 (2022). <https://www.sciencedirect.com/science/article/pii/S2214629621004552>.

⁸⁸ PPL USECP 2023-2027 at 29 (PPL generally requires a minimum annual usage threshold of 6,000 kWh).

⁸⁹ See Id. at 23; see also 52 Pa. Code § 58.1.

⁹⁰ PPL USECP 2023-2027 at 33.

⁹¹ Id.

1 While it is critical that the two programs work in close coordination to effectively leverage
 2 impact, the Company must be careful that coordination between Act 129 and LIURP programs
 3 does not compromise the integrity of the distinct program budgets. I understand from counsel that
 4 Act 129 requires EDC's respective Act 129 low-income expenditures be *in addition to* LIURP
 5 expenditures.⁹² It is thus critical that the integrity of each program be maintained – even as we
 6 recommend harmonizing the two programs to streamline services and delivery to low-income
 7 consumers.

8 IV. ACT 129 PHASE V LOW INCOME PROGRAMS

9 *A. PPL Fails to Focus on Comprehensive Savings Opportunities*

10 **Q. Please summarize the Company's low income offerings in its proposed Phase V Plan.**

11 A. The Company proposes to implement a "Resource Constrained Energy Efficiency
 12 Program" (RCEEP) for low-income customers which would consist of three primary components,
 13 including Energy Efficient Homes, Appliance Recycling, and Student Energy Education.⁹³ PPL
 14 describes the RCEEP as "a customer assistance program"⁹⁴ though I am challenged to understand
 15 how that description is apt, given that the program as proposed relies heavily on shallow savings
 16 measures that will provide negligible savings for most participants.

⁹² 66 Pa. C.S. § 2806.1(b)(i)(G).

⁹³ Plan, p. 76 of 222.

⁹⁴ I am advised by counsel that "customer assistance programs" are defined by the Commission. 52 Pa. Code § 54.72.

Customer Assistance Program

An alternative collection method that provides payment assistance to low-income, payment troubled utility customers. CAP participants agree to make regular monthly payments that may be for an amount that is less than the current bill in exchange for continued provision of electric utility services

Id. Such programs include PPL's OnTrack program, however, PPL's RCEEP is not a customer assistance program.

1 **Q. What do you mean by the term “shallow savings”?**

2 A. I use the term “shallow savings” to describe measures and projects that provide only a small
3 amount of savings compared to overall household electricity use – effectively a measure that will
4 not in and of itself materially reduce energy burdens for participating households. I use the
5 contrasting term “deep savings” to describe measures and projects that have a significant effect in
6 reducing energy use, especially when those savings are expected to last for ten to fifteen years or
7 more.

8 **Q. Can you provide an example of a shallow savings measure?**

9 A. Yes. For example, in the 2026 TRM a Tier 1 advanced power strip is estimated to save
10 around 74 kWh per year.⁹⁵ Compared with the average low-income PPL customer’s annual
11 electricity use of over 16,000 kWh⁹⁶ for customers with electric heat, this power strip provides
12 only shallow savings – roughly 0.46% of total electricity use. This modest amount of savings will
13 not substantively reduce the energy burden of households who receive one, in contrast with a
14 “ductless heat pump” that the Company estimates will save over 2,100 kWh per installation.⁹⁷ That
15 would cause roughly a 13% annual savings for the same average customer – nearly 30 times the
16 savings that the smart strip would cause. Combining a heat pump installation with a heat pump
17 water heater and building insulation and air sealing could save even more, dramatically reducing
18 household energy costs.

19 Here, I use the term “average” low-income customer as a quick reference, but it would be
20 incorrect and unreasonable to assume that “average” is representative of the electricity use of most

⁹⁵ 2026 TRM Vol. 2, p. 170, specific use unspecified.

⁹⁶ PPL Response to CAUSE-PA I-2, Attachment 1.

⁹⁷ Plan, Appendix B, Table 9: Estimated Savings and Participation.

1 low-income customers. By definition, some customers would use less, but some would use more
2 – potentially far more – than average. Consider a customer who has electric heat and uses 25%
3 more than the average low-income electric heating customer. This customer would only see a bill
4 reduction of 0.37% from the same advanced power strip – a savings that would hardly be
5 noticeable in comparison to the large bills the household would receive. For low-income customers
6 who use more electricity than average, the relative benefit provided by such shallow measures
7 would be small, though the need for savings would be much greater.

8 **Q. Why do you say that PPL proposes to rely heavily on shallow measures?**

9 A. The advanced power strip measure I used as an example above is forecast to deliver 15%
10 of the low-income portfolio savings for PPL.⁹⁸ Low-flow showerheads and faucet aerators account
11 for 20% of the low-income savings forecast, and general service light bulb replacements account
12 for nearly 34% of the low-income savings. In fact, as I outlined in my introductory observations,
13 at least 88% of PPL’s proposed low-income savings would come from such shallow measures,
14 despite the fact that PPL says that “[a]ll programs offered by PPL Electric Utilities are
15 comprehensive in that they provide incentives for most measures found in the Pa TRM, including
16 an array of non-lighting, non-kit options, such as HVAC, solar, water heating, efficient equipment,
17 and appliances.”⁹⁹ In my opinion the use of the term “comprehensive” in the context of Act 129
18 has lost meaning and should be discarded in favor of the terms “shallow savings” to describe
19 measures and projects that have a small effect in reducing energy use and “deep savings” to
20 describe measures and projects that have a significant effect in reducing energy use, especially
21 when those savings are expected to last for ten to fifteen years or more. Deep savings measures in

⁹⁸ Plan, Table 9.

⁹⁹ Id. p. 24 of 222.

the context of RCEEP would be things such as heat pumps, heat pump water heaters, and building insulation and air sealing measures, and a deep saving project would include the installation of several of these measures. I suggest that it would be useful to consider a project to be a deep-saving project if it results in a reduction of at least 10% of household electricity use.

Q. Does the term “comprehensive” not mean what you describe as a definition for “deep savings”?

A. In my professional experience outside of Act 129 I would say yes. Consider the EmPOWER Maryland limited-income energy efficiency programs as implemented on behalf of the utility companies by Maryland’s Department of Housing and Community Development (DHCD). In its 2024-2026 program plan, DHCD described its core single family energy efficiency program:

*The Whole Home Efficiency program originated as LIEEP in 2012 and has been DHCD’s comprehensive energy program for individual households since then. Through this program, participants receive comprehensive energy retrofits directly from a pre-selected and qualified Network Partner. Network Partners can be private home improvement contractors as well as non-profits and local governments. They are selected through competitive bidding procedures that ensure high quality of services at the best prices. Network Partners receive extensive training from DHCD and have national credentials. They communicate with the clients, conduct comprehensive home energy audits, identify all eligible measures and programs, and install the eligible measures for each participant.*¹⁰⁰

Participants in this core program were forecast to experience an average energy savings of over 2,000 kWh per year.¹⁰¹ Importantly, this is an average – many customers will save considerably more than this, and it is because DHCD places a strong emphasis on comprehensive installation of deep-saving measures to provide substantive bill relief to participating households.

¹⁰⁰ EmPOWER Maryland Limited Income Program 2024-2026 Program Plan, p. 50 (underline added). <https://webpscxb.psc.state.md.us/DMS/case/9705>. ML 311369.

¹⁰¹ EmPOWER Maryland Limited Income Program 2024-2026 Program Plan, Table ES-1, 2024-2026 Forecast Metrics, p. 82. <https://webpscxb.psc.state.md.us/DMS/case/9705>. ML 304379.

1 In its FIO, the Commission explains, “We note that the EE&C programs have matured
 2 enough so that EDCs can increase their focus on more comprehensive measures.”¹⁰² But the bulk
 3 of the measures PPL forecasts it will promote, such as residential LED lighting and low flow
 4 shower heads and faucet aerators, are not comprehensive.¹⁰³ In fact, the use of the term
 5 “comprehensive” by the Pennsylvania EDCs in their plans has so watered down the meaning of
 6 the term that I find it no longer useful. While the Commission has set out a list of measure it deems
 7 “comprehensive” in the EE&C Plan template,¹⁰⁴ in the context of PPL’s EE&C Plan,
 8 comprehensive seems to mean only that a program has a large number of measures available,
 9 regardless of what the relative emphasis is on any of them. Saying that PPL’s RCEEP is
 10 comprehensive would be like saying that a restaurant with food from every cuisine on the menu is
 11 comprehensive even if nobody is ever able to order 99% of what is said to be on offer. It might be
 12 considered factually accurate, but it would still be meaningless in conveying what the popular
 13 items on the menu are.

14 **Q. Does PPL purport to emphasize deep saving measures for low-income customers?**

15 A. The Company states that “[a]ll programs feature education and technical support, where
 16 applicable, designed to encourage customers to implement multiple measures in a holistic manner,
 17 to maximize the benefits to their home or business.”¹⁰⁵ However, given its overall reliance on
 18 shallow measures to achieve its savings target there is no clear evidence that PPL expects to be
 19 effective in encouraging customers to “maximize the benefits.” For example, while PPL claims
 20 that “[c]ustomers who have existing electric heating systems may also be eligible for HVAC

¹⁰² Phase V Implementation Order at 11.

¹⁰³ Plan, Table 8 Addendum.

¹⁰⁴ See Final Phase V EE&C Plan Template Tables – Excel Workbook, Table 8 Addendum.

¹⁰⁵ Plan, p. 24 of 222.

1 system maintenance, HVAC replacement, solar, building shell measures, and controls, such as
2 smart thermostats,”¹⁰⁶ heat pumps account for less than 1% of the forecast low-income savings.¹⁰⁷
3 In fact, in terms of participation, the Company’s Plan forecasts PPL will provide over 600,000
4 general service LED bulbs, over 150,000 low flow showerheads and faucet aerators, over 40,000
5 air handler filter whistles, over 31,000 advanced power strips, and only 250 ductless heat pumps
6 over the five year Plan.¹⁰⁸ That is 250 heat pumps over a five-year period among 113,000 low-
7 income customers with electric heat.¹⁰⁹ This means one out of every 452 eligible households –
8 households with average electricity use of over 16,000 kWh per year – might expect to receive an
9 efficient heat pump through the program.

10 Figure 1 below shows the relative contribution of a variety of measure types to PPL’s
11 forecast low-income savings. Clearly, the Company has placed a high level of prioritization on
12 shallow measures that will do little to reduce the energy burdens of PPL’s low-income households.

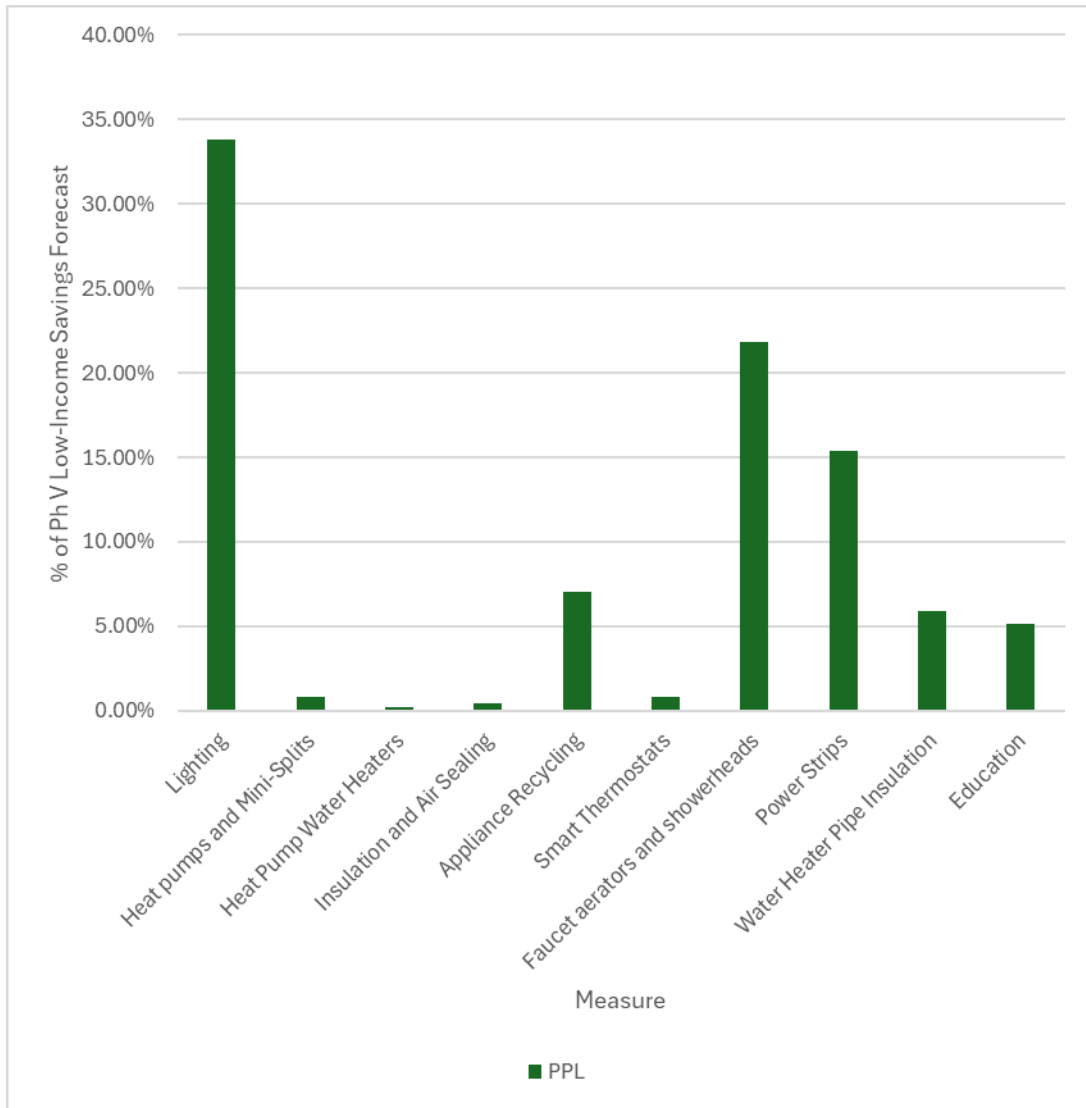
¹⁰⁶ Plan, p. 79 of 222.

¹⁰⁷ Id. p. 16, Table 9.

¹⁰⁸ Id.

¹⁰⁹ PPL Response to CAUSE-PA I-1, Attachment 1.

1

Figure 1: Measure-Level Contributions to Low-Income Savings¹¹⁰

2

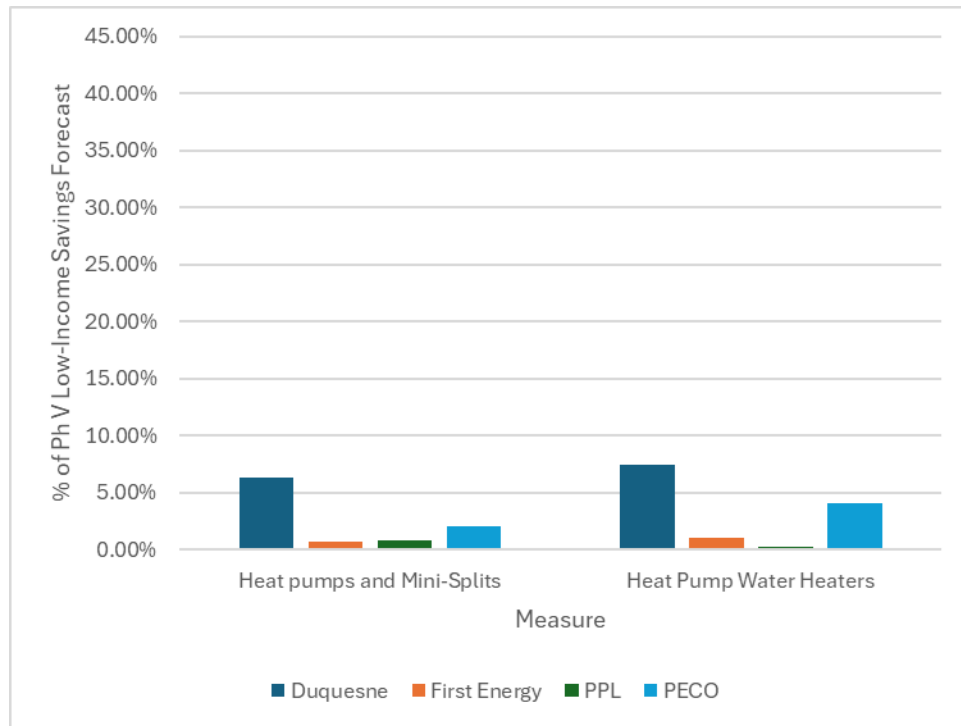
3 **Q. Is PPL an outlier or do the other EDCs similarly focus on shallow measures?**

4 A. There is certainly some variation in the level of the EDCs' prioritization of deep-savings
 5 measures, however PPL almost ignores deeper savings completely. Figure 2 shows the forecast
 6 contribution of heat pumps and heat pump water heaters as a percentage of low-income portfolio
 7 savings. In both cases PPL is at the bottom of the pack. It is worth noting that while Duquesne
 8 reports that only 16% of its low-income customers have electric heat it forecasts far more heat

¹¹⁰ Plan, Table 9.

1 pump savings than PPL, which reports that over 44% of its low-income customers have electric
 2 heat.¹¹¹

3 *Figure 2: Heat Pump and Heat Pump Water Heater Contribution to Low-Income Savings*¹¹²



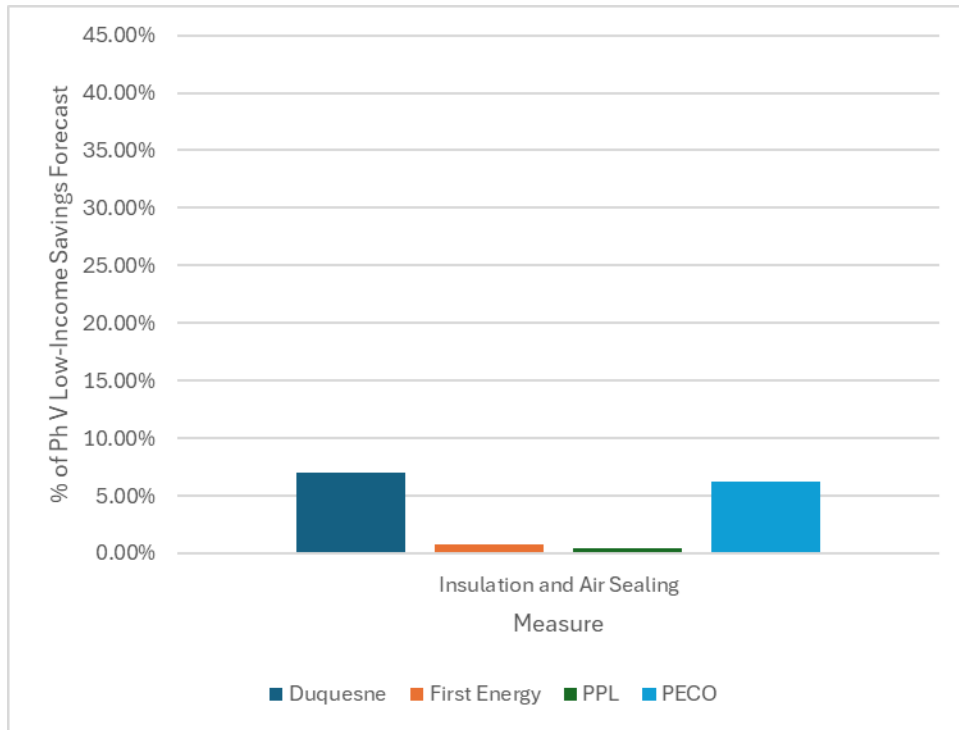
4
 5 **Q. Does PPL emphasize savings from long-lived building shell improvements such as**
 6 **insulation and air sealing?**

7 **A.** No. If anything, PPL places even less importance on this type of measure, as shown in
 8 Figure 3.

¹¹¹ Duquesne Light Phase V EE&C, Docket No. M-2025-3057325, Duquesne Response to CAUSE-PA I-1(c), attached hereto to Appendix B; PPL Response to CAUSE-PA-I-1 Attachment 1, attached hereto to Appendix B.

¹¹² Duquesne Light Phase V EE&C, Docket No. M-2025-3057325, Duquesne Response to CAUSE-PA II-20, attached hereto to Appendix B; PPL from Proposed Phase V EE&C Plan, Table 9; PECO Proposed Phase V EE&C Plan, Docket No. M-2025-3057328, Table 21. Residential Low-Income Subprogram Estimated Savings and Participation. FirstEnergy Proposed Phase V EE&C Plan, Docket No. M-2025-3057327, Appendix B, Table 9, with WARM Plus and WARM Extra Measures allocated to measure categories based on Phase IV results.

Figure 3: Building Shell Measures Contribution to Low-Income Savings¹¹³

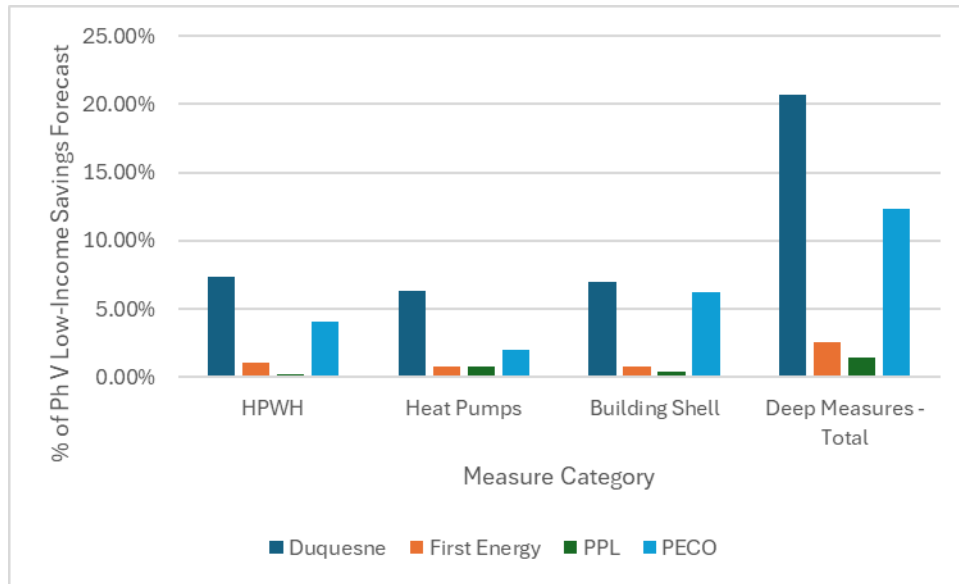


Q. Have you also estimated the combined impact of the Company's forecast of heat pumps, heat pump water heaters, and building air sealing and insulation measures?

A. The results of this estimation are shown in Figure 4. My estimation of PPL's savings that will be attributed to deep measures is de minimis, and in any case will not come close to meeting the needs of the Company's low-income customers.

¹¹³ Duquesne Light Phase V EE&C, Docket No. M-2025-3057325, Duquesne Response to CAUSE-PA II-20, attached hereto to Appendix B; PPL from Proposed Phase V EE&C Plan, Table 9; PECO Proposed Phase V EE&C Plan, Docket No. M-2025-3057329, Table 21. Residential Low-Income Subprogram Estimated Savings and Participation. FirstEnergy Proposed Phase V EE&C Plan, Docket No. M-2025-3057327, Appendix B, Table 9, with WARM Plus and WARM Extra Measures allocated to measure categories based on Phase IV results.

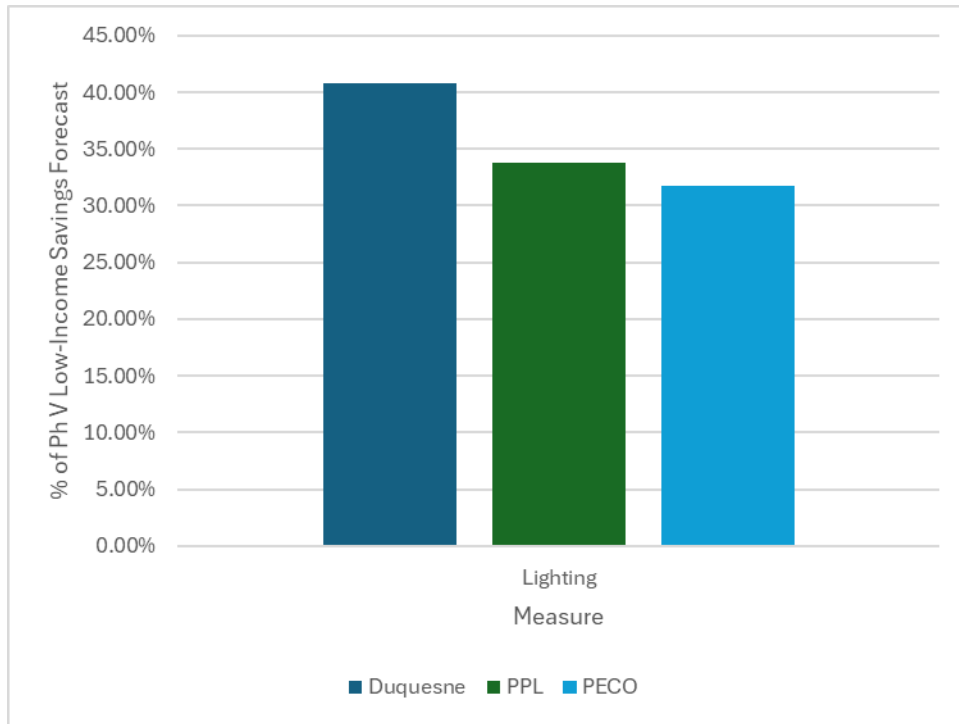
Figure 4: Deep-Saving Measures Total Contribution to Low-Income Savings¹¹⁴



Q. If not heat pumps and building shell improvements, what measures does PPL prioritize for its low-income customers?

A. Like PECO and Duquesne, PPL forecasts that the biggest share of its Phase V low-income savings will come from lighting as shown in Figure 5 – and for PPL the vast majority of that is from the direct installation of general service standard LED bulbs.

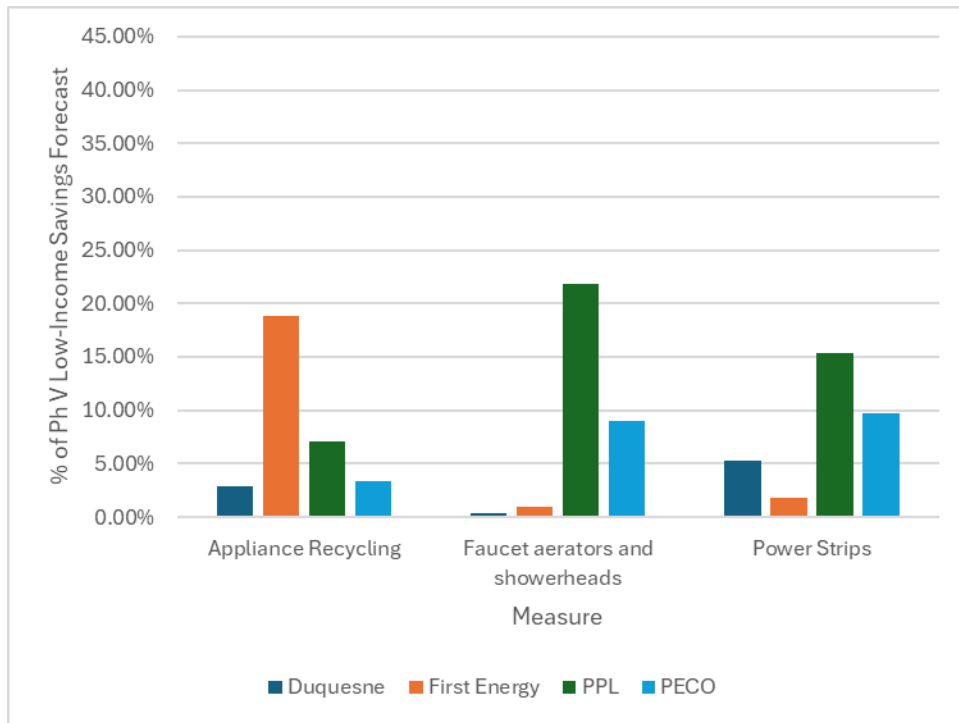
¹¹⁴ Duquesne Light Phase V EE&C, Docket No. M-2025-3057325, Duquesne Response to CAUSE-PA II-20; PPL from Proposed Phase V EE&C Plan, Docket No. M-2025-3057329, Table 9; PECO from Proposed Phase V EE&C Plan, Docket No. M-2025-3057328, Table 21. Residential Low-Income Subprogram Estimated Savings and Participation: FirstEnergy from Proposed Phase V EE&C Plan, Docket No. M-2025-3057327, Appendix B, Table 9, with WARM Plus and WARM Extra Measures allocated to measure categories based on Phase IV results.

Figure 5: Lighting Measures Contribution to Low-Income Savings¹¹⁵

However, PPL relies more heavily than Duquesne, PECO and FE on faucet aerators, shower heads and advanced power strips to comply with its low-income savings requirement, and more than all but FE on appliance recycling, as shown in Figure 6. If the Commission allows the Company to later decide to include savings from home energy reports towards achievement of its low-income savings it will only further water down the benefits the Company provides for its low-income customers.

¹¹⁵ Duquesne Light Phase V EE&C, Docket No. M-2025-3057325, Duquesne Response to CAUSE-PA II-20, attached hereto to at Appendix B; PPL Proposed Phase V EE&C Plan, Docket No. M-2025-3057329, Table 9; PECO Proposed Phase V EE&C Plan, Docket No. M-2025-3057328, Table 21. Residential Low-Income Subprogram Estimated Savings and Participation. FirstEnergy is not shown as that company did not provide sufficient detail in its filing to understand its measure prioritization.

Figure 6: Appliance Recycling, Aerators and Shower Heads, and Power Strip Measures Contribution to Low-Income Savings¹¹⁶



Q. Did the Company operate with similar measure priorities in its Phase IV programs?

A. Yes, Phase IV's low-income program implementation has focused on similar measures as are forecast for Phase V. For example, in Phase IV to date the Company has provided nearly half a million LED bulbs, and only a couple of hundred ductless heat pumps.¹¹⁷ As a result, PPL predicts that it will have left \$4.4 million that was budgeted to provide energy efficiency improvements to low-income customers and another \$5 million budgeted for general residential customers unspent in Phase IV.¹¹⁸ In approaching goal compliance in this manner the Company

¹¹⁶ Duquesne Light Phase V EE&C, Docket No. M-2025-3057325, Duquesne Response to CAUSE-PA II-20, attached hereto to Appendix B; PPL Proposed Phase V EE&C Plan, Docket No. M-2025-3057329, Table 9; PECO Proposed Phase V EE&C Plan, Docket No. M-2025-3057328, Table 21. Residential Low-Income Subprogram Estimated Savings and Participation: FirstEnergy Proposed Phase V EE&C Plan, Docket No. M-2025-3057327, Appendix B, Table 9, with WARM Plus and WARM Extra Measures allocated to measure categories based on Phase IV results.

¹¹⁷ PPL Response to CAUSE-PA I-11, Attachment 1.

¹¹⁸ PPL Response to CAUSE-PA I-36.

1 has failed to substantively address the significant energy burdens of low-income customers, and
2 appears poised to continue this misguided approach in Phase V. As noted by the Commission in
3 its Final Implementation Order, “Low Income Advocates recommend that the Commission take
4 steps to ensure the installation of longer-lived, deeper-savings measures through the EDCs’ low-
5 income programs. This includes requiring the EDCs to achieve at least 25% of the low-income
6 savings goal through comprehensive whole-home program measures that prioritize direct
7 installation of appliances, envelope measures such as air sealing and insulation, and heating and
8 cooling equipment.”¹¹⁹ Clearly, in the absence of such a requirement, PPL plans to simply continue
9 to meet its savings goal through promotion of measures that will have little impact in reducing
10 energy burdens.

11 **Q. What is your recommendation to the Commission regarding the mix of forecast**
12 **measures in PPL’s Plan?**

13 A. The evidence presented in the Company’s Plan clearly demonstrates that absent direction
14 from the Commission it will continue to favor shallow measures that provide little direct benefit
15 to “resource-constrained” low-income customers. I recommend that the Commission direct PPL
16 to rebalance its proposed measure mix in the RCEEP program such that a combination of building
17 insulation and air sealing measures and efficient heat pumps and heat pump water heaters comprise
18 25% of the low-income portfolio savings for Phase V. To maximize RCEEP’s impact on reducing
19 energy burdens, PPL should target electric resistance heating customers – particularly those
20 enrolled in CAP who may be at risk of exceeding maximum CAP credits – for these deep measures.

¹¹⁹ Phase V Implementation Order at 64.

B. Programs “Solely Directed at Low-Income Customers”

Q. Has PPL proposed to meet its low-income savings carve-out requirements through “programs solely directed at low-income customers or low-income-verified participants in multifamily housing programs”?¹²⁰

A. Only in part. As I observed earlier, as proposed the RCEEP includes three subcomponents: Energy Efficient Homes, Appliance Recycling, and Student Education. RCEEP’s Energy Efficient Homes subcomponent appears for the most part to legitimately offer unique services to low-income customers. However, Appliance Recycling and Student Education are also components of the umbrella residential program REEP – in other words, they are not programs directed solely at low-income customers as required by the Commission.

Q. Does PPL assert that these subcomponents are distinguished in some way from the REEP program?

A. No. PPL says that it “chose to align Residential and Resource Constrained Energy Efficiency Programs, including adding an Appliance Recycling and Student Energy Education component, to allow income-eligible customers to participate directly in components not previously available as a low-income program offering in Phase IV.”¹²¹ However it provides no description of the differences between these programs in the REEP and the RCEEP other than to say that “[m]arketing communications and approaches will be updated and tailored to the communication needs of income-eligible communities.”¹²² While it is important to ensure that low-income households have the opportunity to participate in these programs I do not believe that

¹²⁰ Phase V Implementation Order at 55.

¹²¹ PPL Response to OCA I-6.

¹²² Id.

1 “tailored” marketing is the same as “directed solely at low-income customers.” Savings from these
 2 subprograms should not be counted towards compliance with the low-income carve-out.

3 **Q. You said that the Energy Efficient Homes subcomponent “appears for the most part**
 4 **to legitimately offer unique services to low-income customers.” Are there aspects of this**
 5 **subcomponent that you do not view as offering unique services to low-income customers?**

6 A. Yes. PPL proposes to include Home Energy Reports (HERs) in the Energy Efficient Homes
 7 subcomponent of its RCEEP.¹²³ PPL says that “[s]elect customers will receive email reports
 8 specifically tailored to income-eligible customers with the purpose of driving customers to primary
 9 programs, and these reports will not contain any similar home comparisons.”¹²⁴ It is not apparent,
 10 however, that HERs as included in PPL’s RCEEP differ from the HERs included in the Company’s
 11 Residential Energy Efficient Program.¹²⁵ PPL states that “[t]he Company does not plan to claim
 12 savings for income-eligible home energy reports at the beginning of Phase V, though it reserves
 13 the right to do so later in the phase, if deemed appropriate.”¹²⁶ But it would not be appropriate at
 14 any point in the Phase to claim savings toward its low-income savings target from a program
 15 component the Company has failed to demonstrate is solely directed to low-income customers.

16 **Q. Do you have a specific recommendation for the Commission regarding PPL’s RCEEP**
 17 **proposal?**

18 A. Yes. I recommend the Commission disqualify the proposed resource-constrained
 19 Appliance Recycling and Student Education subcomponents from inclusion towards the low-
 20 income savings carve-out and disallow counting savings from HERs toward the low-income

¹²³ Plan at p. 80 of 222.

¹²⁴ Id.

¹²⁵ Id. at 30 of 222.

¹²⁶ Id. at 80 of 222.

1 savings carve-out at any point in Phase V. Instead, I recommend the Commission direct the
 2 Company to implement the proposed outreach and marketing strategies within the general
 3 residential offering.

4 ***C. Addressing Health and Safety Barriers***

5 **Q. Does PPL propose to address health and safety issues that would otherwise limit the**
 6 **Company's ability to provide meaningful energy efficiency measures to its low-income**
 7 **customers?**

8 A. Yes. PPL proposes to "allocate up to \$1.5 million to mitigate health and safety issues
 9 preventing comprehensive measure installation for income-eligible customers through the
 10 Resource Constrained Energy Efficiency Program. Based on the results of the Phase IV pilot, the
 11 Company forecasts that this amount will be adequate to address issues that arise for income-
 12 eligible customers within Act 129, though may allot additional funding if necessary and available,
 13 based on customer need."¹²⁷ I appreciate the Company's recognition that it is reasonable to invest
 14 in health and safety remediation in the course of implementing its low income energy efficiency
 15 program, and encourage the Commission to make it clear that PPL should not limit health and
 16 safety investments to the \$1.5 million proposed if "additional funding [is] necessary and available,
 17 based on customer need."

18 **Q. Why is it appropriate for the Company to invest in remediating health and safety**
 19 **issues for low-income customers?**

20 A. In my professional experience, going back to the early 1990's when I worked for Vermont's
 21 low-income weatherization assistance program, it has been accepted that energy efficiency

¹²⁷ Plan, p. 198 of 222.

1 programs have an obligation to provide reasonable opportunities for all classes of customers to
 2 benefit from program participation if they also pay into funding the programs. Because low-
 3 income customers pay electricity bills, they should also have the opportunity to benefit from
 4 program participation. This principle is reflected in Act 129's requirement for proportionate
 5 treatment of low income households, as explained above.¹²⁸ However, it is common for pre-
 6 existing health and safety issues to limit participation for low-income households. Such conditions
 7 can include compromised indoor air quality due to moisture problems or high occupancy, faulty
 8 wiring, and ineffective combustion appliance venting, among others. Spending to remediate health
 9 and safety barriers directly unlocks deep savings potential for households experiencing these
 10 conditions. If these conditions are not addressed, many more customers will be unable to benefit
 11 from the programs even though they are helping to fund them through their electric bills.

12 **Q. Has the Company funded remediation of health and safety issues in Phase IV?**

13 A. Yes, and its determination to continue providing health and safety funding is "built upon
 14 the successful Phase IV Health and Safety Pilot."¹²⁹ The Company says that "[t]he inclusion of
 15 additional health and safety funding will facilitate more comprehensive projects for income-
 16 eligible customers."¹³⁰ I agree that remediation of health and safety concerns is often necessary to
 17 allow energy efficiency investments without risking the health of household occupants, and urge
 18 the Company to make the most of the opportunity created by addressing these issues to provide
 19 greatly increased emphasis on deep-saving measures and by carrying out many more deep-saving
 20 projects to effectively reduce energy burdens for PPL's low-income households.

¹²⁸ 66 Pa. C.S. §2806.1(b)(1)(i)(G).

¹²⁹ PPL Electric Statement No. 1, p. 10, lines 8-9.

¹³⁰ Id. p. 14, lines 9-10.

1 **Q. Do you have a recommendation for the Commission regarding the Company's**
2 **approach to health and safety issues?**

3 A. Yes. In conjunction with my recommendation above that the Commission direct PPL to
4 increase its focus on deep saving measures, I recommend the Commission also direct PPL to
5 implement its proposed approach to health and safety measures, including to devote additional
6 funds as needed, provided the funds are available. To this point, I note once again that PPL predicts
7 that \$4.4 million that was budgeted to provide energy efficiency improvements to low-income
8 customers and another \$5 million budgeted for general residential customers will be left unspent
9 in Phase IV.¹³¹

10 ***D. Program Coordination***

11 **Q. What has the Commission said regarding program coordination for Phase V?**

12 A. In the Phase V Implementation Order, the Commission emphasized the importance of
13 improved coordination between Act 129 programs and other energy efficiency, weatherization,
14 and home repair initiatives, including the strategic use of stacked or braided funding, to overcome
15 barriers that prevent delivery of effective energy efficiency interventions.¹³² The Commission
16 acknowledged that program coordination can “lead to improved outcomes for ratepayers” and
17 “potentially allow the EDCs to accomplish more with the same funding.”¹³³ The Commission
18 further stated its position that “remediation of health and safety issues is an ideal area for
19 coordination.”¹³⁴

¹³¹ PPL Response to CAUSE-PA I-36.

¹³² Phase V Implementation Order at 158.

¹³³ Id. at 158.

¹³⁴ Id. at 167.

1 **Q. Does PPL discuss coordination between its Act 129 RCEEP and its LIURP programs?**

2 A. Regarding Act 129 and LIURP program coordination PPL says “[t]he Company does not
3 currently co-fund LIURP and Act 129 EE&C jobs.”¹³⁵ It also says that “[s]eparate contractors are
4 used to provide services to customers for LIURP and Act 129 EE&C activities.”¹³⁶ PPL does say
5 that customers who are potentially low-income do not need to apply for both Act 129 and LIURP
6 programs. By applying for “WRAP” services “their eligibility is evaluated under both the LIURP
7 and Act 129 programs to determine the most appropriate fit.”¹³⁷ PPL says that for Phase V,
8 “[p]rojects and/or measures may be jointly funded by the Resource Constrained Energy Efficiency
9 Program and LIURP, reducing contractor visits to customer homes and extending the available
10 funding of both programs” and that its Plan may provide for “potentially joint funding of projects
11 and/or split-measure costs.”¹³⁸ But rather than commit to stacking or coordinating LIURP and Act
12 129 EE&C funding to deliver more expansive EE treatment for low-income customers, PPL’s
13 LIURP policy categorically bars customers who receive Act 129 WRAP from receiving LIURP
14 WRAP for five years, subject to discretionary case-by-case exceptions.¹³⁹

15 **Q. Is the limited coordination PPL proposes between Act 129 and LIURP likely to**
16 **provide income-eligible customers with the “best possible customer experience?”**

17 A. It is hard to see how it would. I certainly appreciate that the Company has taken the step of
18 unifying the application process for LIURP and RCEEP, but there is much more it could do to
19 improve customer experience and increase the savings that are available to its low-income

¹³⁵ PPL Response to CAUSE-PA I-33 (b).

¹³⁶ PPL Response to CAUSE-PA I-33 (d).

¹³⁷ PPL Response to CAUSE-PA I-30 (a).

¹³⁸ Plan at 82, 218.

¹³⁹ PPL USECP 2023-2027 at 29.

customers. For example, in the First Energy Companies' Act 129 Phase V Plan they report they plan to

...achieve additional new and incremental electric energy savings through coordination with the Company's existing comprehensive Low-Income Usage Reduction Program ("LIURP"), known as the WARM program, by tapping the considerable expertise and existing infrastructure of LIURP contractors comprised of both Community Based Organizations ("CBOs") and private contractors. The LIURP program has offered comprehensive energy efficiency services to eligible Pennsylvania households for years. This aspect of the Phase V Plan enhances and accelerates the deployment of services to LIURP-eligible or treated households by providing additional measures and services to achieve deeper savings in addition to the LIURP services.¹⁴⁰

Coordinating the use of both LIURP and Act 129 funds to install more measures in eligible low-income households will provide more energy saving benefits than either program alone is likely to be able to provide, and will do so with less hassle for the customer.

Q. Does PPL provide a detailed explanation of how it will coordinate services between its programs and those implemented by others?

A. PPL states that "[t]he Company and selected CSP will work with all external program implementation vendor(s) to ensure the best possible customer experience...[t]his includes coordination with gas and water utilities within the Company's service territory, as applicable."¹⁴¹ However, it also says that "No joint or coordinated marketing is planned for Phase V with any external, non-Company administered programs"¹⁴² without explaining why this would support "the best possible customer experience." The Company also states that "The Act 129 EE&C program does not plan to collaborate directly with NGDCs in Phase V"¹⁴³ - again without

¹⁴⁰ Petition of FirstEnergy Pennsylvania Electric Company for Approval of a Phase V Energy Efficiency and Conservation, Docket No. M-2025-3052826, p. 17 of 157.

¹⁴¹ Plan, pp. 196-197 of 222.

¹⁴² Id. p.197 of 222.

¹⁴³ PPL Response to CAUSE-PA II-10 (b).

explaining why not collaborating is in the best interest of its low-income customers. PPL's proposed Plan does not describe plans for coordination with Weatherization Assistance Program agencies, or other types of complementary programs operated at the local or state level.

Q. Are there also steps PPL could take to improve coordination with the NGDCs that provide service in its territory?

A. Yes, definitely. For example, Duquesne Light reports that it will

...facilitate...coordination by inviting representatives from the NGDCs with overlapping service territories to its Act 129 Stakeholder meetings and will place the issue of Duquesne Light/NGDC coordination on the agenda of those meetings. Duquesne Light has actively participated in several stakeholder meetings with NGDCs throughout Phases III and IV in conjunction with the Income Eligible Advisory Group to gain valuable stakeholder input. Duquesne Light will also work with NGDCs to, where possible, provide joint rebates when the NGDC provides rebates to customers below 150% of the federal poverty level and to provide inter-utility audits to customers whose total household income is below 150% of the federal poverty level when available.¹⁴⁴

PPL has not proposed a similar level of coordination with the NGDCs that overlap its service territory, despite the fact that UGI Gas – which overlaps substantially with PPL's service territory – also administers ratepayer supported energy efficiency and conservation programming. In response to discovery PPL states that it attempted to collaborate “with UGI to utilize a mutual subcontractor to complete assessments on behalf of both companies. The coordination was limited to 31 assessments due to logistics difficulties and was not cost-effective for either program. No joint or complementary funding of energy savings occurred, and savings attribution was not split, i.e., funding and savings were attributed to the utility providing the measure. No coordination was completed with water utilities in Phase IV.”¹⁴⁵

¹⁴⁴ Duquesne Light Company – Phase V Energy Efficiency and Conservation Plan, Docket No. M-2025-3057325, p. 40.

¹⁴⁵ PPL Response to CAUSE-PA II-25 (a).

1 It is not clear why this collaboration was not more successful, and I urge the Commission
2 to direct both PPL and UGI to work diligently to resolve whatever obstacles prevent ongoing,
3 successful collaboration. I believe that the steps Duquesne plans to take, such as providing joint
4 rebates and inter-utility audits, are obvious improvements that PPL should also pursue for the
5 benefit of its vulnerable customers.

6 **Q. What does PPL say about coordinating its RCEEP with Weatherization Assistance**
7 **Program agencies, home repair initiatives, or water utilities?**

8 A. In its proposed Plan, PPL asserts that it has “successful programs that align with
9 community benefits goals of proposed Inflation Reduction Act (IRA) programs, the
10 Weatherization Assistance Program, and other energy assistance programs.”¹⁴⁶ But beyond stating
11 its alignment with the goals of these external programs, PPL provides no description of planned
12 coordination between its RCEEP and Weatherization Assistance Program agencies, home repair
13 initiatives, or water utilities in its service territory.

14 **Q: Why is it important for PPL’s Act 129 programs to be closely coordinated with other**
15 **energy efficiency, weatherization, and home repair programs serving low-income households**
16 **in its service territory?**

17 A: Effective coordination between energy efficiency, home repair, and weatherization
18 programs is essential to achieve whole-home energy savings for low-income households in PPL’s
19 service territory. Many low-income homes face significant home repair needs, such as deteriorated
20 building envelopes, moisture intrusion, or deferred maintenance, that limit the effectiveness of

¹⁴⁶ Plan, p. 82 of 222.

stand-alone energy efficiency measures.¹⁴⁷ Partnering with home repair and weatherization programs provides a critical opportunity for PPL to leverage non-Act 129 funding streams to enable deeper and more effective energy efficiency interventions under its Phase V Plan across its service territory. Coordination with non-Act 129 repair programs could be a critical tool to increasing achievement of durable, cost-effective energy savings in housing stock with high levels of need.

Q: In your view, what would effective coordination look like?

A: In my view, effective coordination planning is done with the key objectives front and center, and effective coordination implementation tracks and reviews key performance metrics to ensure that those objectives are met. I suggest that PPL minimize participation challenges by taking a “general contractor” approach to coordinating services, including by offering: 1) unified applications; 2) multi-partner audit data collection through a shared audit done for all parties by a single CSP; 3) health and safety remediation in the context an overall job; and 4) jointly funded measure installations to maximize savings and minimize scheduling conflicts, overhead expenses, and transactions costs. PPL should collaborate with other partners, including NGDCs, water utilities, the Weatherization Assistance Program, home preservation programs, DEP, and others to develop unified processes and shared objectives for delivering the best services possible to customers, as measured by ease of participation and magnitude of benefits. More is needed from PPL to coordinate at the level necessary to drive greater benefit to individual households and to

¹⁴⁷ Martín, C., et al., Catalyzing a Movement to Produce Greater Public, Private, and Civil Resources to Improve Housing Conditions Through Home Repair Programs, Joint Center for Housing Studies of Harvard University (Aug. 2024) at 4, 8, <https://www.jchs.harvard.edu/research-areas/working-papers/catalyzing-movement-produce-greaterpublic-private-and-civil>.

the programs as a whole – helping to ultimately reduce duplicative application, audit, and other program delivery and administrative costs.

Q. What is your specific recommendation to the Commission regarding PPL’s proposed level of coordination?

A. I recommend the Commission require that PPL provide seamless coordination between its RCEEP and LIURP including joint funding of projects and measures. In addition, I recommend the Commission direct PPL to take the steps necessary to further develop the seamless coordination practice I just described, and to require PPL to file a report of its actions and results along with its first annual report in Phase V and with each subsequent annual report. Specifically, to ensure meaningful collaboration with local programs, the Commission should require PPL to work with potential partners to adopt concrete coordination mechanisms. At a minimum, the Company should be directed to:

- **Establish formal referral protocols** with major home repair and weatherization program administrators in its service territory;
- **Develop data-sharing agreements** that allow for timely identification of eligible homes and information regarding completed repairs and associated energy savings;
- **Define clear scopes of work and sequencing standards** identifying which types of repairs PPL will refer to local repair and weatherization agencies as well as the order in which such measures will be addressed;
- **Create a process flow chart** illustrating the customer journey from audit through health and safety remediation through installation of energy efficiency measures;
- **Develop and implement data tracking tools and protocols** to allow the Company to track deferred jobs, when repairs are made and by whom, and to follow up by installing

energy efficiency measures that had been deferred including follow up procedures to keep customers from falling through the cracks;

- **Dedicate staff capacity and administrative resources** responsible for managing coordination efforts;
- **Establish a rhythm for project coordination check-ins** with parties that are managing coordinated programs, and come to agreement on future joint development of common applications, jointly funded measures installations, etc., and;
- **Report regularly on coordination outcomes**, including the number of referrals made, services delivered, and the role of coordination in enabling deeper energy efficiency savings.

Absent such requirements, PPL's coordination efforts are unlikely to advance beyond the limited and informal practices reflected in the Phase IV record, and the opportunity to leverage existing public investments to support deeper and more equitable energy efficiency outcomes for low-income households in its service territory will remain unrealized.

V. CONSERVATION VOLTAGE REDUCTION PILOT

Q. What is Conservation Voltage Reduction (CVR)?

A. CVR is "the intentional operation of the transmission and distribution system to provide customer voltages in the lower end of the acceptable range, with the goal of achieving energy and demand reductions for customers."¹⁴⁸ In other words, it is a practice of managing delivered

¹⁴⁸ United States Environmental Protection Agency, Conservation Voltage Reduction/Volt VAR Optimization EM&V Practices, p.2 (2017).
<https://www.energystar.gov/sites/default/files/asset/document/Volt%20Var%20and%20CVR%20EMV%20Best%20Practice%2006-01-17clean%20-%20508%20PASSED.PDF>.

1 voltages on the grid in a way that can reduce the amount of electricity that certain devices in homes
2 and businesses use. According to the USEPA, CVR can deliver energy savings

3 *because some equipment operates more efficiently at voltages in the lower end*
4 *of the acceptable range. For example, voltage reduction on open-loop loads*
5 *such as unregulated motors (e.g., ventilation motors) will lead to energy savings.*
6 *Not all customer devices will save energy from reducing voltage. For many*
7 *water heaters, operating at the lower end of the voltage range reduces*
8 *immediate demand, but ultimately uses the same amount of energy to reach a*
9 *target water temperature setting. Other loads, like today's fluorescent lamp*
10 *ballasts, are likely to draw about the same amount of power regardless of*
11 *voltage.*¹⁴⁹

12 **Q. What does PPL propose for a CVR Pilot program?**

13 A. PPL proposes, in vague terms, that it “may allot up to \$1 million for the CVR pilot” whose
14 objective is “to create and implement a methodology to reduce energy consumption and peak
15 demand through voltage optimization in front of the meter.”¹⁵⁰ The Company says that “[a] key
16 research question is whether the Company has the existing technology, including substation line
17 tap changers and voltage regulators, to implement a CVR program that is in line with Act 129.”¹⁵¹

18 **Q. Has the Company complied with the parameters for front-of-the-meter programs as**
19 **required in the Commission’s FIO?**

20 A. No. The Commission requires that any EDC that proposes to invest Act 129 funds in FTM
21 initiatives “[i]nclude the expected contribution to portfolio MWh and MW savings”¹⁵² as outlined
22 in its Phase V Energy Efficiency and Conservation Plan Template. What PPL describes is far short
23 of that – even as a pilot proposal what it describes is only half-baked. The Company says that it

¹⁴⁹ United States Environmental Protection Agency, Conservation Voltage Reduction/Volt VAR Optimization EM&V Practices, p.2 (2017).

<https://www.energystar.gov/sites/default/files/asset/document/Volt%20Var%20and%20CVR%20EMV%20Best%20Practice%2006-01-17clean%20-%20508%20PASSED.PDF>.

¹⁵⁰ Plan, p. 75 of 222.

¹⁵¹ Id.

¹⁵² See Final Phase V EE&C Plan Template, Section 3.1.6.

will “evaluate a potential CVR pilot through research to establish weather-normalized feeder performance baseline parameters that may inform potential CVR savings estimates and support planning and evaluation of any CVR deployment.”¹⁵³ In effect, it is asking for approval to use pilot program funds to do the planning required to determine if it is even viable to implement a pilot. Pilot program proposals, especially those that seek to open doors to new sources of reportable savings, should be thoroughly thought out before they are proposed, rather than seek to expend valuable, limited Act 129 funds for pre-planning.

Q. Are savings methodologies for CVR widely uniform and accepted across the industry?

A. Not at all. In fact, the Maryland Commission recently accepted a work group recommendation that “CVR impacts should be excluded from the goal-setting process after the 2024-26 program cycle.”¹⁵⁴ This decision was made, in part, because the independent evaluator proposed that the CVR savings methodologies were out of date and recommended

*the Commission consider ordering new CVR studies and industry research to update the assumptions and calculations to ensure consistency across utilities and reflect the current state of the Maryland electric appliance fleet and industry practice. The Loper Team appreciates that there are challenges associated with new studies as it does represent a considerable undertaking in both costs and coordination between utilities. Given the signal-to-noise issues inherent in CVR modeling, a new impact evaluation would need to have sufficient statistical power and experimental rigor to justify replacing prior assumptions.*¹⁵⁵

Before arbitrarily committing up to \$1 million of limited Act 129 funds to a vaguely described CVR pilot, PPL should do its due diligence and research the experience of other jurisdictions to make sure that there is a reasonable likelihood that, in the context of Act 129, CVR

¹⁵³ Plan, p. 75 of 222.

¹⁵⁴ EmPOWER Conservation Voltage Reduction Working Group Report, August 1, 2024, p. 5. <https://webpscxb.psc.state.md.us/DMS/case/9705>. ML 311369.

¹⁵⁵ EmPOWER Conservation Voltage Reduction Working Group Report, August 1, 2024, p. 5. <https://webpscxb.psc.state.md.us/DMS/case/9705>. ML 311369.

would be a good use of ratepayer funds. Any proposal for a CVR pilot should be vetted with the Statewide Evaluator prior to being put before the Commission.

Q. Do you support PPL’s proposed Conservation Voltage Reduction Pilot?

A. No. I recommend the Commission reject the proposed pilot and direct the Company to use the funds to provide more deep-savings measures for its low-income customers.

VI. RECOMMENDATIONS

Q. What are your recommendations to the Commission regarding approval of the Companies’ Act 129 Phase V Filing?

A. My overarching recommendation is that the Commission require the Company to refocus its RCEEP portfolio on deep savings measures, including building shell efficiency and efficient heat pumps and heat pump water heaters. Specifically, I recommend the following:

1. Modify the forecast measure mix for RCEEP such that building insulation and air sealing and efficient heat pumps and heat pump water heaters comprise 25% of the low-income portfolio savings for Phase V.
2. Disqualify the proposed resource-constrained Appliance Recycling and Student Education subcomponents from inclusion towards the low-income savings carve-out and disallow counting savings from HERs toward the low-income savings carve-out at any point in Phase V. Instead, direct the Company to implement the proposed outreach and marketing strategies within the general residential offering.
3. Direct PPL to implement its proposed approach to health and safety measures, including to devote additional funds as needed and available to remediate health and safety barriers to installing deep savings measures for low-income customers.

1 4. Direct PPL to take the steps necessary to develop the seamless coordination practices I
2 describe on pp. 41-48, and to require PPL to file a report of its actions and results along
3 with its first annual report in Phase V and with each subsequent annual report.

4 5. Reject the vaguely defined proposed Conservation Voltage Reduction pilot as
5 insufficiently researched and conceived, and therefore unlikely to lead to viable savings
6 towards the Act 129 savings requirement.

7 **Q. Does this conclude your Direct Testimony?**

8 A. Yes.

CAUSE-PA, Statement 1

Appendix A

Resume of Jim Grevatt

List of Proceedings in which Jim Grevatt has testified



Jim has 30 years of experience in energy efficiency, with a primary focus on residential and income-eligible program design and implementation. At Energy Futures Group Jim has advised regulators, program implementers, and advocates in two dozen states and provinces, and has provided expert witness testimony in fourteen of those jurisdictions, with a frequent emphasis on improving energy efficiency programs for customers in historically disadvantaged communities. Jim has hands-on experience with industry-leading approaches to designing and managing energy efficiency programs, including multi-family, low income, residential retrofit, new construction, HVAC, and efficient products programs. His in-depth knowledge of program operations and clear understanding of strategic thinking and planning ensure that programs achieve their desired market impacts. In past leadership roles at Efficiency Vermont, the DCSEU, and Vermont Gas, Jim had overall responsibility both for program design and operations.

✉ jgrevatt@energyfuturesgroup.com ☎ (802) 373-2488 📍 Hinesburg, VT

EXPERIENCE

Managing Consultant

Energy Futures Group, Hinesburg, VT
2013 - Present

Director, Targeted Implementation

Vermont Energy Investment Corp.,
Burlington, VT
2012 - 2013

Managing Consultant

Vermont Energy Investment Corp.,
Burlington, VT
2010 - 2012

Director, Residential Services

Vermont Energy Investment Corp.,
Burlington, VT
2005 - 2010

Manager, Energy Services

Vermont Gas Systems, S. Burlington, VT
2001 - 2005

Manager, Residential Energy Services

Vermont Gas Systems, S. Burlington, VT
1998 - 2001

Manager, HomeBase Retrofit Program

Vermont Gas Systems, S. Burlington, VT
1996 - 1998

Technical Specialist

Vermont Gas Systems, S. Burlington, VT
1994 - 1996

Associate Director and Technical Specialist

Champlain Valley Weatherization
Program, Burlington, VT
1991 - 1994

EDUCATION

University of Illinois
B.F.A., University Honors
1982

SELECT PROJECTS

Southern Environmental Law Center

2015 - Present

Provided technical support to environmental and social justice advocates in the Carolinas, and ongoing participation in the Duke Energy EE Collaborative and Dominion South Carolina EE Advisory Group, as well as technical support for SELC staff regarding pre-pay programs and other policy issues.

Coalition of Maryland Energy Efficiency Advocates

2014 - Present

Prepared written comments and multiple appearances before the Commission to present evidence regarding Maryland utilities' 2015-2017, 2018-2020, 2021-2023, and 2024-2026 EmPOWER Maryland energy efficiency plans, and in additional proceedings related to utility goal setting, cost-effectiveness testing, best-practices in low-income programs, and energy efficiency financing.

Alliance for Affordable Energy

2025

Provided expert review and draft responsive comments regarding Entergy New Orleans' Implementation Plan for Program Years 16 Through 18 of the Energy Smart Program.

Pennsylvania Utility Law Project

2025

Provided expert review and technical support for responsive comments regarding Act 129 Phase V Implementation Order and Plan Template.

Appalachian Voices, New Virginia Majority, and Virginia Organizing, Inc.

2025

Provided expert witness testimony in Virginia Natural Gas' application for a general rate increase and for authority to revise the terms and conditions applicable to natural gas service.

(continued on next page)

SELECT PROJECTS (continued)

South Carolina Coastal Conservation League and Southern Alliance for Clean Energy 2025

Provided expert witness testimony in Dominion Energy South Carolina's Request for Approval of Pilot Demand Side Management Program for Income-Qualified, High-Use Residential Customers.

Appalachian Voices 2025

Provided expert witness testimony in Virginia Electric and Power Co.'s application for approval of its 2024 DSM Update.

Appalachian Voices 2025

Provided expert witness testimony in Appalachian Power Co.'s petition in the matter of establishing energy efficiency savings targets.

South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Vote Solar, and Upstate Forever 2025

Supported comment drafting regarding Duke Energy's request for approval of modifications to its DSM portfolio.

South Carolina Coastal Conservation League and Southern Alliance for Clean Energy 2025

Provided expert witness testimony on Dominion Energy South Carolina's 2025-2029 DSM Plan.

Appalachian Voices 2024

Provided expert witness testimony in Virginia Electric and Power Co.'s application in the matter of establishing energy efficiency savings targets.

West Virginia Citizen Action Group, Solar United Neighbors, and Energy Efficient West Virginia 2024

Provided expert witness testimony in Appalachian Power Company and Wheeling Power Company Petition for Review of EE/DR Programs, Approval of the Continuation of Certain Programs, the Approval of New Programs, and Authorization of an Increase in EE/DR Rider Rates.

South Carolina Coastal Conservation League and Southern Alliance for Clean Energy 2024

Provided expert witness testimony on the value of energy efficiency to mitigate rate impacts on vulnerable customers in Dominion Energy South Carolina's 2024 rate case.

Appalachian Voices 2024

Provided expert witness testimony in Virginia Electric and Power Co.'s application for approval of its 2023 DSM Update.

The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania 2023

Provided expert witness testimony in Philadelphia Gas Works' Petition for Approval of Revised Demand Side Management Implementation Plan Fiscal Years 2025-2029.

Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association 2023

Provided expert witness testimony in Kentucky Utilities Company and Louisville Gas and Electric Company's Application for Approval of a Demand Side Management Plan.

South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Sierra Club 2023

Provided expert witness testimony on energy efficiency levels incorporated in Dominion Energy South Carolina's 2023 Integrated Resource Plan.

SELECT PROJECTS (continued)

Sierra Club and Earth Justice 2023

Provided expert witness testimony on electrification programs in Baltimore Gas and Electric Company's Application for an Electric and Gas Multi-Year Plan.

Sierra Club and Earth Justice 2023

Provided technical support for comments on Washington Gas Light Company's Application for Approval of Energy Efficiency Programs.

Appalachian Voices 2023

Provided expert witness testimony in Virginia Electric and Power Co.'s application for approval of its 2022 DSM Update.

Natural Resources Defense Council and Sierra Club 2022 - 2023

Provided expert witness testimony in Public Service Company of Colorado's Demand-Side Management and Beneficial Electrification Strategic Issues proceeding.

British Columbia Sustainable Energy Association 2022

Provided expert review, discovery, and evidence regarding Fortis BC's proposed RNG Gas Connections service.

The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Vote Solar 2022

Provided expert witness testimony describing the need for energy efficiency programming as a result of Duke Energy Progress' proposed rate increase.

The South Carolina Coastal Conservation League and Southern Alliance for Clean Energy 2022

Provided expert witness testimony critiquing Dominion Energy South Carolina's petition for new natural gas efficiency programs.

Appalachian Voices 2022

Provided expert witness testimony in Virginia Electric and Power Co.'s application for approval of its 2021 DSM Update.

Natural Resources Defense Council and Sierra Club 2021

Provided expert witness testimony in Tri-State Generation and Transmission Association's 2020 Electric Resource Plan Proceeding.

West Virginia Citizen Action Group, Solar United Neighbors, and Energy Efficient West Virginia 2021

Provided expert witness testimony in Monongahela Power Company and the Potomac Edison Company Petition and General Investigation to Determine Reasonable Rates and Charges.

Natural Resources Defense Council and Sierra Club 2021

Provided expert witness testimony in Public Service Company of Colorado's 2021 Electric Resource Plan and Clean Energy Plan proceeding.

The Institute for Sustainable Communities 2022

Partnered with Common Spark Consulting to develop an energy efficiency action plan to support increased energy efficiency programs for disadvantaged communities of the Southeast Florida Regional Climate Change Compact.

Natural Resources Defense Council, Sierra Club, and Southwest Energy Efficiency Project 2021

Provided expert witness testimony to the Public Utility Commission of Nevada regarding the Application of Southwest Gas Corporation for Approval of a Conservation and Energy Efficiency Plan for the Years 2022, 2023 and 2024.

Energy Efficient West Virginia and West Virginia Citizen Action Group 2021

Provided expert witness testimony in Appalachian Power Company and Wheeling Power Company's Petition regarding EE/DR program approvals.

SELECT PROJECTS (continued)

Appalachian Voices 2021

Provided expert witness testimony in Virginia Electric and Power Co.'s EM&V proceeding and its application for approval of its 2020 DSM Update.

The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Sierra Club, and Natural Resources Defense Council 2021

Provided expert witness testimony critiquing the market potential study used in Duke Energy Carolinas and Duke Energy Progress 2020 Integrated Resource Plans.

The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA") 2020 - 2021

Provided expert witness testimony in support of robust low-income efficiency programs in Philadelphia Gas Works Petition for Approval of Demand-Side Management Plan and PECO, Duquesne, and First Energy Act 129 Phase IV Plan proceedings.

Appalachian Voices and Natural Resources Defense Council 2020

Provided expert witness testimony in Virginia Electric and Power Co. Phase VIII DSM Program Application.

Citizens Action Coalition of Indiana 2020

Provided expert witness testimony in Duke Energy Indiana 2020-2023 DSM Plan.

The Consumers' Association of Canada (Manitoba) and Winnipeg Harvest 2019 - 2020

Provided expert witness testimony in the Efficiency Manitoba 2020/23 Efficiency Plan proceeding.

British Columbia Sustainable Energy Association 2017 - 2020

Provided expert review, discovery, and evidence in DSM-related aspects of multiple proceedings with Fortis BC, BC Hydro, and FEI.

Southern Alliance for Clean Energy and Earthjustice 2019

Provided expert witness testimony in the Florida Energy Efficiency and Conservation Act goal setting proceeding.

Energy Efficient West Virginia and West Virginia Citizen Action Group 2019

Provided expert witness testimony in Appalachian Power Company and Wheeling Power Company's Petition regarding EE/DR program approvals.

Alliance for Affordable Energy and Natural Resources Defense Council 2019 - 2021

Provided expert technical support for Louisiana Public Service Commission EE Rulemaking and Entergy New Orleans DSM Plan.

New Jersey Clean Energy Program 2015 - 2020

Planning support for NJCEP implementation team. Facilitated focus groups, worked with Board of Public Utilities Staff, program administrators, utility companies, and other stakeholders to identify opportunities to improve NJCEP strategic direction and increase benefits for ratepayers. Lead author drafting strategic plan.

Natural Resources Defense Council and Sierra Club 2017 - 2020

Provided expert witness testimony in Public Service Company of Colorado's Strategic Issues, 2019-2020 DSM Plan, and 2021-2022 DSM Plan proceedings.

Natural Resources Defense Council and Sierra Club 2018 - 2021

Provided expert witness testimony in Nevada Energy Company's 2019-2038 Triennial Integrated Resource Plan and 2019-2021 Energy Supply Plan, and 2019 and 2020 DSM Update proceedings and participated in stakeholder collaboratives.

SELECT PROJECTS (continued)

Environmental Law & Policy Center and Iowa Environmental Council 2018

Provided expert witness testimony in DSM proceedings regarding MidAmerican Energy Company's and Interstate Power and Light's 2019-2023 Energy Efficiency Plans.

Pueblo County Colorado 2018

Provided expert witness testimony in DSM proceedings regarding Black Hills Energy Company's 2019-2021 DSM Plan.

Sierra Club 2017 - 2018

Provided expert witness testimony in proceedings regarding Kentucky Power Company's DSM programs and cost-effectiveness.

California Alternative Energy and Advance Transportation Financing Authority 2017 - 2019

Provide technical assistance on development of commercial energy efficiency financing pilot.

Energy Efficiency for All 2015 - 2020

Expert technical support for affordable multifamily energy efficiency advocacy in Pennsylvania and Virginia. Worked with a coalition of energy efficiency and affordable housing advocates to shape advocacy efforts with utilities and regulators.

Regulatory Assistance Project 2016

Researched and co-authored with Chris Neme: The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years, addressing program and policy questions related to doubling the best efficiency program results.

Natural Resources Defense Council 2013

Provided expert witness testimony in support of NRDC's intervention in Ameren Illinois' 2014-2016 energy efficiency plan. Testimony demonstrated that Ameren would be capable of capturing significantly greater efficiency savings than it had proposed.

Regulatory Assistance Project 2015

Expert technical support for DSM in China. Worked with various government agencies and grid companies, as well as advocacy organizations to provide technical support related to advancing DSM and energy efficiency in China.

Vermont Public Service Department 2014 - 2015

Evaluation of Clean Energy Development Fund. Conducted interviews of staff and key stakeholders under contract to NMR and prepared memo outlining process findings and recommendations.

Evaluation of Efficiency Maine Low-Income Multi-Family Weatherization Program 2014 - 2015

Responsible for program staff and building owner interviews and process evaluation under contract to NMR and Efficiency Maine.

Northeast Energy Efficiency Partnerships 2014

Researched and co-authored meta-study of the use of energy efficiency to defer T&D investments.

Northeast Energy Efficiency Partnerships 2014

Researched and co-authored meta-study of ductless heat pump performance and market acceptance.

New Hampshire Electric Co-op 2014

Conducted assessment of the co-op's environmental and social responsibility programs' promotion of whole building efficiency retrofits, cold climate heat pumps and renewable energy systems. Presented recommendations to the co-op Board.

SELECT PROJECTS (continued)

High Meadows Fund 2014

Co-authored a study assessing the market viability of "High Performance Homes" in Vermont.

Energy Savings Potential Study, Delaware Department of Natural Resources 2013 - 2014

Led narrative development for the residential programs for a study of the energy efficiency savings potential in Delaware.

Regulatory Assistance Project 2013 - 2017

Provided technical support to energy efficiency advocates in proceedings in Maryland, Mississippi, and Missouri.

Better Buildings Solutions Center, U.S. Department of Energy 2013 - 2014

Energy Futures Group's lead author in drafting and reviewing web content for ten how-to "handbooks" detailing proven approaches to designing and implementing residential retrofit efficiency programs.

Utility Program Benchmarking 2013

Led research on behalf of a large IOU to compare the cost of saved energy across ~10 leading utility portfolios. The research sought to determine if there are discernible differences in the cost of saved energy related to utility spending in specific non-incentive categories, including administration, marketing, and EM&V.

Research on Trends in Multi-Family, HVAC, and New Construction Programs 2013 - 2014

Developed an analysis of emerging program trends on behalf of a leading energy efficiency industry firm.

Efficiency Power Plant, Regulatory Assistance Project 2013

Partnered with RAP to develop a demonstration tool to show how energy efficiency measures can be used to mitigate air quality impacts related to power production.

Natural Gas Energy Efficiency Analysis, the Green Energy Coalition 2013

Provided analytical support to demonstrate in testimony that Enbridge Gas could reduce the scale of its proposed pipeline expansion by implementing aggressive energy efficiency programs.

Targeted Implementation, VEIC 2012 - 2013

Responsible for market analysis and strategic planning for a new division expanding VEIC's energy efficiency program implementation projects.

DC Sustainable Energy Utility 2011 - 2012

Led the planning and startup implementation of Residential programs for the DC SEU, including single and multi-family and retail market programs. Led the development of the initial portfolio-level Annual Plan. Led client and partner interactions around planning and policy development. Member of DC SEU Senior Management Team.

EmPOWER Maryland Critical Program Review 2010 - 2012

Expert consultant to the Maryland Office of Peoples' Counsel in EmPOWER Maryland hearings regarding utility energy efficiency planning and reporting. Represented the OPC in stakeholder meetings that informed the current 2012-2014 EmPOWER plans. Multiple appearances before the Maryland Public Service Commission.

Efficiency Vermont 20-Year Forecast of Efficiency Potential 2010 - 2011

Senior Advisor in developing the forecast scenarios that led to significantly increased efficiency investment in Vermont.

Efficiency Vermont Residential Programs 2005 - 2010

Directed 100% growth in program budgets to nearly \$10M annually. Responsible for strategic direction, leadership, and results for Efficiency Vermont's award-winning residential retrofit, new construction, retail, and low-income programs. Supported excellence in a staff of 30.

SELECT PROJECTS (continued)

Vermont Gas Systems Efficiency Program Leader 2001 - 2005

Directed strategic planning and program operations that led to six programs and portfolio as a whole being recognized as exemplary in Responding to the Natural Gas Crisis: America's Best Natural Gas Energy Efficiency Programs (ACEEE, 2003). Built contractor infrastructure and internal support to consistently meet program objectives. Led development of Annual Reports, planning and budgeting. Collaborated with Efficiency Vermont staff to develop a fuel-blind, state-wide, jointly offered residential new construction program.

Residential Retrofit Program Development 1994 - 2005

Enhanced design and performance of VGS' residential retrofit offerings by streamlining delivery and building strong relationships with contractors, homeowners, and property managers.

Demonstrated Technical Excellence in Approaches to Residential Retrofits 1991 - 1998

Conducted hundreds of residential energy audits and quality assurance inspections for natural gas and alternative-fueled homes. Trained and coached installers to obtain desired quality. Worked to satisfy homeowners through explanation, education, sound listening to concerns, and ultimately assuring that concerns were addressed. Trained new staff in auditing techniques.

SELECT PRESENTATIONS

Small Steps in Coordination Equal Leaps and Bounds for Pennsylvania's Underserved Families: Driving Policy Improvements through Collaborative Advocacy. ACEEE 2018 Summer Study on Energy Efficiency in Buildings, August 2018.

Keys to the House: Unlocking Residential Savings with Program Models for Home Energy Upgrades. ACEEE 2016 Summer Study on Energy Efficiency in Buildings, August 2016.

Home Upgrade Program Design & Implementation Models for Acquiring Savings in Multiple Climate Zones. 2016 National Home Performance Conference, April 2016.

EERS Advancements in Maryland: EmPOWER After 2015. Presentation at ACEEE Energy Efficiency as a Resource Conference, September 2015.

Leveling the Playing Field for Distributed Energy Resources. Panelist discussing the use of energy efficiency to defer T&D investments, Acadia Center forum on Envisioning Our Energy Future, February 2015.

Residential Retrofit Programs: What's Working? Perspectives from National Program Leaders. Panelist at AESP National Conference 2012.

Elements of Retrofit Program Incentive Design. DOE Technical Assistance Program Publication, April 2011.

Designing Effective Incentives to Drive Residential Retrofit Participation. DOE Technical Assistance Program Webinar, October 2010.

Quality Assurance for Residential Retrofit Programs. DOE Technical Assistance Program Webinar, October 2010.

Home Performance with ENERGY STAR, Quality Assurance in Vermont. Panelist at the ACI Home Energy Retrofit Summit, April 2010.

Delivering on the Promise-Engaging Communities and the Public. Panelist at 2010 NEEP Summit, March 2010.

Home Performance with Energy Star in Vermont. Presentation at CEE Member meeting, June 2009.

Leading by Example: Exemplary Low Income Energy Efficiency Programs. Presented on Efficiency Vermont's Residential low income services at California's Low Income Energy Efficiency Symposium, June 2006.

Natural Gas Efficiency Policies, Responding to the Natural Gas Crisis One Therm at a Time. Co-presented with Dan York and Anna Monis Shipley of American Council for an Energy-Efficient Economy (ACEEE) -ACEEE/CEE Market Transformation Symposium, 2004.

CAUSE-PA St. 1, Appendix A
Grevatt Resume and List of Proceedings
List of Proceedings in which Jim Grevatt has testified

Jurisdiction	Date Filed	Docket	Client	Case
Illinois	11/5/2010	Docket No. 10-0568	Natural Resources Defense Council	Approval of Ameren Illinois Energy Efficiency and Demand-Response Plan
Illinois	10/18/2013	Docket No. 13-0498	Natural Resources Defense Council	Approval of Ameren Illinois Energy Efficiency and Demand-Response Plan
British Columbia, CN	2/9/2017	BCUC Project No. 3698869	B.C. Sustainable Energy Association and Sierra Club B.C.	British Columbia Hydro and Power Authority F2017-F2019 Revenue Requirements Application and F2017-F2019 Demand-Side Measures Expenditure Schedule
British Columbia, CN	5/25/2017	BCUC Project No. 3698896	B.C. Sustainable Energy Association and Sierra Club B.C.	Fortis B.C. Inc. 2016 Long Term Electric Resource Plan and Long Term Demand Side Management Plan
North Carolina	9/5/2017	Docket No. E-2, Sub 1145	North Carolina Justice Center and Southern Alliance for Clean Energy	Application of Duke Energy Progress, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider
Kentucky	11/22/2017	Case No. 2017-00097	Beverly May, Jim Webb, and Sierra Club	Investigation of the Reasonableness of the Demand Side Management Programs and Rates of Kentucky Power Company
Colorado	12/5/2017	Proceeding NO. 17A-0462EG	Natural Resources Defense Council and Sierra Club	Application of Public Service Company of Colorado for Approval of a Number of Strategic Issues Relating to its Electric and Gas Demand Side Management Plan
Colorado	3/5/2018	Proceeding NO. 17A-0462EG	Natural Resources Defense Council and Sierra Club	Application of Public Service Company of Colorado for Approval of a Number of Strategic Issues Relating to its Electric and Gas Demand Side Management Plan
British Columbia, CN	8/9/2018	BCUC Project No. 1598946	B.C. Sustainable Energy Association and Sierra Club B.C.	FortisBC Energy Inc. 2017 Long Term Gas Resource Plan
Colorado	8/24/2018	Proceeding No. 18A-0279E	Pueblo County, Colorado	Application of Black Hills/Colorado Electric Utility Company, LP for approval of its electric demand side management (DSM) plan for program years 2019-2021 and for approval of changes to its electric DSM cost adjustment tariff
Iowa	9/13/2018	Docket No. EEP-2018-0002	Environmental Law & Policy Center and Iowa Environmental Council	MidAmerican Energy Company Energy Efficiency Five-Year Plan

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Nevada	9/20/2018	Docket No. 18-06003	Sierra Club and Natural Resources Defense Council	Joint Application of Nevada Power Company d/b/a NV Energy and Sierra Pacific Power Company d/b/a NV Energy for Approval of their 2019-2038 Triennial Integrated Resource Plan and 2019-2021 Energy Supply Plan
Iowa	10/2/2018	Docket NO. EEP-2018-0004	Environmental Law & Policy Center and Iowa Environmental Council	MidAmerican Energy Company Energy Efficiency Five-Year Plan
Iowa	10/22/2018	Docket No. EEP-2018-0003	Environmental Law & Policy Center and Iowa Environmental Council	IPL Energy Efficiency Five-Year Plan
Iowa	11/9/2018	Docket NO. EEP-2018-0003	Environmental Law & Policy Center and Iowa Environmental Council	IPL Energy Efficiency Five-Year Plan
Colorado	1/23/2019	PROCEEDING NO. 18A-0606EG	Natural Resources Defense Council and Sierra Club	Application of Public Service Company of Colorado for Approval of its Electric and Natural Gas Demand Side Management (DSM) Plan for Calendar Years 2019 and 2020
Virginia	2/6/2019	Case No. PUR-2018-00168	Appalachian Voices and Natural Resources Defense Council	Application of Virginia Electric and Power Company for approval to implement demand-side management programs and for approval of two updated rate adjustment clauses
Florida	6/10/2019	Docket Nos. 20190015-EG, 20190016-EG, 20190018-EG, 20190019-EG, 20190020-EG, 20190021-EG	Southern Alliance for Clean Energy	Commission Review of Numeric Conservation Goals
West Virginia	7/10/2019	Case No. 19-0396-E-P	EEWV/CAG	Appalachian Power Company and Wheeling Power Company, Petition for Review of EE/DR Programs, Approval of New EE/DR Programs, Termination of an Existing EE/DR Program, Modifications to EE/DR Cost Calculation Methodology and Cost and Recovery Allocations, and an Increase in EE/DR Rider Rates
Manitoba	12/9/2019		Consumers' Association of Canada (Manitoba) and Winnipeg Harvest	Efficiency Manitoba 2020-23 DSM Plan
Indiana	3/2/2020	IURC CAUSE NO. 43955 DSM 8	Citizens Action Coalition of Indiana	Duke Energy Indiana Plan for DSM and EE Programs 2020-2023
Virginia	3/20/2020	SCC Case No. PUR-2019-00201	Appalachian Voices and Natural Resources Defense Council ("Environmental Respondents")	Virginia Electric and Power Company - For approval of its 2019 demand side management update pursuant to § 56-585.1 A 5 of the Code of Virginia

CAUSE-PA St. 1, Appendix A
Grevatt Resume and List of Proceedings
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Colorado	11/2/2020	Proceeding No. 20A-0287EG	Natural Resources Defense Council and Sierra Club	Application of Public Service Company of Colorado for Approval of its Electric and Natural Gas Demand Side Management (DSM) Plan for Calendar Years 2021 and 2022
Pennsylvania	12/22/2020, and 2/5/2021	Docket No. P-2014-2459362	The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA")	Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2016-2020
Pennsylvania	1/13/2021	Docket Nos. M-2020-3020820, M-2020-3020821, M-2020-3020822, M-2020-3020823	The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA")	Joint Petition for Consolidation of Proceedings and Approval of Phase IV Energy Efficiency and Conservation Plan of Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, and West Penn Power Company
Pennsylvania	1/14/2021	Docket No. M-2020-3020818	The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA")	Petition of Duquesne Light Company for Approval of Demand-Side Management Plan for FY 2016-2020
Pennsylvania	1/14/2021, and 1/27/2021	Docket No. M-2020-3020830	The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA")	Petition of PECO Energy Company for Approval of its Act 129 Phase IV Energy Efficiency and Conservation Plan
S Carolina	2/5/2021	Docket Nos. 2019-224-E and 2019-225-E	The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Sierra Club, and Natural Resources Defense Council	Duke Energy Carolinas and Duke Energy Progress 2020 Integrated Resource Plan
S Carolina	4/15/2021	Docket Nos. 2019-224-E and 2019-225-E	The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Sierra Club, and Natural Resources Defense Council	Duke Energy Carolinas and Duke Energy Progress 2020 Integrated Resource Plan
Virginia	3/23/2021	Case No. PUR-2020-00156	Appalachian Voices	In the matter of baseline determination, methodologies for evaluation, measurement, and verification of existing demand-side management programs, and the consideration of a standardized presentation of summary data for Virginia Electric and Power Company.
Virginia	4/16/2021	Case No. PUR-2020-00274	Appalachian Voices	In the matter of the application of Virginia Electric and Power Company for approval of its 2020 DSM Update pursuant to § 56-585.1 A 5 of the Code of Virginia

CAUSE-PA St. 1, Appendix A
Grevatt Resume and List of Proceedings
List of Proceedings in which Jim Grevatt has testified

W Virginia	7/23/2021	Case No. 21--0332-E-P	Energy Efficient West Virginia and West Virginia Citizen Action Group	Appalachian Power Company and Wheeling Power Company, Petition for Review of EE/DR Programs, Approval of Continuation of those Programs, and an Authorization of an Increase in EE/DR Rider Rates
Nevada	10/6/2021	Docket No. 21-06001 and Docket No. 21-06002 - Phase II	Sierra Club and Natural Resources Defense Council	Joint Application of Nevada Power Company d/b/a NV Energy and Sierra Pacific Power Company d/b/a NV Energy for Approval of their 2019-2038 Triennial Integrated Resource Plan and 2019-2021 Energy Supply Plan and Application of Sierra Pacific Power Company d/b/a NV Energy for approval of its Natural Gas Conservation and Energy Efficiency Plan for the period 2022-2024.
Colorado	10/11/2021	Proceeding 21A-0141E	Sierra Club and Natural Resources Defense Council	Application of Public Service Company of Colorado for Approval of its 2021 Electric Resource Plan and Clean Energy Plan.
W Virginia	11/12/2021	Case No. 21-0658-E-ENEC	West Virginia Citizen Action Group, Solar United Neighbors, and Energy Efficient West Virginia	Monongahela Power Company and the Potomac Edison Company Petition and General Investigation to Determine Reasonable Rates and Charges for Monongahela Power Company and The Potomac Edison Company on and after January 1, 2022
Colorado	11/23/2021	Proceeding No, 20A-0528E	Natural Resources Defense Council, Sierra Club, and Western Colorado Alliance	Application of Tri-State Generation and Transmission Association, Inc. for Approval of its 2020 Electric Resource Plan
Virginia	3/22/2022	Case No. PUR-2021-00247	Appalachian Voices	Application of Virginia Electric and Power Company for approval of its 2021 DSM Update pursuant to § 56-585.1 A 6 of the Code of Virginia
S Carolina	4/4/2022	Docket # 2021-361-G	The South Carolina Coastal Conservation League and Southern Alliance for Clean Energy	Dominion Energy South Carolina, Inc.'s Request for Approval of New Natural Gas Energy Efficiency Programs
S Carolina	4/18/2022	Docket # 2021-361-G	The South Carolina Coastal Conservation League and Southern Alliance for Clean Energy	Dominion Energy South Carolina, Inc.'s Request for Approval of New Natural Gas Energy Efficiency Programs
S Carolina	12/1/2022	Docket No. 2022-254-E	The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Vote Solar	Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rate Schedules and Charges
British Columbia, CN	12/5/2022		B.C. Sustainable Energy Association	FortisBC Energy Inc. (gas), Stage 2 Biomethane Energy Recovery Charge Rate Methodology and Comprehensive Review of a Revised Renewable Gas Program

CAUSE-PA St. 1, Appendix A
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List of Proceedings in which Jim Grevatt has testified

Colorado	12/8/2022	Proceeding 22A-0309EG	Sierra Club and Natural Resources Defense Council	Application of Public Service Company of Colorado for Approval of a Number of Strategic Issues Relating to its Electric and Gas Demand Side Management and Beneficial Electrification Plan
S Carolina	12/22/2022	Docket No. 2022-254-E	The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Vote Solar	Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rate Schedules and Charges
Colorado	1/19/2023	Proceeding 22A-0309EG	Sierra Club and Natural Resources Defense Council	Application of Public Service Company of Colorado for Approval of a Number of Strategic Issues Relating to its Electric and Gas Demand Side Management and Beneficial Electrification Plan
S Carolina	1/12/2023	Docket No. 2022-254-E	The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Vote Solar	Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rate Schedules and Charges
Virginia	3/29/2023	Case No. PUR-2022-00210	Appalachian Voices	Application of Virginia Electric and Power Company for approval of its 2021 DSM Update pursuant to § 56-585.1 A 6 of the Code of Virginia
Maryland	6/20/2023	Case No. 9692	Sierra Club	Baltimore Gas and Electric Company's Application for an Electric and Gas Multi-Year Plan
S Carolina	6/27/2023	Docket No. 2023-9-E	South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Sierra Club	Dominion Energy South Carolina, Incorporated's 2023 Integrated Resource Plan (IRP)
Kentucky	7/14/2023	Case No. 2022-00402	Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association	Joint Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates and Approval of a Demand Side Management Plan
Pennsylvania	11/13/2023	Docket No. P-2014-2459362	The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA").	Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2025-2029
Pennsylvania	1/11/2024	Docket No. P-2014-2459362	The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania ("CAUSE-PA").	Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2025-2029
Virginia	3/26/2024	Case No. PUR-2023-00217	Appalachian Voices	Application of Virginia Electric and Power Company for approval of its 2023 DSM Update pursuant to § 56-585.1 A 5 of the Code of Virginia

CAUSE-PA St. 1, Appendix A
Grevatt Resume and List of Proceedings
List of Proceedings in which Jim Grevatt has testified

S Carolina	6/5/2024	Docket No. 2024-34-E	South Carolina Coastal Conservation League and Southern Alliance for Clean Energy	Application of Dominion Energy South Carolina, Inc. for Authority to Adjust and Increase its Retail Electric Rate Schedules, Tariffs, and Terms and Conditions
W Virginia	7/10/2024	Case No. 24-0332-E-P	West Virginia Citizen Action Group, Solar United Neighbors, and Energy Efficient West Virginia	Appalachian Power Company and Wheeling Power Company Petition for Review of EE/DR Programs, Approval of the Continuation of Certain Programs, the Approval of New Programs, and Authorization of an Increase in EE/DR Rider Rates.
Virginia	9/16/2024	Case No. PUR-2023-00227	Appalachian Voices	In the matter of establishing energy efficiency savings targets for Virginia Electric and Power Company
S Carolina	9/19/2024	Docket No. 2024-192-E	South Carolina Coastal Conservation League and Southern Alliance for Clean Energy	Application of Dominion Energy South Carolina, Inc. for Approval to Continue Its Portfolio of Demand Side Management Programs to Include Approval of a New Residential Demand Response Program and Reaffirmation of Its Demand Side Management Rate Rider
Virginia	9/30/2024	Case No. PUR-2024-00134	Appalachian Voices	In the matter of establishing energy efficiency savings targets for Appalachian Power Company pursuant to VA Code § 56-596.2 B 3
Virginia	3/24/2025	Case No. PUR-2024-00222	Appalachian Voices	Virginia Electric and Power Company - For approval of its 2024 DSM Update pursuant to § 56-585.1 A 5 of the Code of Virginia
Virginia	6/16/2025	Case No. PUR-2024-00048	Appalachian Voices, New Virginia Majority, and Virginia Organizing, Inc.	Application of Virginia Natural Gas, Inc. for a general rate increase and for authority to revise the terms and conditions applicable to natural gas service
S Carolina	11/4/2025	Docket No. 2025-173-E	South Carolina Coastal Conservation League and Southern Alliance for Clean Energy	Dominion Energy South Carolina's Request for Approval of Pilot Demand Side Management Program for Income-Qualified, High-Use Residential Customers

CAUSE-PA Statement 1, Grevatt

Appendix B

Interrogatories of CAUSE-PA to PPL

PPL Response to CAUSE-PA I-1, Attachment 1

PPL Response to CAUSE-PA I-2, Attachment 1

PPL Response to CAUSE-PA I-11, Attachment 1

PPL Response to CAUSE-PA I-30

PPL Response to CAUSE-PA I-33

PPL Response to CAUSE-PA I-36

PPL Response to CAUSE-PA II-10

PPL Response to CAUSE-PA II-17

PPL Response to CAUSE-PA II-25

PPL Response to CAUSE-PA III-6

PPL Response to CAUSE-PA IV-1, Attachment 1

PPL Response to CAUSE-PA IV-2

Interrogatories of OCA to PPL

PPL Response to OCA I-6

Interrogatories of CAUSE-PA to Duquesne Light Company

Duquesne Response to CAUSE-PA I-1, Attachment I-1 C

Duquesne Response to CAUSE-PA II-20, Attachment A

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 2, 2025
Docket No. M-2025-3057329

CAUSE-PA I-1 For June 2021 to date, please identify, disaggregated by month, as of the last day of the month, the number of residential accounts served by the company, disaggregated by the following customer segments and by electric heating versus non-electric-heating accounts. Please also indicate the source data relied upon for each response.

- a) All residential customers
- b) Estimated low income customers
- c) Confirmed low income customers
- d) CAP customers
- e) Confirmed low income customers, excluding CAP customers
- f) Residential customers, excluding confirmed low income customers and CAP customers

Please provide this data in a fully functional Excel spreadsheet.

PPL Electric
Response

For subparts (a), (c), and (d), please see CAUSE-PA I-1 Attachment 1.

b) Note, PPL Electric does not maintain historic data on estimated low-income customers disaggregated by month. PPL Electric filed its most recent LIURP needs assessment on April 30, 2025, which included the estimated number of low income customers in its service territory. PPL Electric's estimated low income customer count as of April 30, 2025, is 347,822.

Data for subparts (a), (c), and (d) are from the Company's CSS. Data from subpart (b) is from Experian.

Phase IV Residential Account Breakdown by Segment and Heating Type

Year_Mo	Heating_Type	a. - All Residential Customers	c. - Confirmed Low-Income Customers	d. - CAP Customers	e. - Confirmed low income excluding CAP	f. - Residential customers excluding confirmed low income and CAP
2021-06	ELECTRIC	490,074	87,199	33,110	54,089	402,875
2021-06	NON-ELECTRIC	802,834	121,424	33,596	87,828	681,410
2021-07	ELECTRIC	489,074	86,616	32,758	53,858	402,458
2021-07	NON-ELECTRIC	800,734	120,797	33,286	87,511	679,937
2021-08	ELECTRIC	490,589	86,479	32,459	54,020	404,110
2021-08	NON-ELECTRIC	800,846	120,938	33,296	87,642	679,908
2021-09	ELECTRIC	489,133	86,281	32,270	54,011	402,852
2021-09	NON-ELECTRIC	799,136	121,165	33,225	87,940	677,971
2021-10	ELECTRIC	489,732	86,958	32,005	54,953	402,774
2021-10	NON-ELECTRIC	799,274	121,567	33,362	88,205	677,707
2021-11	ELECTRIC	490,374	87,915	31,583	56,332	402,459
2021-11	NON-ELECTRIC	798,915	121,891	33,080	88,811	677,024
2021-12	ELECTRIC	490,623	88,966	31,590	57,376	401,657
2021-12	NON-ELECTRIC	797,900	122,257	33,064	89,193	675,643
2022-01	ELECTRIC	490,828	90,698	32,014	58,684	400,130
2022-01	NON-ELECTRIC	797,102	123,339	33,313	90,026	673,763
2022-02	ELECTRIC	490,606	92,272	32,461	59,811	398,334
2022-02	NON-ELECTRIC	795,929	124,168	33,555	90,613	671,761
2022-03	ELECTRIC	492,429	93,747	33,042	60,705	398,682
2022-03	NON-ELECTRIC	797,399	125,378	33,677	91,701	672,021
2022-04	ELECTRIC	493,686	94,359	33,408	60,951	399,327
2022-04	NON-ELECTRIC	797,958	125,693	34,031	91,662	672,265
2022-05	ELECTRIC	495,585	94,458	33,349	61,109	401,127
2022-05	NON-ELECTRIC	799,354	125,978	33,856	92,122	673,376
2022-06	ELECTRIC	496,883	94,083	33,093	60,990	402,800
2022-06	NON-ELECTRIC	799,526	125,703	33,905	91,798	673,823
2022-07	ELECTRIC	496,681	93,702	33,041	60,661	402,979
2022-07	NON-ELECTRIC	798,155	125,740	34,443	91,297	672,415
2022-08	ELECTRIC	498,744	94,399	33,057	61,342	404,345
2022-08	NON-ELECTRIC	799,074	126,572	34,947	91,625	672,502
2022-09	ELECTRIC	498,031	94,348	32,912	61,436	403,683
2022-09	NON-ELECTRIC	797,221	126,842	35,233	91,609	670,379
2022-10	ELECTRIC	498,574	94,510	32,933	61,577	404,064
2022-10	NON-ELECTRIC	797,304	127,426	35,638	91,788	669,878
2022-11	ELECTRIC	498,836	95,007	32,962	62,045	403,829
2022-11	NON-ELECTRIC	795,937	127,653	35,741	91,912	668,284

2022-12	ELECTRIC	499,053	96,118	33,222	62,896	402,935
2022-12	NON-ELECTRIC	794,805	128,387	35,688	92,699	666,418
2023-01	ELECTRIC	501,947	98,539	33,432	65,107	403,408
2023-01	NON-ELECTRIC	796,601	130,007	35,928	94,079	666,594
2023-02	ELECTRIC	503,225	100,352	34,004	66,348	402,873
2023-02	NON-ELECTRIC	797,007	130,984	36,113	94,871	666,023
2023-03	ELECTRIC	503,695	101,270	34,122	67,148	402,425
2023-03	NON-ELECTRIC	796,033	131,487	35,990	95,497	664,546
2023-04	ELECTRIC	502,253	101,189	34,410	66,779	401,064
2023-04	NON-ELECTRIC	793,895	131,314	35,843	95,471	662,581
2023-05	ELECTRIC	505,008	101,279	34,491	66,788	403,729
2023-05	NON-ELECTRIC	796,275	131,247	35,750	95,497	665,028
2023-06	ELECTRIC	505,918	100,750	34,328	66,422	405,168
2023-06	NON-ELECTRIC	796,383	130,409	35,452	94,957	665,974
2023-07	ELECTRIC	506,876	101,554	33,967	67,587	405,322
2023-07	NON-ELECTRIC	795,970	131,310	34,930	96,380	664,660
2023-08	ELECTRIC	509,022	101,051	34,297	66,754	407,971
2023-08	NON-ELECTRIC	796,921	131,607	35,923	95,684	665,314
2023-09	ELECTRIC	508,252	100,740	34,604	66,136	407,512
2023-09	NON-ELECTRIC	794,669	131,938	37,051	94,887	662,731
2023-10	ELECTRIC	508,960	101,263	35,383	65,880	407,697
2023-10	NON-ELECTRIC	794,420	132,790	38,516	94,274	661,630
2023-11	ELECTRIC	508,806	101,618	35,693	65,925	407,188
2023-11	NON-ELECTRIC	792,896	133,174	39,343	93,831	659,722
2023-12	ELECTRIC	508,953	102,706	35,864	66,842	406,247
2023-12	NON-ELECTRIC	791,597	133,839	39,624	94,215	657,758
2024-01	ELECTRIC	509,534	104,572	36,352	68,220	404,962
2024-01	NON-ELECTRIC	790,949	135,029	39,873	95,156	655,920
2024-02	ELECTRIC	509,645	105,720	36,448	69,272	403,925
2024-02	NON-ELECTRIC	790,036	135,830	39,734	96,096	654,206
2024-03	ELECTRIC	511,180	106,879	36,509	70,370	404,301
2024-03	NON-ELECTRIC	791,020	136,634	39,501	97,133	654,386
2024-04	ELECTRIC	514,151	108,112	36,804	71,308	406,039
2024-04	NON-ELECTRIC	792,844	137,527	39,631	97,896	655,317
2024-05	ELECTRIC	514,706	107,435	36,966	70,469	407,271
2024-05	NON-ELECTRIC	792,763	136,931	39,792	97,139	655,832
2024-06	ELECTRIC	515,299	106,917	37,021	69,896	408,382
2024-06	NON-ELECTRIC	792,183	136,458	40,011	96,447	655,725
2024-07	ELECTRIC	517,012	106,893	36,961	69,932	410,119
2024-07	NON-ELECTRIC	792,757	136,775	40,394	96,381	655,982
2024-08	ELECTRIC	517,403	106,367	36,255	70,112	411,036
2024-08	NON-ELECTRIC	791,854	136,689	39,891	96,798	655,165

2024-09	ELECTRIC	517,084	106,429	35,243	71,186	410,655
2024-09	NON-ELECTRIC	790,646	136,967	38,619	98,348	653,679
2024-10	ELECTRIC	517,703	105,979	34,375	71,604	411,724
2024-10	NON-ELECTRIC	790,039	136,890	37,494	99,396	653,149
2024-11	ELECTRIC	517,591	105,550	33,705	71,845	412,041
2024-11	NON-ELECTRIC	788,397	136,427	36,590	99,837	651,970
2024-12	ELECTRIC	518,642	106,691	32,103	74,588	411,951
2024-12	NON-ELECTRIC	788,180	136,757	33,699	103,058	651,423
2025-01	ELECTRIC	518,962	108,747	31,702	77,045	410,215
2025-01	NON-ELECTRIC	786,649	137,541	32,679	104,862	649,108
2025-02	ELECTRIC	519,606	111,159	32,464	78,695	408,447
2025-02	NON-ELECTRIC	786,047	138,691	33,089	105,602	647,356
2025-03	ELECTRIC	521,548	113,421	33,357	80,064	408,127
2025-03	NON-ELECTRIC	786,793	140,087	33,711	106,376	646,706
2025-04	ELECTRIC	523,300	114,294	34,466	79,828	409,006
2025-04	NON-ELECTRIC	787,613	140,552	34,485	106,067	647,061
2025-05	ELECTRIC	525,159	113,867	34,976	78,891	411,292
2025-05	NON-ELECTRIC	788,004	139,948	34,928	105,020	648,056
2025-06	ELECTRIC	525,973	113,258	35,290	77,968	412,715
2025-06	NON-ELECTRIC	787,784	139,425	35,340	104,085	648,359
2025-07	ELECTRIC	526,393	113,096	35,419	77,677	413,297
2025-07	NON-ELECTRIC	787,119	139,528	35,737	103,791	647,591
2025-08	ELECTRIC	527,622	113,246	35,694	77,552	414,376
2025-08	NON-ELECTRIC	786,779	139,960	36,174	103,786	646,819
2025-09	ELECTRIC	527,241	113,530	35,808	77,722	413,711
2025-09	NON-ELECTRIC	785,378	140,302	36,619	103,683	645,076
2025-10	ELECTRIC	527,091	113,291	35,654	77,637	413,800
2025-10	NON-ELECTRIC	784,223	140,474	36,692	103,782	643,749
2025-11	ELECTRIC	525,646	113,010	35,693	77,317	412,636
2025-11	NON-ELECTRIC	781,486	140,381	36,593	103,788	641,105

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 2, 2025
Docket No. M-2025-3057329

CAUSE-PA I-2 For June 2021 to date, please identify, disaggregated by month, as of the last day of the month, the average monthly kWh electricity usage per electric heating residential account in the company's service territory, disaggregated by the following residential customer segments:

- a) All residential customers
- b) Confirmed low income customers
- c) CAP customers
- d) Confirmed low income customers, excluding CAP customers
- e) Residential customers, excluding confirmed low income customers and CAP customers

Please provide this data in a fully functional Excel spreadsheet and indicate the source data relief upon for each response.

PPL Electric
Response

See CAUSE-PA I-2 Attachment 1.

The source data is the Company's CSS for all responses.

Disaggregated Average Monthly kWh per Electric Heating Residential Account

Year_Mo	a. - All Residential Customers	b. - Confirmed Low-Income Customers	c. - CAP Customers	d. - Confirmed low income excluding CAP	e. - Residential customers excluding confirmed low income and CAP
2021-06	877.68	962.54	995.98	942.07	859.31
2021-07	989.17	1,048.35	1,044.97	1,050.40	976.44
2021-08	953.1	1,014.00	1,011.31	1,015.62	940.07
2021-09	956.96	1,018.53	1,015.18	1,020.53	943.77
2021-10	755.77	832.25	855.44	818.75	739.26
2021-11	944.31	1,109.29	1,204.36	1,055.98	908.28
2021-12	1,486.44	1,794.74	1,980.06	1,692.71	1,418.15
2022-01	1,855.71	2,205.28	2,418.53	2,088.94	1,776.47
2022-02	2,055.67	2,437.68	2,687.39	2,302.16	1,967.18
2022-03	1,576.36	1,907.12	2,114.95	1,794.00	1,498.59
2022-04	1,259.16	1,524.47	1,696.16	1,430.37	1,196.46
2022-05	940.56	1,109.75	1,228.14	1,045.14	900.72
2022-06	822.27	897.84	932.99	878.76	804.62
2022-07	921.4	981.58	989.38	977.33	907.4
2022-08	998.98	1,056.55	1,059.04	1,055.20	985.54
2022-09	919.96	980.9	987.85	977.18	905.72
2022-10	772.13	872.75	932.33	840.89	748.6
2022-11	889.35	1,057.25	1,172.70	995.92	849.85
2022-12	1,400.17	1,706.10	1,917.37	1,594.51	1,327.19
2023-01	1,799.54	2,139.32	2,327.43	2,042.73	1,716.54
2023-02	1,484.42	1,891.31	2,253.03	1,705.92	1,383.06
2023-03	1,550.18	1,861.56	2,052.58	1,764.48	1,471.82
2023-04	1,191.86	1,442.77	1,600.28	1,361.61	1,128.55
2023-05	858.37	1,004.22	1,093.47	958.13	821.78
2023-06	759.37	846.45	885.56	826.23	737.72
2023-07	868.84	937.86	941.88	935.85	851.54
2023-08	921.37	985.7	987.82	984.61	905.43
2023-09	872.29	930.88	930.05	931.31	857.8
2023-10	740.54	829.74	876.97	804.37	718.38
2023-11	863.24	1,027.15	1,130.67	971.11	822.34
2023-12	1,426.53	1,730.45	1,925.95	1,625.55	1,349.71
2024-01	1,770.65	2,127.68	2,365.86	2,000.76	1,678.49
2024-02	1,613.77	1,954.29	2,174.07	1,838.66	1,524.68
2024-03	1,390.11	1,700.84	1,900.63	1,597.19	1,307.98
2024-04	1,153.79	1,405.80	1,583.35	1,314.16	1,086.70
2024-05	797.63	930.95	1,017.28	885.66	762.46

2024-06	802.82	879.77	906.71	865.5	782.67
2024-07	987.96	1,059.41	1,059.90	1,059.15	969.34
2024-08	954.06	1,032.12	1,022.26	1,037.21	933.86
2024-09	820.14	893.31	894.84	892.56	801.18
2024-10	698.54	787.51	807.36	777.98	675.63
2024-11	794.9	947.07	1,029.25	908.51	755.92
2024-12	1,412.20	1,710.66	1,893.02	1,632.18	1,334.94
2025-01	1,982.21	2,368.69	2,612.99	2,268.16	1,879.80
2025-02	2,075.85	2,483.83	2,752.22	2,373.11	1,964.87
2025-03	1,512.65	1,834.20	2,057.20	1,741.29	1,423.33
2025-04	1,064.78	1,296.09	1,462.31	1,224.32	1,000.16
2025-05	799.94	934.98	1,017.60	898.35	762.57
2025-06	766.53	857.14	894.92	840.04	741.67
2025-07	975.14	1,058.08	1,053.78	1,060.04	952.44
2025-08	951.29	1,036.17	1,028.16	1,039.86	928.11
2025-09	787.96	867.07	875.05	863.39	766.27
2025-10	698.04	788	813.7	776.19	673.41
2025-11	882.76	1,058.40	1,166.07	1,008.70	834.65

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 2, 2025
Docket No. M-2025-3057329

CAUSE-PA I-11 Please list all measure types provided to a customer through the company's low income residential EE&C programs during Phase IV, disaggregated by low income single family, master metered multifamily, and individually metered multifamily. Please provide this data in the original Excel or Word format.

PPL Electric See CAUSE-PA I-11 Attachment 1.
Response

Phase IV Low Income Measures: MWh & Lifetime Savings & Incentive

Measure Type	Unit	Single Family Eligible?	Individually Metered Multifamily Eligible?	Master Metered Multifamily Eligible?
Air Sealing for Building Shell	Project	Yes	Yes	Yes
Bath Aerator	Product	Yes	Yes	Yes
Bath Aerator Water Kit	Product	Yes	Yes	Yes
Battery Replaced in Existing Smoke Alarm	Product	Yes	Yes	Yes
Carbon Monoxide Detector	Product	Yes	Yes	Yes
Ceiling Insulation	Square Foot	Yes	No	No
Ductless Mini-split Heat Pump On-site - Outdoor Unit	Product	Yes	Yes	Yes
Ductless Mini-split Heat Pump On-site - Primary Zone	Product	Yes	Yes	Yes
Ductless Mini-split Heat Pump On-site - Secondary Zone	Product	Yes	Yes	Yes
Energy Star Air Purifier	Product	Yes	Yes	Yes
Energy Star Dehumidifier	Product	Yes	Yes	Yes
Health and Safety Measures	Project	Yes	Yes	Yes
Heat Pump Water Heater	Product	Yes	Yes	Yes
HVAC Maintenance ASHP	Project	Yes	Yes	Yes
HVAC Maintenance CAC	Project	Yes	Yes	Yes
Kitchen Aerator	Product	Yes	Yes	Yes
Kitchen Aerator Water Kit	Product	Yes	Yes	Yes
LED Bulb Welcome Kit	Bulb	Yes	Yes	Yes
LED Bulb	Bulb	Yes	Yes	Yes
LED Night Light	Bulb	Yes	Yes	Yes
Low Flow Showerhead Hand Held	Product	Yes	Yes	Yes
Low Flow Showerhead	Product	Yes	Yes	Yes
Low Flow Showerhead Water Kit	Product	Yes	Yes	Yes
On-site assessment & Energy Education On-site	Product	Yes	Yes	Yes
Recycle and Replace Refrigerator	Product	Yes	Yes	Yes
Remote assessment & Energy Education Remote Energy Assessment	Product	Yes	Yes	No
Room AC Retirement and Replacement	Product	Yes	Yes	Yes
Room AC Retirement Only	Product	Yes	Yes	Yes
Smart Strips - Tier 1	Product	Yes	Yes	Yes
Smart Thermostat	Product	Yes	Yes	Yes
Smoke Alarm	Product	Yes	Yes	Yes
Thermostatic Shower Restriction Valve	Product	Yes	Yes	Yes
Water Heater Pipe Insulation	Foot	Yes	Yes	Yes
Water Heater Temperature Setback	Product	Yes	Yes	Yes
Water Kit MF	Kit	No	Yes	Yes
Water Kit SF	Kit	Yes	Yes	Yes
Welcome Kit	Kit	Yes	Yes	Yes

Participation					Energy Consumption Reduction (MWh)				
PY13	PY14	PY15	PY16	PY17 (to date)	PY13	PY14	PY15	PY16	PY17 (to date)
0	5	16	57	1	0.00	17.70	22.89	71.20	2.33
5590	4863	3083	3916	1911	509.30	458.29	289.98	370.15	180.78
0	0	7273	25325	17021	0.00	0.00	174.48	639.71	434.66
43	53	13	27	6	0.00	0.00	0.00	0.00	0.00
3350	2032	1192	819	293	0.00	0.00	0.00	0.00	0.00
0	8502	20442	98114	4250	0.00	20.78	82.17	401.14	32.56
0	0	22	43	3	0.00	0.00	0.00	0.00	0.00
0	0	20	39	3	0.00	0.00	110.30	214.05	14.18
0	0	53	115	9	0.00	0.00	129.18	282.49	16.21
18	129	2229	708	165	8.78	66.85	1109.72	183.35	35.89
11	104	152	122	66	3.01	28.50	25.38	20.37	11.02
0	118	339	346	29	0.00	0.00	0.00	0.00	0.00
0	153	157	274	29	0.00	299.84	316.26	559.34	56.79
0	0	15	14		0.00	0.00	3.86	4.99	0.00
0	0	4	18		0.00	0.00	0.37	1.63	0.00
3733	3357	2422	2830	1410	929.30	790.89	570.41	661.06	327.21
0	0	7273	25325	17021	0.00	0.00	551.22	1815.61	1205.08
46930	36422	0	0	0	435.51	338.00	0.00	0.00	0.00
139699	112671	93563	100395	47266	6399.66	4407.48	3879.03	4606.07	2281.62
11380	5800	1348	3307	1230	299.07	152.42	35.43	86.91	32.32
3059	3376	3109	4157	2049	990.20	1090.58	1002.25	1340.30	660.96
1902	1532	1152	1854	933	615.23	495.07	370.85	597.22	300.51
0	0	7273	25325	17021	0.00	0.00	826.21	2870.40	1928.25
55	3207	8379	11489	5644	3.30	192.42	502.74	689.34	338.64
0	3	15	23	119	0.00	2.09	10.44	16.01	81.59
7859	5272	1962	1819	760	471.54	316.32	117.72	109.14	45.60
0	371	366	727	845	0.00	26.08	21.98	35.61	37.33
0	2	10	9	22	0.00	0.26	1.33	1.10	2.82
15958	17023	15708	20907	10522	1604.09	1712.51	1577.50	2098.94	1058.35
0	45	19	13	0	0.00	68.49	20.31	10.93	0.00
5854	2756	1179	666	262	0.00	0.00	0.00	0.00	0.00
4884	3919	2537	3390	1667	368.45	343.28	217.46	274.74	135.17
0	796	3554	13466	5589	0.00	7.02	31.35	118.77	49.29
0	256	782	3161	1711	0.00	17.02	69.68	222.64	116.12
0	0	0	5433	4447	0.00	0.00	0.00	0.00	0.00
0	0	7273	19892	12574	0.00	0.00	0.00	0.00	0.00
23465	18211	0	0	0	0.00	0.00	0.00	0.00	0.00

Lifetime Ex Ante Energy Consumption Reduction (MWh)					Incentive Costs (\$)				
PY13	PY14	PY15	PY16	PY17 (to date)	PY13	PY14	PY15	PY16	PY17 (to date)
0	265	343	1068	35	\$0	\$10,750	\$30,780	\$105,650	\$1,700
5093	4583	2900	3702	1808	\$11,180	\$9,726	\$6,166	\$7,832	\$3,822
0	0	1745	6397	4347	\$0	\$0	\$7,273	\$25,325	\$17,021
0	0	0	0	0	\$206	\$253	\$62	\$129	\$29
0	0	0	0	0	\$67,040	\$40,640	\$23,840	\$16,380	\$5,860
0	312	1233	6017	488	\$0	\$24,531	\$54,329	\$403,298	\$18,470
0	0	0	0	0	\$0	\$0	\$165,000	\$322,500	\$22,500
0	0	1654	3211	213	\$0	\$0	\$75,000	\$146,250	\$11,250
0	0	1938	4237	243	\$0	\$0	\$198,750	\$431,250	\$33,750
79	602	9988	1650	323	\$4,500	\$32,250	\$557,250	\$177,000	\$41,250
36	342	305	244	132	\$3,135	\$29,640	\$43,320	\$34,770	\$18,810
0	0	0	0	0	\$0	\$73,472	\$205,177	\$434,816	\$37,073
0	2998	3163	5593	568	\$0	\$520,200	\$533,800	\$931,600	\$98,600
0	0	12	15	0	\$0	\$0	\$5,250	\$4,900	\$0
0	0	1	5	0	\$0	\$0	\$1,400	\$6,300	\$0
9293	7909	5704	6611	3272	\$11,199	\$10,071	\$7,266	\$8,490	\$4,230
0	0	5512	18156	12051	\$0	\$0	\$7,273	\$25,325	\$17,021
6533	5070	0	0	0	\$211,185	\$163,899	\$0	\$0	\$0
95995	66112	58185	69091	34224	\$1,006,580	\$812,695	\$675,457	\$722,523	\$342,490
2393	1219	283	695	259	\$22,764	\$11,600	\$2,696	\$6,614	\$2,460
8912	9815	9020	12063	5949	\$46,680	\$51,518	\$47,443	\$63,436	\$31,268
5537	4456	3338	5375	2705	\$17,904	\$14,516	\$10,840	\$17,446	\$8,780
0	0	7436	25834	17354	\$0	\$0	\$58,184	\$202,600	\$136,168
0	0	0	0	0	\$7,485	\$432,945	\$1,131,165	\$1,551,015	\$761,940
0	30	146	224	1142	\$0	\$2,550	\$13,847	\$21,232	\$109,852
0	0	0	0	0	\$471,480	\$316,320	\$117,720	\$109,140	\$45,600
0	235	198	320	336	\$0	\$166,950	\$164,700	\$327,150	\$380,250
0	1	4	3	8	\$0	\$200	\$1,000	\$900	\$2,200
8020	8563	7887	10495	5292	\$398,950	\$425,575	\$392,700	\$522,675	\$263,050
0	753	223	120	0	\$0	\$15,750	\$6,080	\$4,160	\$0
0	0	0	0	0	\$40,978	\$19,292	\$8,253	\$4,662	\$1,834
5527	5149	3262	4121	2028	\$129,328	\$103,775	\$67,180	\$89,767	\$44,142
0	91	408	1544	641	\$0	\$1,401	\$6,255	\$23,700	\$9,837
0	34	139	445	232	\$0	\$2,560	\$7,820	\$31,610	\$17,110
0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
0	0	0	0	0	\$0	\$0	\$0	\$0	\$0

**PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 2, 2025
Docket No. M-2025-3057329**

CAUSE-PA I-30 For Phase IV, please provide, disaggregated by program year:

- a) The number of customers who were referred from the company's EE&C programs to the company's LIURP;
- b) The number of those customers identified in response to subsection (a) who subsequently received LIURP services.

PPL Electric
Response

- a) When a customer applies for WRAP services, their eligibility is evaluated under both the LIURP and Act 129 programs to determine the most appropriate fit automatically. The program assignment is based on specific account characteristics and program criteria. See CAUSE-PA I-34 Attachment(s) 1-4.
- b) See the answer above – there is no data to provide.

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 2, 2025
Docket No. M-2025-3057329

CAUSE-PA I-33

Please indicate whether a customer can receive coordinated services funded through both the company's LIURP and the company's low income EE&C programs. If the answer to this question is yes, please describe:

- a) How the company determines which measures will be funded by each program;
- b) How the company deems electric savings from coordinated or co-funded LIURP/EE&C jobs to each program;
- c) The steps a customer must take to receive services from both programs, including whether a separate application for each program is required;
- d) Whether the same contractor is used to provide services to the consumer;
- e) If separate contractors are used to provide services, whether those contractors are coordinated to provide services at the same time.

PPL Electric
Response

PPL Electric has an existing collaboration between Act 129 and LIURP programs that ensure customers are evaluated and receive a program assignment with associated measures which is seamless to the customer but is based on the best possible customer outcome.

Other key program coordination activities include joint marketing, integrated customer intake, internal administrative collaboration and management alignment, and consistent quality assurance and control approaches.

- a) The Company evaluates the customer's application and makes the assignment based on the following criteria: income guidelines, premise usage, annual kWh, and frequency of program benefits.

WITNESS: Thomas McAteer

b) The Company does not currently co-fund LIURP and Act 129 EE&C jobs and claims 100% of the savings for measures funded by each program.

c) A separate application is not required for LIURP or Act 129 EE&C.

d) Separate contractors are used to provide services to customers for LIURP and Act 129 EE&C activities. The timing of services is not coordinated as contractor and customer availability, as well as frequency of potential coordination, make it not feasible.

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 2, 2025
Docket No. M-2025-3057329

CAUSE-PA I-36 Please provide the projected dollar amount of the company's Phase IV EE&C plan budgets that the company projects will remain unspent by the end of Phase IV for each of the following customer segments. Please describe how the company arrived at this projection.

- a) Residential Customers
- b) Low Income Residential Customers
- c) Small Commercial & Industrial Customers
- d) Large Commercial & Industrial Customers

PPL Electric
Response The projected dollar amounts of the Company's Phase IV EE&C Plan budgets that the Company projects will remain unspent by the end of Phase IV were derived by deducting actual and forecasted values from EE&C plan values. The estimated values, which are subject to change, are below:

- a) Residential Customers - \$5 million
- b) Low Income Residential Customers - \$4.4 million
- c) Small Commercial & Industrial Customers - \$11.3 million
- d) Large Commercial & Industrial Customers - \$6.5 million

PPL Electric Utilities Corporation
Response to the Set II Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 9, 2025
Docket No. M-2025-3057329

CAUSE-PA 2-10 Please explain whether and how the company's proposed Phase V Plan provides for coordination of its low-income EE&C program with:

- a) The federal Weatherization Assistance Program (WAP)
- b) The LIURP and EE&C programs run by NGDCs with service territories that overlap with the company's service territory.

PPL Electric
Response

- a) The Company's Plan generally aligns with the goals of federal initiatives like the Weatherization Assistance Program, though the Plan is not reliant on external coordination to meet goals. PPL Electric welcomes opportunities to collaborate to improve customer experience. The Company will reference external offerings such as WAP and encourage customer participation where appropriate – both the Act 129 EE&C program and LIURP consistently connect customers with additional resources to ensure they receive the full range of assistance available. For example, customers are provided with referrals to other assistance programs available in their county at the time of an energy assessment.
- b) The Act 129 EE&C program does not plan to collaborate directly with NGDCs in Phase V, though PPL Electric has an existing collaboration between its Act 129 programs and LIURP that ensures customers are evaluated and receive a program assignment which is seamless to the customer but is based on the best possible customer outcome.

PPL Electric Utilities Corporation
Response to the Set II Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 9, 2025
Docket No. M-2025-3057329

CAUSE-PA 2-17 Please refer to p. 13 of the Company's Petition: "the Company has expanded the scope of its low-income EE&C programs by aligning measure and channel delivery with the Residential Program, which keeps the existing participation pathways while expanding options for income-eligible customers."

a) Please describe specifically the Company's meaning in the referenced statement.

b) In what way(s) does the referenced change expand the scope of the Company's low-income programs? Will the change provide more savings for low-income customers? Please explain.

c) In what way(s) are existing participation pathways kept and why?

PPL Electric
Response

a) The Company will maintain single and multifamily assessments in the Resource Constrained (Low-Income) Energy Efficiency Program, which are available in Phase IV. In Phase V, the Company is offering Appliance Recycling and Student Energy Efficiency Education components specifically to low-income customers, as well as no-cost measures through the Company's online Marketplace. The added components will feature income-eligible-specific communications and marketing tactics to promote higher participation for this segment.

b) The scope of the program required an increase in the anticipated budget for the Resource Constrained Energy Efficiency Program (low-income) as compared to Phase IV. The Company anticipates that the increased program offerings and budget will increase expected savings attributable to low-income customers as compared to Phase IV, without considering Phase III carry-over.

c) See the answer to subpart(a). Assessments were kept to ensure income-eligible customers have access to direct-install and comprehensive measures, in-person education, and to provide the primary pathway to achieve the Company's savings targets.

PPL Electric Utilities Corporation
Response to the Set II Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 9, 2025
Docket No. M-2025-3057329

CAUSE-PA 2-25 Please refer to Section 4.4.1 of the Company's Plan: "This includes coordination with gas and water utilities within the Company's service territory, as applicable. No joint or coordinated marketing is planned for Phase V with any external, non-Company administered program."

a) Has the Company explored joint marketing with gas and/or water utilities that provide services in its territory? If yes, please describe the exploration, and if no, why not?

b) Please describe, and provide specific examples, of projects where the Company coordinated with a gas or water utility. Please describe the coordination and any joint or complementary funding of energy savings measures.

PPL Electric
Response

- a) The Company has not explored joint marketing due to concerns with brand attribution, timeliness of the development and review processes, and potential customer confusion.
- b) The Company has collaborated with UGI to utilize a mutual subcontractor to complete assessments on behalf of both companies. The coordination was limited to 31 assessments due to logistics difficulties and was not cost-effective for either program. No joint or complementary funding of energy savings occurred, and savings attribution was not split, i.e., funding and savings were attributed to the utility providing the measure. No coordination was completed with water utilities in Phase IV.

**PPL Electric Utilities Corporation
Response to the Set III Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated December 18, 2025
Docket No. M-2025-3057329**

CAUSE-PA III-6	Using the most recent data available, please indicate the average income of the company's confirmed low-income customers.
PPL Electric Response	The average annual income of PPL Electric's currently identified confirmed low-income customers is \$17,103.48. Note that the Company may not have income data for all confirmed low-income customers, particularly when the designation is based solely on the receipt of a LIHEAP grant.

PPL Electric Utilities Corporation
Response to the Set IV Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated January 7, 2026
Docket No. M-2025-3057329

CAUSE-PA IV-1 From June 1, 2021, to date, disaggregated by month and year, as of the last day of the month/ year, please indicate how many CAP customers exceeded their maximum CAP credit limit in that month.

Please provide this data in a live Excel spreadsheet.

PPL Electric
Response See CAUSE-PA-IV-1 Attachment 1. Data is available only for the period provided.

Year_Month	Number of accounts surpassed Limits
2023-08	-
2023-09	3
2023-10	12
2023-11	58
2023-12	372
2024-01	1,404
2024-02	1,594
2024-03	1,689
2024-04	1,498
2024-05	720
2024-06	744
2024-07	1,019
2024-08	803
2024-09	581
2024-10	353
2024-11	379
2024-12	773
2025-01	1,358
2025-02	1,790
2025-03	1,401
2025-04	894
2025-05	473
2025-06	540
2025-07	868
2025-08	859
2025-09	699
2025-10	617
2025-11	775
2025-12	1,548

Year_Month	Accounts with Increase
2023-09	89
2023-10	183
2023-11	191
2023-12	251
2024-01	465
2024-02	1,073
2024-03	1,273
2024-04	1,598
2024-05	1,519
2024-06	769
2024-07	936
2024-08	1,413
2024-09	831
2024-10	883
2024-11	430
2024-12	564
2025-01	639
2025-02	891
2025-03	1,724
2025-04	1,964
2025-05	1,276
2025-06	648
2025-07	735
2025-08	885
2025-09	947
2025-10	931
2025-11	804
2025-12	1,288

Year_Month	Average OTBB Bill	
2023-09	\$	466.43
2023-10	\$	415.14
2023-11	\$	411.67
2023-12	\$	398.39
2024-01	\$	390.45
2024-02	\$	377.16
2024-03	\$	412.22
2024-04	\$	376.90
2024-05	\$	345.93
2024-06	\$	336.81
2024-07	\$	306.63
2024-08	\$	287.32
2024-09	\$	281.52
2024-10	\$	276.32
2024-11	\$	284.43
2024-12	\$	300.89
2025-01	\$	326.08
2025-02	\$	344.95
2025-03	\$	365.89
2025-04	\$	360.88
2025-05	\$	336.93
2025-06	\$	313.72
2025-07	\$	303.03
2025-08	\$	289.95
2025-09	\$	290.33
2025-10	\$	295.94
2025-11	\$	312.93
2025-12	\$	333.26

Year_Month	Average Difference	
2023-09	\$	354.81
2023-10	\$	319.34
2023-11	\$	320.46
2023-12	\$	312.21
2024-01	\$	309.43
2024-02	\$	294.04
2024-03	\$	327.10
2024-04	\$	286.76
2024-05	\$	260.89
2024-06	\$	257.74
2024-07	\$	235.60
2024-08	\$	219.91
2024-09	\$	214.11
2024-10	\$	210.52
2024-11	\$	220.98
2024-12	\$	228.60
2025-01	\$	250.91
2025-02	\$	265.12
2025-03	\$	282.53
2025-04	\$	266.92
2025-05	\$	245.75
2025-06	\$	232.01
2025-07	\$	228.39
2025-08	\$	214.24
2025-09	\$	218.26
2025-10	\$	221.97
2025-11	\$	236.07
2025-12	\$	251.79

Year_Month	0 to 30 Days	31 to 60 Days	61 to 90 Days	91 to 120 Days	121+ Days
2023-09	0	0	0	0	22
2023-10	0	0	0	0	41
2023-11	0	0	0	0	43
2023-12	0	0	0	14	50
2024-01	0	0	18	39	97
2024-02	0	16	97	58	120
2024-03	0	104	89	36	171
2024-04	3	158	77	55	194
2024-05	2	68	93	67	164
2024-06	0	42	46	17	71
2024-07	1	67	42	22	69
2024-08	0	75	46	5	104
2024-09	0	39	5	0	79
2024-10	0	0	0	0	93
2024-11	0	1	0	0	50
2024-12	0	0	0	15	52
2025-01	0	0	13	21	33
2025-02	0	24	39	22	51
2025-03	1	57	88	62	79
2025-04	8	102	97	57	56
2025-05	1	52	38	26	11
2025-06	1	23	20	9	0
2025-07	2	28	8	0	0
2025-08	1	8	0	0	0
2025-09	1	0	0	0	0
2025-10	1	0	0	0	0

Year_Month	0 to 30 Days	31 to 60 Days	61 to 90 Days	91 to 120 Days	121+ Days
2023-08	-	-	-	-	-
2023-09	9	22	15	-	37
2023-10	9	17	-	-	118
2023-11	-	-	-	1	152
2023-12	-	-	2	100	108
2024-01	-	-	178	109	120
2024-02	24	405	294	90	126
2024-03	276	429	226	92	124
2024-04	148	877	188	64	136
2024-05	180	633	272	87	144
2024-06	111	361	64	44	68
2024-07	108	380	136	47	105
2024-08	201	545	122	15	234
2024-09	79	390	17	-	153
2024-10	30	32	2	2	477
2024-11	-	1	2	-	282
2024-12	-	-	53	127	190
2025-01	1	7	195	83	114
2025-02	104	278	171	57	82
2025-03	161	442	455	177	110
2025-04	264	667	371	99	104
2025-05	101	531	181	79	43
2025-06	65	264	97	29	12
2025-07	39	340	82	37	2
2025-08	141	324	100	1	-
2025-09	73	399	-	1	-
2025-10	-	-	-	1	-
2025-11	-	1	-	-	-
2025-12	-	-	-	-	-

Year_Month	Total_Account_Balance
2024-04	\$ 316,263.76
2024-05	\$ 908,115.28
2024-06	\$ 663,725.46
2024-07	\$ 587,814.36
2024-08	\$ 469,525.10
2024-09	\$ 549,392.41
2024-10	\$ 495,672.89
2024-11	\$ 243,054.01
2025-01	\$ 1,192.48
2025-04	\$ 610,655.98
2025-05	\$ 844,756.76
2025-06	\$ 967,610.71
2025-07	\$ 784,981.58
2025-08	\$ 636,276.06
2025-09	\$ 586,557.05
2025-10	\$ 549,801.60

PPL Electric Utilities Corporation
Response to the Set IV Data Requests of the
Coalition for Affordable Utility Services and Energy Efficiency (CAUSE-PA)
Dated January 7, 2026
Docket No. M-2025-3057329

CAUSE-PA IV-2

From June 1, 2021, to date, disaggregated by month and year, as of the last day of the month/ year, please indicate for customers who exceeded their maximum CAP credit limits:

- a) The number of CAP participants who had their rates increased as a result of exceeding their maximum CAP credit limits;
- b) The average monthly bill that these customers received after exceeding their maximum CAP credit limits;
- c) The average difference between the monthly bills before and after exceeding their maximum CAP credit limits;
- d) The number of customers who were terminated for nonpayment after exceeding their maximum CAP credit limits, within the following intervals of exceeding their maximum CAP credit limits (1) 0-30 days; (2) 31-60 days; (3) 61-90 days; (4) 91-120 days; and (5) 121 days or later.
- e) The number of customers who received a termination notice after exceeding their maximum CAP credit limits, within the following intervals of exceeding their maximum CAP credit limits (1) 0-30 days; (2) 31-60 days; (3) 61-90 days; (4) 91-120 days; and (5) 121 days or later.
- f) For the customers identified in response to subpart (d), please indicate the total amount(s) of uncollectible expenses related to these accounts and/or account balances.

Please provide this data in a live Excel spreadsheet.

WITNESS: Thomas McAteer

PPL Electric
Response

See CAUSE-PA-IV-1 Attachment 1. Data is available only for periods provided in the attachment

PPL Electric Utilities Corporation
Response to the Set I Data Requests of the
Office of Consumer Advocate (OCA)
Dated December 16, 2025
Docket No. M-2025-3057329

OCA-I-6 Please explain PPL's reasoning to create an Appliance Recycling component and Student Energy Education Component of the Resource Constrained Program that is separate from the Residential Program.

PPL Electric
Response The Company chose to align Residential and Resource Constrained Energy Efficiency Programs, including adding an Appliance Recycling and Student Energy Education component, to allow income-eligible customers to participate directly in components not previously available as a low-income program offering in Phase IV. Marketing communications and approaches will be updated and tailored to the communication needs of income-eligible communities to promote higher participation for this segment. Cross-program, component, and channel promotion will also be more effective, and the overall experience for income-eligible customers will be improved.

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company :
For Approval of its Phase V :
Energy Efficiency and Conservation Plan : Docket No. M-2025-3057325

Duquesne Light Company's Responses to Interrogatories and Requests for Production of
Documents
Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania (CAUSE-PA)

Set I

Response by: Dave Defide

CAUSE-PA-I-1

For June 2021 to date, please identify, disaggregated by month, as of the last day of the month, the number of residential accounts served by the company, disaggregated by the following customer segments and by electric heating versus non-electric-heating accounts. Please also indicate the source data relied upon for each response.

- a) All residential customers
- b) Estimated low income customers
- c) Confirmed low income customers
- d) CAP customers
- e) Confirmed low income customers, excluding CAP customers
- f) Residential customers, excluding confirmed low income customers and CAP customers

Please provide this data in a fully functional Excel spreadsheet

Response:

Please see the following Microsoft Excel file for the number of residential accounts served by the company disaggregated by customer segment and electric heating status. Please note that the company does not track any estimates of low-income customers and only reports on the number of confirmed low-income customers. The files correspond to the customer segments listed above. For example, file CAUSE-PA I-1 A, is the file responsible for all residential customers separated by electric heating status.

- CAUSE-PA I-1 A.XLSX
- CAUSE-PA I-1 C.XLSX

- CAUSE-PA I-1 D.XLSX
- CAUSE-PA I-1 E.XLSX
- CAUSE-PA I-1 F.XLSX

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

REPORT_PERIOD	TOTALS
202106	55433
202107	55361
202108	55363
202109	55491
202110	55311
202111	55496
202112	55658
202201	55820
202202	56043
202203	56614
202204	57484
202205	58235
202206	59054
202207	59577
202208	60175
202209	60619
202210	60741
202211	60816
202212	60434
202301	60690
202302	61137
202303	61515
202304	61728
202305	62665
202306	62890
202307	62983
202308	63262
202309	63402
202310	63750
202311	63914
202312	64037
202401	64332
202402	64534
202403	64641
202404	64659
202405	64662
202406	64202
202407	64188
202408	64050
202409	63992
202410	64212
202411	63996
202412	64069
202501	64256
202502	64435
202503	64262
202504	64418
202505	63986
202506	63578
202507	63782
202508	63804
202509	63951
202510	63992
202511	63743

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

REPORT_PERIOD	TOTALS
202106	9527
202107	9539
202108	9554
202109	9610
202110	9592
202111	9635
202112	9681
202201	9760
202202	9872
202203	10068
202204	10219
202205	10349
202206	10509
202207	10599
202208	10698
202209	10758
202210	10758
202211	10819
202212	10820
202301	10907
202302	11035
202303	11138
202304	11191
202305	11415
202306	11466
202307	11503
202308	11541
202309	11550
202310	11560
202311	11569
202312	11623
202401	11737
202402	11809
202403	11805
202404	11829
202405	11864
202406	11768
202407	11766
202408	11739
202409	11715
202410	11764
202411	11745
202412	11814
202501	11932
202502	12041
202503	11989
202504	12042
202505	11989
202506	11927
202507	12028
202508	12035
202509	12054
202510	12067
202511	12052

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company :
For Approval of its Phase V :
Energy Efficiency and Conservation Plan : Docket No. M-2025-3057325

Duquesne Light Company's Responses to Interrogatories and Requests for Production of Documents
Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania (CAUSE-PA)

Set II

Response by: David Defide

CAUSE-PA-II-20

Refer to Table 9: Estimated Savings and Participation on pages 144-184 of 213. Please reproduce Table 9 including only those measures that will be provided to low-income customers through the Company's targeted low-income programs. Provide measure name, 2026 TRM Measure Number, and the following metrics values for only low-income customers: Energy Savings (MWh), Summer Demand Reduction (MW), Winter Demand Reduction (MW) and Projected Participation. Provide these by year for Py18, PY19, PY20, PY21, PY22, and PY18-PY22 Total.

Response:

See the Excel workbook entitled "CAUSE-PA_Interrogs-II-20.xlsx" for the Company's response to CAUSE-PA-II-20. The response provides a version of Table 9 with measures solely from the Company's low-income programs.

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
LED Parking Garage and Canopy Fixtures and Retrofit Kits	2.1.1	Energy Savings (MWh)	32.82	32.82	32.82	32.82	32.82	164.10
		Summer Demand Reduction (MW)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0073
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	60	60	60	60	60	301
LED Replacement Lamps (Tubes)-2' & 4'	2.1.1	Energy Savings (MWh)	507.33	507.33	507.33	507.33	507.33	2,536.66
		Summer Demand Reduction (MW)	0.0693	0.0693	0.0693	0.0693	0.0693	0.3464
		Winter Demand Reduction (MW)	0.0668	0.0668	0.0668	0.0668	0.0668	0.3341
		Projected Participation	6,356	6,356	6,356	6,356	6,356	31,782
Lighting - LED A-Line	2.1.1	Energy Savings (MWh)	384.90	384.90	384.90	384.90	384.90	1,924.50
		Summer Demand Reduction (MW)	0.3620	0.3620	0.3620	0.3620	0.3620	1.8099
		Winter Demand Reduction (MW)	0.4336	0.4336	0.4336	0.4336	0.4336	2.1682
		Projected Participation	16,731	16,731	16,731	16,731	16,731	83,654
Lighting - LED Globe/Specialty	2.1.1	Energy Savings (MWh)	171.30	171.30	171.30	171.30	171.30	856.49
		Summer Demand Reduction (MW)	0.1609	0.1609	0.1609	0.1609	0.1609	0.8046
		Winter Demand Reduction (MW)	0.1928	0.1928	0.1928	0.1928	0.1928	0.9639
		Projected Participation	4,958	4,958	4,958	4,958	4,958	24,788
Lighting - LED Other	2.1.1	Energy Savings (MWh)	484.76	484.76	484.76	484.76	484.76	2,423.78
		Summer Demand Reduction (MW)	0.4018	0.4018	0.4018	0.4018	0.4018	2.0088
		Winter Demand Reduction (MW)	0.2975	0.2975	0.2975	0.2975	0.2975	1.4873
		Projected Participation	3,427	3,427	3,427	3,427	3,427	17,137
Lighting - LED Reflector	2.1.1	Energy Savings (MWh)	98.94	98.94	98.94	98.94	98.94	494.70
		Summer Demand Reduction (MW)	0.0935	0.0935	0.0935	0.0935	0.0935	0.4677
		Winter Demand Reduction (MW)	0.1121	0.1121	0.1121	0.1121	0.1121	0.5604
		Projected Participation	4,338	4,338	4,338	4,338	4,338	21,688
Residential Occupancy Sensors	2.1.2	Energy Savings (MWh)	0.04	0.00	0.00	0.00	0.00	0.04
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
LED Nightlight	2.1.3	Energy Savings (MWh)	42.58	42.58	42.58	42.58	42.58	212.88
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	2,065	2,065	2,065	2,065	2,065	10,326
Holiday Lights	2.1.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.00
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Air Source Heat Pump - SEER 17.5 / SEER2 16.3 HSPF 9.7 / HSPF2 8.2 +	2.2.1	Energy Savings (MWh)	65.73	65.73	65.73	65.73	65.73	328.66
		Summer Demand Reduction (MW)	0.0101	0.0101	0.0101	0.0101	0.0101	0.0506
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	115	115	115	115	115	575
Central Air Conditioner SEER 17.5 / SEER2 16.3	2.2.1	Energy Savings (MWh)	20.86	20.86	20.86	20.86	20.86	104.28
		Summer Demand Reduction (MW)	0.0145	0.0145	0.0145	0.0145	0.0145	0.0724
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	90	90	90	90	90	448
Ductless Mini-Split ENERGY STAR Cold Climate rated	2.2.1	Energy Savings (MWh)	203.58	203.58	203.58	203.58	203.58	1,017.88
		Summer Demand Reduction (MW)	0.0145	0.0145	0.0145	0.0145	0.0145	0.0725
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	85	85	85	85	85	424

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
Duct Sealing & Duct Insulation	2.2.10	Energy Savings (MWh)	1.11	0.00	0.00	0.00	0.00	1.11
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0003	0.0000	0.0000	0.0000	0.0000	0.0003
		Projected Participation	1	0	0	0	0	1
Air Handler Filter Whistles	2.2.11	Energy Savings (MWh)	0.01	0.00	0.00	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Energy Star Certified Smart Thermostat	2.2.12	Energy Savings (MWh)	177.38	177.38	177.38	177.38	177.38	886.90
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	310	310	310	310	310	1,551
Furnace Maintenance	2.2.13	Energy Savings (MWh)	0.01	0.00	0.00	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Furnace Circulation Fan - High Efficiency (ECM - Variable Speed)	2.2.4	Energy Savings (MWh)	4.48	4.48	4.48	4.48	4.48	22.38
		Summer Demand Reduction (MW)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0037
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	24	24	24	24	24	120
GSHP Desuperheaters	2.2.5	Energy Savings (MWh)	0.50	0.00	0.00	0.00	0.00	0.50
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Air Conditioner & Heat Pump Maintenance	2.2.6	Energy Savings (MWh)	0.49	0.00	0.00	0.00	0.00	0.49
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	2	0	0	0	0	2
Room A/C – Recycling	2.2.8	Energy Savings (MWh)	0.81	0.81	0.81	0.81	0.81	4.03
		Summer Demand Reduction (MW)	0.0022	0.0022	0.0022	0.0022	0.0022	0.0109
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	37	37	37	37	37	185
Window Heat Pump	2.2.9	Energy Savings (MWh)	1.96	0.00	0.00	0.00	0.00	1.96
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0006	0.0000	0.0000	0.0000	0.0000	0.0006
		Projected Participation	1	0	0	0	0	1
Heat Pump Water Heater	2.3.1	Energy Savings (MWh)	312.43	312.43	312.43	312.43	312.43	1,562.17
		Summer Demand Reduction (MW)	0.0282	0.0282	0.0282	0.0282	0.0282	0.1409
		Winter Demand Reduction (MW)	0.0520	0.0520	0.0520	0.0520	0.0520	0.2600
		Projected Participation	176	176	176	176	176	879
Smart Water Heater Controls	2.3.10	Energy Savings (MWh)	0.03	0.00	0.00	0.00	0.00	0.03
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Solar Water Heaters	2.3.2	Energy Savings (MWh)	1.88	0.00	0.00	0.00	0.00	1.88
		Summer Demand Reduction (MW)	0.0002	0.0000	0.0000	0.0000	0.0000	0.0002
		Winter Demand Reduction (MW)	0.0003	0.0000	0.0000	0.0000	0.0000	0.0003
		Projected Participation	1	0	0	0	0	1

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
Water Heater Tank Wrap	2.3.3	Energy Savings (MWh)	0.09	0.00	0.00	0.00	0.00	0.09
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Water Heater Temperature Setback	2.3.4	Energy Savings (MWh)	0.06	0.00	0.00	0.00	0.00	0.06
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Water Heater Pipe Insulation	2.3.5	Energy Savings (MWh)	17.57	17.57	17.57	17.57	17.57	87.86
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	207	207	207	207	207	1,034
Low-Flow Faucet Aerator	2.3.6	Energy Savings (MWh)	5.15	5.15	5.15	5.15	5.15	25.73
		Summer Demand Reduction (MW)	0.0008	0.0008	0.0008	0.0008	0.0008	0.0042
		Winter Demand Reduction (MW)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0077
		Projected Participation	413	413	413	413	413	2,066
Low-Flow Showerhead	2.3.7	Energy Savings (MWh)	7.79	7.79	7.79	7.79	7.79	38.96
		Summer Demand Reduction (MW)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0034
		Winter Demand Reduction (MW)	0.0013	0.0013	0.0013	0.0013	0.0013	0.0063
		Projected Participation	207	207	207	207	207	1,034
Thermostatic Showerhead	2.3.8	Energy Savings (MWh)	2.99	2.99	2.99	2.99	2.99	14.94
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	104	104	104	104	104	519
Drain Water Heat Recovery Units	2.3.9	Energy Savings (MWh)	0.23	0.00	0.00	0.00	0.00	0.23
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
ENERGY STAR Ceiling Fans	2.4.13	Energy Savings (MWh)	0.03	0.00	0.00	0.00	0.00	0.03
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Refrigerator / Freezer Recycling with and without Replacement	2.4.3	Energy Savings (MWh)	121.55	121.55	121.55	121.55	121.55	607.76
		Summer Demand Reduction (MW)	0.0202	0.0202	0.0202	0.0202	0.0202	0.1011
		Winter Demand Reduction (MW)	0.0179	0.0179	0.0179	0.0179	0.0179	0.0893
		Projected Participation	285	285	285	285	285	1,423
Low-Capacity Refrigerator / Freezer Recycling without Replacement	2.4.4	Energy Savings (MWh)	0.45	0.00	0.00	0.00	0.00	0.45
		Summer Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	2	0	0	0	0	2
ENERGY STAR Coolers	2.4.5	Energy Savings (MWh)	0.04	0.00	0.00	0.00	0.00	0.04
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Cooler Recycling with and without Replacement	2.4.6	Energy Savings (MWh)	0.31	0.00	0.00	0.00	0.00	0.31
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	2	0	0	0	0	2

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
Residential Induction Cooktop	2.4.7	Energy Savings (MWh)	0.01	0.00	0.00	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Advanced Power Strips	2.5.1	Energy Savings (MWh)	223.93	223.93	223.93	223.93	223.93	1,119.66
		Summer Demand Reduction (MW)	0.0313	0.0313	0.0313	0.0313	0.0313	0.1563
		Winter Demand Reduction (MW)	0.0403	0.0403	0.0403	0.0403	0.0403	0.2013
		Projected Participation	1,859	1,859	1,859	1,859	1,859	9,295
Air Sealing	2.6.1	Energy Savings (MWh)	36.94	36.94	36.94	36.94	36.94	184.70
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	35	35	35	35	35	174
Weather Stripping	2.6.2	Energy Savings (MWh)	17.16	17.16	17.16	17.16	17.16	85.80
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	207	207	207	207	207	1,034
Insulation, Basement Wall	2.6.3	Energy Savings (MWh)	54.61	54.61	54.61	54.61	54.61	273.05
		Summer Demand Reduction (MW)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0073
		Winter Demand Reduction (MW)	0.0017	0.0017	0.0017	0.0017	0.0017	0.0087
		Projected Participation	40	40	40	40	40	200
Insulation, Ceiling	2.6.3	Energy Savings (MWh)	165.51	165.51	165.51	165.51	165.51	827.55
		Summer Demand Reduction (MW)	0.0072	0.0072	0.0072	0.0072	0.0072	0.0361
		Winter Demand Reduction (MW)	0.0086	0.0086	0.0086	0.0086	0.0086	0.0432
		Projected Participation	168	168	168	168	168	840
Insulation, Exterior Wall	2.6.3	Energy Savings (MWh)	24.71	24.71	24.71	24.71	24.71	123.57
		Summer Demand Reduction (MW)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0037
		Winter Demand Reduction (MW)	0.0009	0.0009	0.0009	0.0009	0.0009	0.0045
		Projected Participation	16	16	16	16	16	79
Insulation, Floor	2.6.3	Energy Savings (MWh)	12.51	12.51	12.51	12.51	12.51	62.56
		Summer Demand Reduction (MW)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0037
		Winter Demand Reduction (MW)	0.0009	0.0009	0.0009	0.0009	0.0009	0.0044
		Projected Participation	8	8	8	8	8	40
Basement or Crawl Space Wall Insulation	2.6.4	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	20	20	20	20	20	100
ENERGY STAR Windows	2.6.5	Energy Savings (MWh)	0.00	0.00	0.00	0.00	0.00	0.01
		Summer Demand Reduction (MW)	0.0010	0.0010	0.0010	0.0010	0.0010	0.0051
		Winter Demand Reduction (MW)	0.0010	0.0010	0.0010	0.0010	0.0010	0.0052
		Projected Participation	1	1	1	1	1	6
Residential New Construction	2.7.1	Energy Savings (MWh)	4.47	0.00	0.00	0.00	0.00	4.47
		Summer Demand Reduction (MW)	0.0006	0.0000	0.0000	0.0000	0.0000	0.0006
		Winter Demand Reduction (MW)	0.0009	0.0000	0.0000	0.0000	0.0000	0.0009
		Projected Participation	1	0	0	0	0	1
ENERGY STAR Manufactured Homes	2.7.2	Energy Savings (MWh)	18.86	0.00	0.00	0.00	0.00	18.86
		Summer Demand Reduction (MW)	0.0026	0.0000	0.0000	0.0000	0.0000	0.0026
		Winter Demand Reduction (MW)	0.0037	0.0000	0.0000	0.0000	0.0000	0.0037
		Projected Participation	1	0	0	0	0	1

CAUSE-PA St. 1, Appendix B
Cited Discovery Responses

Measure	2026 TRM Measure Number	Metric	PY18	PY19	PY20	PY21	PY22	Total
Home Energy Reports	2.7.3	Energy Savings (MWh)	4,200.00	0.00	0.00	0.00	0.00	4,200.00
		Summer Demand Reduction (MW)	0.8900	0.0000	0.0000	0.0000	0.0000	0.8900
		Winter Demand Reduction (MW)	0.8900	0.0000	0.0000	0.0000	0.0000	0.8900
		Projected Participation	1	0	0	0	0	1
ENERGY STAR Pool Pumps	2.8.1	Energy Savings (MWh)	0.11	0.00	0.00	0.00	0.00	0.11
		Summer Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Winter Demand Reduction (MW)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Projected Participation	1	0	0	0	0	1
Single Speed Pool Pump Replacement	2.8.2	Energy Savings (MWh)	1.17	0.00	0.00	0.00	0.00	1.17
		Summer Demand Reduction (MW)	0.0005	0.0000	0.0000	0.0000	0.0000	0.0005
		Winter Demand Reduction (MW)	0.0006	0.0000	0.0000	0.0000	0.0000	0.0006
		Projected Participation	1	0	0	0	0	1
Photovoltaic (PV) Solar Generation	2.8.3	Energy Savings (MWh)	7.33	0.00	0.00	0.00	0.00	7.33
		Summer Demand Reduction (MW)	0.0023	0.0000	0.0000	0.0000	0.0000	0.0023
		Winter Demand Reduction (MW)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
		Projected Participation	1	0	0	0	0	1
Kit - Electric Hot Water Kit (SF or MF)	multiple	Energy Savings (MWh)	96.77	96.77	96.77	96.77	96.77	483.86
		Summer Demand Reduction (MW)	0.0101	0.0101	0.0101	0.0101	0.0101	0.0504
		Winter Demand Reduction (MW)	0.0186	0.0186	0.0186	0.0186	0.0186	0.0931
		Projected Participation	598	598	598	598	598	2,992
Kit - Gas Hot Water Kit (SF or MF)	multiple	Energy Savings (MWh)	83.48	83.48	83.48	83.48	83.48	417.40
		Summer Demand Reduction (MW)	0.0079	0.0079	0.0079	0.0079	0.0079	0.0396
		Winter Demand Reduction (MW)	0.0146	0.0146	0.0146	0.0146	0.0146	0.0731
		Projected Participation	908	908	908	908	908	4,540

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Electric Utilities Corporation :
For Approval of its Act 129 Phase V : Docket No. M-2025-3057329
Energy Efficiency and Conservation Plan :

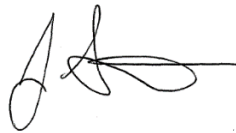
**THE COALITION FOR AFFORDABLE UTILITY SERVICE AND ENERGY
EFFICIENCY IN PENNSYLVANIA (CAUSE-PA)
TESTIMONY VERIFICATION OF JIM GREVATT**

VERIFICATION

I, Jim Grevatt, hereby state that the facts set forth in CAUSE-PA St. 1, Direct Testimony of Jim Grevatt, are true and correct to the best of my knowledge, information, and belief, and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements made herein are subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsifications to authorities).

January 27, 2026

Date



Jim Grevatt
Witness for CAUSE-PA

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Electric Utilities Corporation :
For Approval of its Act 129 Phase V : Docket No. M-2025-3057329
Energy Efficiency and Conservation Plan :

**PREPARED HEARING EXHIBIT LIST OF THE COALITION FOR AFFORDABLE
UTILITY SERVICES AND ENERGY EFFICIENCY IN PENNSYLVANIA**

The Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania (CAUSE-PA) intends to move for admission of the following evidence at the February 3, 2026, evidentiary hearing in the above-captioned matter:

- Direct Testimony of Jim Grevatt on Behalf of the Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania (CAUSE-PA Statement 1)
 - 52 pages of written testimony
 - Appendix A: Resume of Jim Grevatt & List of Proceedings in which Jim Grevatt has testified
 - Appendix B: Cited Discovery Responses
- Rebuttal Testimony of Jim Grevatt on Behalf of the Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania (CAUSE-PA Statement 1-R)
 - 5 pages of written testimony
- Verification of Jim Grevatt Direct Testimony
- Verification of Jim Grevatt Rebuttal Testimony

Respectfully Submitted,
PENNSYLVANIA UTILITY LAW PROJECT
Counsel for CAUSE-PA



John W. Sweet, Esq., PA ID: 320182
118 Locust Street
Harrisburg, PA 17101
pulp@pautilitylawproject.org

Dated: February 3, 2026

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Energy Company :
for Approval of Its Act 129 Phase V : Docket No. M-2025-3057329
Energy Efficiency and Conservation Plan :

REBUTTAL TESTIMONY OF JIM GREVATT

ON BEHALF OF

THE COALITION FOR AFFORDABLE UTILITY SERVICES AND
ENERGY EFFICIENCY IN PENNSYLVANIA (“CAUSE-PA”)

January 29, 2026

PREPARED REBUTTAL TESTIMONY OF JIM GREVATT

Q. Please state your name, occupation, and business address.

A. My name is Jim Grevatt. I am a Managing Consultant at Energy Futures Group, located at 10298 Route 116, Hinesburg, VT 05461.

Q: Did you previously submit testimony in this proceeding?

A: Yes. I submitted direct testimony pre-marked as CAUSE-PA Statement 1 on behalf of the Coalition for Affordability Utility Services and Energy Efficiency in Pennsylvania (CAUSE-PA).

Q: What is the purpose of your rebuttal testimony?

A: My rebuttal testimony responds to the direct testimony of John M. Costlow, expert witness for the Regenerative Energy Initiative, formerly known as the Sustainable Energy Fund or SEF.¹ I address Mr. Costlow's proposals that PPL Electric Company (PPL) offer tiered energy efficiency (EE) rebates based on volumetric usage, rather than based on income level, and that PPL work with SEF to restructure its proposed CSP third-party program to offer financing for energy efficiency improvements to all ratepayers at a 3.99% interest rate, rather than providing 0% financing to moderate income (150%-250% FPL) customers.

As noted, my rebuttal testimony specifically addresses these discrete issues raised by Mr. Costlow and is not intended to address every issue raised or otherwise discussed in the direct testimonies submitted by expert witnesses in this proceeding. Absence of a response to any other specific recommendation or position of any witness does not indicate my agreement. I stand on the evaluations, analyses, and recommendations contained in my direct testimony.

¹ SEF St. 1.

1 **Q: Please summarize the testimony to which you are responding.**

2 A: In his direct testimony, Mr. Costlow examines, among others, PPL’s proposals contained
3 in its proposed Phase V Plan to offer income-based tiered rebates and CSP third party financing
4 of energy efficiency improvements for moderate income (150%-250% FPL) customers.² Mr.
5 Costlow recommends that PPL “offer tiered rebates based on volumetric consumption levels,”
6 rather than based on income level as PPL proposed.³ Mr. Costlow also asserts that PPL could offer
7 ratepayers twice as many subsidized loans at an interest rate of 3.99% than it could at 0%, and
8 recommends that PPL “work with SEF and a Third-Party financing company like the National
9 Energy Improvement Fund to structure the offering for all ratepayers,” rather than directing the
10 plan at moderate-income customers.⁴

11 **Q: What is your response to Mr. Costlow’s recommendation that PPL offer tiered**
12 **incentives based on volumetric usage rather than based on income level?**

13 A: The tiered incentive model suggested by Mr. Costlow is an ill-conceived idea that would
14 contradict Act 129’s requirements for equitable treatment of low income households and would
15 all but guarantee that low-income customers would not be able to afford to participate in PPL’s
16 EE programs. Mr. Costlow states that “ratepayers who purchase more from PPL and contribute
17 more to the Act 129 EE&C program should receive a larger rebate”⁵ but this ignores the underlying
18 premise of energy efficiency programs: that there are barriers that prevent customers from
19 undertaking EE actions on their own that programs should address. In the case of low-to-moderate
20 income households the cost of making EE upgrades is a primary barrier – they simply do not have
21 the funds to pay for EE upgrades. This should be obvious from the evidence I provided in my

² SEF St. 1 at 3:6-7.

³ Id. at 4:9-10.

⁴ Id. at 8:2-3, 10-11.

⁵ Id. at 4:10-12.

1 testimony, including statistics on the average incomes of low-income households served by PPL
2 as well as the much higher rates of arrearages and disconnections they experience. It is also
3 supported by independent research: the American Council for an Energy Efficient Economy
4 (ACEEE) says that “many low-and moderate-income (LMI) households cannot afford the full cost
5 of upgrades” and recommends that “[t]o reduce the upfront costs of energy efficiency upgrades for
6 LMI households, program administrators should first enroll eligible households in no- or low-cost
7 weatherization programs.”⁶ Mr. Costlow’s recommendation would not address the primary cost
8 barrier faced by low-income households, thus depriving them of the ability to implement EE
9 actions at no cost. It is more akin to a reward system for using more electricity than a strategy for
10 advancing EE and would fail to ensure that all segments of PPL’s customer base, including low
11 income households, would have a reasonable opportunity to benefit from the Company’s
12 programs.

13 As I explained in my direct testimony, PPL is required to include specific energy efficiency
14 measures for low income households and to derive a specific percentage of its energy savings from
15 programs directed at low-income customers.⁷ Removing enhanced incentives for low income
16 households and assigning them based on usage could prevent PPL from achieving these goals and
17 would undercut PPL’s ability to equitably serve its low-income customers through its EE&C Plan.

⁶ Mah, Jasmine et al. How to Pay for Low-and-Moderate-Income Home Energy Retrofits, ACEEE September 2025.
https://www.aceee.org/sites/default/files/pdfs/how_to_pay_for_low_and_moderate-income_home_energy_retrofits.pdf.

⁷ CAUSE-PA St. 1 at 9-13.

1 **Q: What is your response to Mr. Costlow’s proposal that PPL should work with SEF and**
2 **a third-party financing company to provide subsidized financing for energy efficiency**
3 **improvements to all ratepayers?**

4 A: First, let me say in response to the question that I agree with Mr. Costlow’s position that
5 there are significant challenges with moderate-income financing that must be addressed with any
6 third-party financing model. I agree that “[a]t the lower end of the income level, there are going to
7 be significant issues with traditional underwriting”⁸ and that “with only moderate-income
8 ratepayers, the loan pool will be significantly more risky than a loan pool of all ratepayers. As a
9 result, the core interest rate will likely be considerably higher.”⁹

10 **Q: What impact would a higher interest rate have on program costs?**

11 A: I agree with Mr. Costlow that a higher interest rate would drive up the cost of “buying
12 down” the interest rates to customers from the initial market rate to either the 0% rate proposed by
13 the Company or the 3.99% rate suggested by Mr. Costlow. I note that in Mr. Costlow’s example
14 he does not calculate the cost of buying down a \$10,000 loan from the 12.99%-14.99% he
15 speculates would be the rate the Company would get for loans to moderate income households,
16 but the cost would be significantly more.

17 **Q: Does Mr. Costlow address the risk that moderate income households might save less**
18 **in their monthly electric bill than they are liable for in the monthly loan payment, and thus**
19 **have worse cash flow in spite of the EE project?**

20 A: Mr. Costlow notes that the Company anticipates providing “no protection for ratepayers”¹⁰
21 to prevent such a scenario. Thus, participating households might find themselves surprised to be

⁸ SEF St. 1 at 6:7-8.

⁹ Id. at 6:7-8.

¹⁰ Id. at 7:6.

1 in a worse financial situation when they thought the EE project would save them money. This
2 could have terrible outcomes for moderate income families. I recommend that any financing
3 program contemplated by the Company, whether developed by the CSP, through SEF and the
4 National Energy Improvement Fund, or through any other means should carefully consider the
5 costs of providing reduced-interest financing and whether it might be better to simply use those
6 funds to increase incentives rather than saddle vulnerable households with loans they might not be
7 able to pay. If the Company does move forward with financing it must ensure that it does not
8 increase financial risks for vulnerable households by offering accurate forecasts of energy savings,
9 guaranteeing loans if households are not able to make their payments, and committing not to record
10 unpaid customer loans so as not to worsen customers' credit ratings. That said, in my view, the
11 money allocated by the Company to buy down interest rates would be better spent on further
12 enhancing the incentives for this group of customers to make the measures more affordable.

13 **Q: Does this conclude your rebuttal testimony?**

14 **A:** Yes.

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Electric Utilities Corporation :
For Approval of its Act 129 Phase V : Docket No. M-2025-3057329
Energy Efficiency and Conservation Plan :

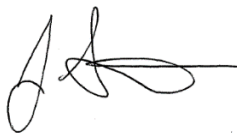
**THE COALITION FOR AFFORDABLE UTILITY SERVICE AND ENERGY
EFFICIENCY IN PENNSYLVANIA (CAUSE-PA)
TESTIMONY VERIFICATION OF JIM GREVATT**

VERIFICATION

I, Jim Grevatt, hereby state that the facts set forth in CAUSE-PA St. 1-R, Rebuttal Testimony of Jim Grevatt, are true and correct to the best of my knowledge, information, and belief, and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements made herein are subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsifications to authorities).

February 3, 2026

Date



Jim Grevatt
Witness for CAUSE-PA

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PPL Electric Utilities	:	
Corporation for Approval of its Act 129	:	
Phase V Energy Efficiency and	:	Docket No.: M-2025-3052826
Conservation Plan	:	

**DIRECT TESTIMONY
OF JOHN COSTLOW**

DATED: January 20, 2026

DIRECT TESTIMONY OF JOHN M. COSTLOW

Q. Please state your full name and business address.

A. My name is John M. Costlow. My business address is 4250 Independence Drive, Suite 100, Schnecksville, PA 18078.

Q. By whom are you employed and in what capacity?

A. I am the President and Chief Executive Officer of the Regenerative Energy Initiative (“REI”), formerly known as the Sustainable Energy Fund or SEF. Florida Public Utilities previously employed me as Manager, Marketing and Energy Conservation.

Q. What are your duties as President of REI?

A. As President and Chief Executive Officer for REI, I am responsible for managing the ongoing operations of the organization whose mission is to promote, research, and invest in clean and renewable energy technologies, energy conservation, energy efficiency, energy education, and sustainable energy enterprises that provide opportunities and benefits for PPL Electric ratepayers, including low-income ratepayers. REI focuses on the entire spectrum of energy systems and restorative energy environments. It assists energy users in overcoming barriers and challenges to harvesting, converting, distributing, and utilizing energy in an environmentally responsible manner.

Q. What is your educational background?

A. I received a Master of Executive Leadership from Liberty University, a Bachelor of Science Degree in Organizational Management from Palm Beach Atlantic University, and I am a graduate of the U.S. Navy Nuclear Power School where my studies focused on

1 nuclear physics, reactor principles, electrical power generation, electronic monitoring and
2 controls.

3 **Q. What professional certifications or positions do you hold?**

4 A. I have received professional certifications as a Certified Carbon Reduction Manager, a
5 Certified Sustainable Development Professional, a Performance Contracting and Funding
6 Professional, a Certified Passive House Consultant, and a Certified Renewable Energy
7 Professional.

8 **Q. Have you previously testified or provided comments before the PUC?**

9 A. Yes. I entered comments to the working group discussion at Docket No. M-2008-2069887
10 relating to the implementation of ACT 129 and entered comments at Docket No. M-2012-
11 2289411 and M-2014-2424864 concerning the design and implementation of any future
12 Act 129 EE&C programs. In addition, I have participated in and entered comments to the
13 Commission's Low Income Working Group and Fuel Switching Working Group. I
14 testified in the proceeding that established PPL Electric Utilities Corporation's ("PPL
15 Electric" or "Company") EE&C Plan (at Docket No. M-2009-2093216). I also testified in
16 PPL Electric's Time of Use Rate proceedings at Docket Numbers R-2009-2122718, R-
17 2011-2264771, P-2013-2389572, and M-2016-2578051. Rate increase proceedings at
18 Docket Numbers R-2010-2161694 and R-2012-229057, R-2015-246275 and the default
19 service proceedings at Docket No. P-2012-2302074 and P-2014-2417909. AEC
20 proceeding Docket at R-2008-2060309. I submitted testimony in the Distributed Energy
21 Resource Management Plan at Docket No. P-2019-3010128 In addition, I testified in the
22 proceeding that established UGI Utilities – Electric Division's Energy Efficiency and
23 Conservation Plan (at Docket No. M-2010-2210316). I have also submitted comments and

1 testimony on PPL's EE&C Phase II Plan at Docket No. M-2012-2334388, PPL's EE&C
2 Phase III Plan at Docket M-2015-2515642. I have submitted testimony in PPL's current
3 rate case at Docket No. R-2025-3057164 *et al.*

4 **Q. Mr. Costlow, please describe the subject matter of your testimony in this proceeding?**

5 A. My testimony concerns PPL Electric's proposed Act 129¹ Phase V Energy Efficiency and
6 Conservation Plan ("Plan"), insofar as it relates to the proposed Tiered Rebates, CSP Third
7 Party financing, and proposed rebates to encourage electrification.

8 **Q. In your opinion, is PPL Electric's EE&C plan as filed in the best interest of the**
9 **ratepayers?**

10 A. Many of PPL's initiatives are congruent with the goals of Act 129, but my comments
11 specifically relate to improvements to the Plan and the lack of specificity. These comments
12 relate to the tiered rebates, CSP Third-Party financing, and electrification.

13 **Q. What concern(s) do you have with regards to the programs being offered?**

14 A. I have three primary concerns with the Plan. My concerns relate to the proposed tiered
15 rebates, CSP third-party financing, and the proposal to promote electrification.

¹¹ Docket No. M-2025-3057329

Tiered Rebates

Q. With respect to your first concern, regarding Tiered Rebates, can you be more specific about the issues you see?

A. Yes. PPL Electric proposes offering tiered rebates for low-income (150% of the poverty level), moderate-income (250% of the poverty level), and all other residential ratepayers but these plans lack specificity and true incentives based on consumption.

Q. With respect to your first concern, regarding Tiered Rebates, what do you recommend be done to resolve your concerns?

A. I recommend that PPL Electric continue with the concept of tiered rebates, but instead offer tiered rebates based on volumetric consumption levels. Essentially, ratepayers who purchase more from PPL and contribute more to the Act 129 EE&C program should receive a larger rebate. This not only targets high-use ratepayers but also targets low-income ratepayers, as I demonstrated in PPL Electric's recent rate case: lower-income ratepayers consume more electricity per meter than non-low-income ratepayers. In this way, the program would not eliminate but reduce the socialization of costs across residential ratepayers.

All Electric Homes

Q. Please describe your second concern with PPL's Plan.

A. PPL Electric is proposing to "prioritize the creation of all-electric homes with additional incentives for builders" which is self-serving and antithetical to the goals of Act 129.²

² PPL Electric EE&C Plan p.29

1 **Q. What are your concerns regarding the all-electric home?**

2 A. I have two concerns: (1) that this is a load-building program for PPL Electric and should
3 be paid for out of shareholder funds, not funds provided by ratepayers, and (2) what
4 purpose do all-electric homes serve? Electricity is the costliest fuel per MMBtu; it is
5 primarily generated from coal, natural gas, and nuclear sources, so it is not environmentally
6 preferred at this point.

7 **CSP Third-Party Financing**

8 **Q. Please describe your third concern with PPL's Plan.**

9 A. The CSP third-party program, as outlined by PPL Electric, is destined to fail based on a
10 general lack of understanding of consumer and remarkably low to moderate income
11 financing.

12 **Q. Do you have experience with financing energy efficiency projects?**

13 A. Yes, Sustainable Energy Fund has been a leader in energy efficiency and renewable energy
14 financing for more than 25 years. As Director of Technical Services of SEF, I directly
15 oversaw the organization's financing operations. Now, as President, I approve financing
16 mechanisms for residential and commercial customers.

17 **Q. Are you a proponent of financing energy efficiency improvements?**

18 A. Yes, many energy efficiency improvements are cash flow positive without the use of
19 rebates or government incentives. Unfortunately, customers with FICO Scores below 680-
20 700 find financing costly; additionally, lower-income ratepayers have difficulty meeting
21 debt-to-income thresholds.

Q. When PPL Electric references moderate-income customers in its proposal, what are the income levels they are referring to?

A. Moderate income ratepayers, as defined by PPL Electric, refer to ratepayers with a household income between 150% and 250% of the level of poverty, as determined by the Department of Health and Human Services.³ The table below sets forth these income levels

People in Households	Poverty	Bottom Threshold	Top Threshold
One	\$15,650	\$23,475	\$39,125
Two	\$21,150	\$31,725	\$52,875
Three	\$26,650	\$39,975	\$66,625
Four	\$48,225	\$48,225	\$80,375
Each additional person	\$5,500		

Q. What concerns do you have regarding income levels?

A. At the lower end of the income level, there are going to be significant issues with traditional underwriting, particularly the debt-to-income ratio.

Q. In the proposed financing program, are there any guardrails to prevent and or alert moderate-income ratepayers that, after installing the energy efficiency measure or measures, their total monthly expenditure (loan payment plus utility bill) will exceed their previous total monthly spending?

A. No, in fact, in response to SEF I-4(e), PPL Electric states “the Company cannot anticipate whether and when financing payments may exceed project energy benefits”. If the Company, with all its engineering talent and expertise with energy efficiency projects and

³ PPL Electric response to SEF I-3(a)

utility billing, cannot “anticipate” when total expenditures will increase, what hope does a ratepayer have of determining whether their total spending will increase?

Q. Has PPL Electric proposed putting in place any protections for ratepayers or communicating that ratepayers' total expenditures may increase?

A. No. PPL Electric posits that the CSP subcontractors (financing company) will be responsible for all communication. So, there is no protection for ratepayers.⁴

Q. Do you have additional concerns as a result of discovery?

A. Yes, PPL Electric proposes to offer 0% interest rate buy-downs for a limited period of time. A 0% interest rate buy-down on a typical market loan at 7.99-8.99% is expensive compared to other alternatives and is unnecessary to encourage participation by ratepayers with few options. The payment difference between 0% financing and 3.99% or 4.99% is not that significant, but the difference in the rate buydown is.

Q. What is the difference in the payment and buydown between a 0% and a 3.99% loan?

A. If we calculate the difference between a 0%, 3.99%, and 7.99% loans for \$10,000 at 60 months, the buydown for a 0% loan on a 7.99% rate is \$2,162.97, or more than twice the 3.99% rate at \$1,047.21, while the payment difference between 0% and 3.99% is \$17.45 per month.

Interest Rate	Payment	Buydown
0%	\$166.67	\$2,163
3.99%	\$814.12	\$1,047.21
7.99%	\$202.72	\$0

⁴ PPL Electric response to SEF I-4(e)

1 **Q. What do you conclude from these calculations?**

2 A. Twice as many loans could be offered at a 3.99% rate, as compared to a 0% interest rate,
3 and still be significantly less than the market rate.

4 **Q. Do you have any other concerns?**

5 A. Yes, with only moderate-income ratepayers, the loan pool will be significantly more
6 risky than a loan pool of all ratepayers. As a result, the core interest rate will likely be
7 considerably higher in the range of 12.99 to 14.99 percent, further driving up buydown
8 costs.

9 **Q. What changes do you recommend?**

10 A. I recommend PPL Electric work with SEF and a Third-Party financing company like the
11 National Energy Improvement Fund to structure the offering for all ratepayers.

12 **Q. Does this conclude your testimony?**

13 A. Yes. However, I reserve the right to supplement my testimony based on discovery
14 responses and other parties' testimonies.

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Petition of PPL Electric Utilities Corporation :
for Approval of its Act 129 Phase V Energy : Docket No. M-2025-3057329
Efficiency and Conservation Plan :
:
:
:
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:

TESTIMONY

OF

JEANEEN A. ZAPPA

On Behalf of

Keystone Energy Efficiency Alliance

Topics Addressed:

5

January 20, 2025

1
2

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8 **VI. Coordination with electrification programs.....**

9 **VII. Workforce development.....**

1

I. IDENTIFICATION**Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS?**

A. My name is Jeaneen Ann Zappa, and I am the Executive Director at the Keystone Energy Efficiency Alliance (“KEEA”), a 501(c)(6) trade association of 81 energy efficiency organizations who do business in the Commonwealth of Pennsylvania. Our mailing address is 614 S. 4th Street, Suite #307, Philadelphia, PA 19147. I also serve as the Executive Director of the affiliated 501(c)(3) nonprofit organization, the Energy Efficiency Alliance (“EEA”), which is dedicated to advancing energy efficiency in the Mid-Atlantic through education and awareness.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. My testimony today is submitted on behalf of KEEA.

Q. PLEASE BRIEFLY DESCRIBE YOUR QUALIFICATIONS?

A. My career experience spans roles in the for-profit, public, and not-for-profit sectors. Since July of 2021, I have served as the Executive Director for KEEA, after joining the organization one year prior. For the past five years, I have worked with our trade association energy efficiency business members in Pennsylvania and New Jersey to understand and represent their viewpoints and concerns. These energy efficiency member businesses focus on areas spanning from legal counsel, equipment manufacturing, contractors, and program implementers in the residential, commercial, and industrial sectors. Our work focuses on critical industry shaping trends and their impacts on businesses and individuals.

Prior to joining KEEA, I served as the Executive Director of Conservation Consultants Inc. ("CCI") for seven years. CCI implemented utility programs with a focus on residential energy efficiency and healthy home performance programs. CCI worked with multiple utility companies in the Commonwealth, including Columbia Gas of Pennsylvania, Peoples Gas Company, and Duquesne Light Company on both Act 129 and LIURP programming. CCI also implemented other programs that included those focused on home repairs and energy retrofits, energy efficiency marketing, and comprehensive home energy audits. Prior to joining CCI my roles include serving as the first Sustainability Manager for Allegheny County, where I was part of a large ESCO project team for County facilities. My early career involved work in marketing for the health care and technology sectors.

I hold a dual degree in Magazine Journalism and Marketing from Syracuse University and an MBA from the University of Pittsburgh. My complete resume is attached to my testimony as Exhibit KEEA-1.

Q. HAVE YOU PRESENTED TESTIMONY IN PROCEEDINGS BEFORE THIS OR OTHER REGULATORY BOARDS?

A. Yes. I presented verbal testimony before the Pennsylvania PUC as part of a hearing on Resource Capacity (Docket No. M-2024-3051988) held on November 25, 2024 with subsequent written testimony submitted in January 2025.

II. INTRODUCTION AND SUMMARY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony will be focused on addressing certain aspects of PPL Electric Utilities Corporation's ("PPL" or the "Company") Act 129 Phase V Energy Efficiency and Conservation Plan Filing ("Phase V Plan"). Those aspects are the importance of maximizing ratepayer-funded energy efficiency, health and safety barrier mitigation, coordination of marketing activities, coordination of electrification programs, and workforce development and training.

Q. ARE YOU SPONSORING ANY EXHIBITS IN THIS PROCEEDING?

A. Yes. I am sponsoring the following exhibits:

- Exhibit KEEA-1 – Resume of Jeaneen Zappa

- Exhibit KEEA-2 - H&S Budgets Workpaper

Q. PLEASE SUMMARIZE YOUR TESTIMONY AND RECOMMENDATIONS.

A. First I discuss the importance of ratepayer-funded energy efficiency and the myriad benefits it provides the Commonwealth. I then discuss the importance of health and safety barrier mitigation and recommend that PPL allocate funding, as their peers did, specifically for the mitigation of health and safety barriers that are preventing the

households with the greatest need for energy savings from participating in their programs. Next, I discuss how PPL can coordinate marketing activities with other EDCs to better leverage program outcomes and utilize funding to spread energy efficiency messaging to as many residents of the Commonwealth as possible. I then explore how PPL should coordinate efforts with other state electrification programs to more robustly serve their customers by ensuring that all incentives available are applied toward their energy saving projects. I finish up with recommendations on how PPL should address workforce development and more specifically provide training to the workforce on the most impactful areas of need to better serve their customers and lead to deeper energy savings. In summary, I recommend that, as part of its Phase V Plan, PPL should:

1. Set aside funding of up to \$2. million, (5.1%) of its low income program for health and safety barrier mitigations;
2. Include an assessment in its low income program that aligns with the Healthy Home Evaluator evaluations from the Building Performance Institute and adopt the Healthy Home Evaluator certification as a requirement for contractors;
3. Align with the other Act 129 EDCs around developing and supporting a single point of entry for their Act 129 programs under a single umbrella label;
4. Include in their annual report the to the PUC a summary of their outreach activities to each sector (small business, commercial and industrial, residential, and low income);
5. Conduct a survey to track awareness of Act 129 programs and to publicly share the findings and use this information as a basis for further considering marketing coordination;
6. Coordinate with the Pennsylvania Department of Environmental Protection (“PA DEP”) on exactly how incentive “braiding” will occur, including ways to streamline application processes and reduce duplicative data collection;
7. Make efficient heat pump and heat pump water heater (“HPWH”) incentives available to customers regardless of the fuel used for space and water heating prior to the purchase of the new high efficiency equipment;

8. Enter into a formal data sharing partnership between the PA DEP, Resource Innovations, EDCs and others to streamline data flow and expedite braided incentive processing, and provide the formal partnership plan to interveners in this docket;
9. Report on the results of this formal coordination plan in the semi-annual and annual reports to the PUC to include metrics on the number of coordinated projects by measure and additional funds leveraged due to coordination;
10. Cover any costs for ASHRAE Level 2 audits not covered by the HER program for participants in both programs;
11. Expand the proposed enhanced trade ally network component beyond heat pumps, to include heat pump water heater technology training and trade ally inclusion;
12. Coordinate with the other Act 129 EDCs and state programs, such as the PA DEP's HEAR and TREC, to combine resources to deliver workforce development training on the focus areas referenced above

III. IMPORTANCE OF MAXIMIZING RATEPAYER FUNDED ENERGY EFFICIENCY

Q. WHAT IS THE IMPORTANCE OF ENERGY EFFICIENCY TO THE ECONOMY OF PENNSYLVANIA?

A. Energy efficiency has a significant economic impact on the Commonwealth of Pennsylvania, and continued investment through Act 129 will deliver both direct and indirect benefits to its businesses and residents. The energy efficiency industry employs 76,289 people in the Commonwealth, making it the largest component of Pennsylvania's clean energy sector jobs.¹ But it's not just the clean energy sector. Energy efficiency is the largest employer in all energy sectors in the Commonwealth – including energy transmission & distribution, nuclear, and traditional fossil fuels.² Additionally, the energy efficiency sector is a strong driver for small business growth and success, with nearly

¹ E2, *Clean Jobs Pennsylvania 2025* (Nov. 24, 2025) <https://e2.org/reports/clean-jobs-pennsylvania-2025/>.

² Building Performance Association, *Energy Efficiency Jobs in America – Pennsylvania* (Dec. 2025) <https://building-performance.org/education/resources/pennsylvania-energy-efficiency-jobs-in-america-report/>.

93% of energy efficiency businesses employing fewer than 100 people.³ Each job and each business sends a ripple of economic activity through Pennsylvania from wages, payroll taxes and direct expenditures on goods and services. Moreover, energy efficiency has been a growing jobs sector for the past several years.

Q. WHAT IS THE IMPORTANCE OF ENERGY EFFICIENCY TO THE PEOPLE OF PENNSYLVANIA?

A. Energy efficiency plays a critical role in delivering multiple benefits to the people of Pennsylvania. Energy savings and the associated cost savings are perhaps the biggest direct benefit of energy efficiency in the Commonwealth. In the most recent measured year of Act 129 ('23-'24), every dollar spent on energy efficiency resulted in a return of \$1.44 in benefits, including avoided energy costs and operation and maintenance savings.⁴ Across the current five-year phase, Act 129 programs are expected to achieve nearly a 3.1% cumulative reduction in annual electricity use statewide, which directly lowers participant bills.⁵ According to a recent RMI Strategic Insight, energy efficiency saves the average Pennsylvanian \$500 annually.⁶ Notably, Pennsylvania's energy cost savings is just under half of the national average savings of \$1,000 per person from energy efficiency, suggesting that Pennsylvania's energy efficiency programs have room to achieve higher savings still.⁷ Weatherization programming plays a unique role as an economic revitalization tool for low-income communities. The return on investment for

³ *Id.*

⁴ Public Utility Commission, *SWE Final Annual Report: Act 129 Program Year 15*, 13 (Dec. 14, 2024) https://www.puc.pa.gov/media/3262/swe_py15_final_annual_report120424.pdf.

⁵ *Id.* at 15.

⁶ RMI, *How to Save Money for All Americans: Efficiency* (Apr. 14, 2025) <https://rmi.org/how-to-save-money-for-all-americans-efficiency/>.

⁷ *Id.*

these programs is compelling, where every \$1.00 invested returns \$1.72 in energy benefits, contributing to an annual household energy cost savings of over \$372.⁸

Commercial properties can also make improvements through energy efficiency and reap significant savings. According to the US Environmental Protection Agency, commercial properties can reduce their energy consumption by up to 50% through energy efficiency alone.⁹ The Department of Energy reports that commercial buildings achieve an average energy savings of 30% when they implement comprehensive energy efficiency measures.¹⁰ As evidence of this, the 540 commercial property owners participating in the Pittsburgh area 2030 District saw a 26.5% energy reduction and a \$56M combined reduction in their energy bills in 2023.¹¹

Energy efficiency also reduces carbon emissions, which improves public health. The Pittsburgh 2030 District saw a 52.3% reduction in carbon across participating commercial properties, and the PA PUC's own report shows 2,115,577 short tons of avoided carbon dioxide emissions so far in Phase IV.¹² Public health research shows that carbon emissions reduction strategies significantly enhance human health, improving air quality,

⁸ U.S. Dept. of Energy, *Weatherization Assistance Program Fact Sheet*, 1 (June 2022) https://www.energy.gov/sites/default/files/2022-06/wap-fact-sheet_0622.pdf.

⁹ CIM, *Energy Efficiency in Commercial Buildings* (Apr. 7, 2025) <https://www.cim.io/blog/energy-efficiency-in-commercial-buildings#:~:text=The%20U.S.%20Department%20of%20Energy%20reports%20that%20commercial,savings%20directly%20boost%20operational%20budgets%20and%20profit%20margins.>

¹⁰ *Id.*

¹¹ Green Building Alliance, *Pittsburgh 2030 District: 2024 Annual Progress Report* (May 2025) https://www.gba.org/wp-content/uploads/Pittsburgh-2030-District-2024-Progress-Report_Reduced-Size-002.pdf.

¹² Compiled from Act 129 Phase IV SWE Annual Reports, PY13-16. <https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/act-129-statewide-evaluator-swe/>.

and reducing mortality and morbidity.¹³ Energy consumption and energy production generate the highest amounts of Greenhouse Gas (GHG) emissions, including Carbon Dioxide in Pennsylvania. Electricity generation contributes 29% of the state’s GHG total, and the industrial sector’s energy consumption contributes 31% of the total.¹⁴

Q. WHAT ARE SOME OTHER WAYS THAT ENERGY EFFICIENCY BENEFITS THE COMMONWEALTH?

A. Energy efficiency reduces the strain on our energy grid. In a time of rising electricity rates with increased demand on the grid, reducing energy usage provides a twofold benefit – both as a cost savings to the rate payer and as a way to reduce load on the already strained power grid. First, costs to ratepayers are indeed higher: Pennsylvania ranked 14th on a list of the most expensive for energy in the nation.¹⁵ The problem is projected to escalate with rising forecasts for electrical demand. PJM estimates an increased load of 32 GW from 2024 to 2030.¹⁶ Pennsylvanians face higher electricity bills, with the average charge hitting 20.49 cents/kWh in October of 2025 for the residential sector.¹⁷ This follows a long upward climb in rates, particularly during periods of summer peak demand. August bills in all states increased from 2015 to 2023 by an

¹³ Abdala SA, Khomsi K, Houdou A, *et al.* Emission Reduction strategies and health: a systematic review on the tools and methods to assess co-benefits. *BMJ Open* (Dec. 9, 2024) <https://pmc.ncbi.nlm.nih.gov/articles/PMC11628954/>.

¹⁴ *Pennsylvania Greenhouse Gas (GHG) Inventory*, <https://www.pa.gov/agencies/dep/residents/climate-change/ghg-inventory>.

¹⁵ Nicole Spector, “Energy Bill Breakdowns in All 50 States” *GoBankingRates* (Apr. 8, 2025) https://www.gobankingrates.com/money/economy/energy-bill-breakdowns-in-all-50-states/?hyperlink_type=manual&utm_term=incontent_link_4&utm_campaign=1319350&utm_source=yahoo.com&utm_content=6&utm_medium=rss.

¹⁶ *2025 Long-Term Load Forecast Report Predicts Significant Increase in Electricity Demand*, PJM Inside Lines (Jan. 30, 2025) <https://insidelines.pjm.com/2025-long-term-load-forecast-report-predicts-significant-increase-in-electricity-demand/>.

¹⁷ *Electric Power Monthly*, U.S. Energy Information Administration https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=table_5_06_a.

average of nearly 27%. That roughly equals an increase of \$40 for just the month of August. Utility rates over the same period rose on average by 23.2%. The average August residential kWh consumption fell during the same period by 2.83%, so while energy usage decreased, both what people were charged per unit of energy and how much they paid increased.¹⁸ Energy efficiency – particularly energy efficiency measures that also shave peak demand – helps both ratepayers’ corporate coffers and personal financial outlook, but it also helps the entire regional transmission grid by reducing the load necessary to flow through the grid.

For Pennsylvanians who are low-income, this is even more critical. National research shows that energy insecure households were billed more than other households for energy, making energy savings critically important to these families.¹⁹ According to the American Council for an Energy Efficiency Economy’s 2020 report, “How High Are Household Energy Burdens?,” the mid-atlantic region on average experiences an energy burden of 3.4%, while low-income households experience a much higher median of 9.4% energy burden. The ACEEE updated fact sheet from 2024 shows that low income renters and homeowners in the Pennsylvania cities of Pittsburgh and Philadelphia still have a much higher average energy burden (approximately 16%). These households need and deserve a robust investment in energy efficiency in the Commonwealth. As explained further throughout this testimony, ensuring that households which are systematically deferred from existing energy efficiency programs can access these resources saves

¹⁸ “Study: Despite Gains in Energy Efficiency and Green Energy Generation – Electricity Bills have Increased 27% Since 2015”, *Texas Electricity Ratings* (Aug. 2024) <https://www.texaselectricityratings.com/resources/study-despite-gains-in-energy-efficiency-electricity-bills-are-higher>.

¹⁹ “U.S. energy insecure households were billed more for energy than other households,” U.S. Energy Information Administration (May 30, 2023) <https://www.eia.gov/todayinenergy/detail.php?id=56640>.

money for all ratepayers in the long term. When the most egregiously poor performing dwellings are repaired and are improved to be higher performing homes, the ratepayer costs for other services are lessened, along with reduced demand on the grid.

IV. HEALTH AND SAFETY BARRIER MITIGATION

Q. WHY IS IT IMPORTANT TO PROVIDE SPECIFIC FUNDING FOR HEALTH AND SAFETY BARRIER MITIGATION?

A. Today, all too often, health and safety-related issues prevent participation in residential, low-income energy efficiency programs. Anecdotal evidence suggests up to 30% of prospective program participants are deferred from services due to health and safety issues which prevent the performance of blower door tests, the installation of insulation, and air sealing to make a home less drafty. These barriers include items such as knob and tube wiring, significant roof damage, various moisture issues, the presence of mold, and the presence of asbestos. Common HVAC issues like cracked heat exchangers or even a fossil fuel heating system that has not received a clean and tune for several years can lead to high carbon monoxide levels, which also prevents a customer from participating in much needed energy efficiency programming. While these HVAC situations are problematic, they can be addressed through dedicated pools of funding for emergency repairs to heating equipment or to remediate other health and safety issues, while other reasons for deferrals cannot. Choosing to invest in these much-needed improvements will help routinely deferred households, taking the worst-performing homes and transforming them into safer, more comfortable homes that have lower energy bills. Moving customers from deferral lists into programs also helps to increase program participation rates and misconceptions that energy efficiency programs are saturated.

There are many homes that have not yet received but desperately need services; energy efficiency programs just have not offered the breadth of health and safety repairs required to allow for the necessary improvements to a large percentage of households in need. Making these robust health and safety improvements is making a commitment to longer-term improvements for customers that are systematically overlooked.

Q. DID THE COMMISSION ADDRESS THE ISSUE OF HEALTH AND SAFETY BARRIER MITIGATION IN ITS IMPLEMENTATION ORDER?

A. Yes. Page 167 of the Implementation Order stated that the EE&C Plan Template will include a section to discuss the health and safety issues that arise in the delivery of the Act 129 services. In addition, the Commission states that the “remediation of health and safety issues is an ideal area for coordination” (Order, p. 167).

Q. WHAT DOES PPL PROPOSE REGARDING HEALTH AND SAFETY BARRIER MITIGATION IN THEIR PHASE V PLAN?

A. On page 79 of their Phase V Plan, PPL explains they, “will allocate up to \$1.5 million for health and safety repairs and/or upgrades needed to install comprehensive measures. This builds on the successful Phase IV Health and Safety Pilot. Measures may include, but are not limited to, electrical, plumbing, carpentry, moisture remediation, indoor air quality issues, or any other barrier determined by [PPL] to be preventing comprehensive measures.” PPL goes on further to state that this investment is “based on the results of the Phase IV pilot, the Company forecasts that this amount will be adequate to address issues that arise for income-eligible customers within Act 129, though may allot additional funding if necessary and available, based on customer need. As always, PPL Electric Utilities will provide customers with applicable and helpful referrals to other agencies, as identified or requested.” (PPL Plan section 4.4.4 at 198)

Q. WHAT DO YOU RECOMMEND THAT PPL DOES TO ADDRESS HEALTH AND SAFETY BARRIER MITIGATION?

I commend PPL for piloting a H&S program in Phase IV and using the results of that pilot to allocate a budget within their Phase V Resource Constrained Energy Efficiency Program to mitigate H&S barriers that are preventing energy efficiency projects. I also recognize that PPL acknowledges that additional funding may be allocated for H&S barrier mitigation if necessary and available, based on customer need. While recognizing PPL's leadership in proposing a dedicated H&S budget, given the size and scope of their service territory, I recommend that PPL increase their H&S budget closer to that of their peer PECO's 6.4%. More specifically, I recommend that PPL set aside up to 5.1% of their Phase V low-income program budget to be used to address health and safety barriers. This would be a five-year budget of \$2.5 million, or \$500,000 per year. Establishing this budget from the outset would avoid the need to allocate additional funds later and ensure that all customers receive the services they need. Table 1 below shows the proposed H&S budgets of both PECO and PPL both established H&S budgets along with my recommendation for a proposed adjustment to PPL's H&S budget at 5.1% of their total low-income program budget.

Table. 1 - Comparison of Health and Safety Budget Allocations

EDC	Proposed H&S Budget		Proposed LI Budget
	\$000	% of LI	\$000
PECO	\$3,000	6.4%	\$47,147
PPL (currently in Phase V Plan)	\$1,500	3.0%	\$49,352
PPL (Proposed Adjustment)	\$2,500	5.1%	\$49,352

Q. HAVE YOU ANALYZED THE IMPACT OF YOUR RECOMMENDATION ON THE COST EFFECTIVENESS OF PPL'S PORTFOLIO ?

A. Yes. First, as currently stated in Pa PUC Table 1 of their Phase V Plan projections (PPL Phase V Plan at 5), PPL's low-income program has a benefit-cost-ratio ("BCR") of 2.11 and is more cost-effective than the market rate residential program sector BCR of 1.26, which helps with maintaining cost-effectiveness at the program and portfolio level. If PPL accepts the proposed H&S budget allocation of \$2.5 million referenced above, an additional \$1 million, I project that net benefits would drop by approximately \$2.11 million using the TRC Benefit-Cost-Ratio ("BCR") for the low-income program of 2.11 (ibid). This would make net benefits for the low-income program \$54.4 million and the TRC BCR for the program would be 2.06, which is still significantly higher than the 1.26 BCR for the market rate residential program. The overall portfolio would also remain cost-effective, with the TRC BCR largely unchanged at 1.67.

Q. WHAT HEALTH AND SAFETY MEASURES SHOULD BE COVERED BY THE HEALTH AND SAFETY FUNDS?

A. Funding for health and safety barrier remediation should address the full range of problems served in the state's former Whole House Preservation program. Specifically, issues tied to moisture – like mold and rot, and the consequently needed repairs to building envelope or interior – should be eligible as a health and safety measure. Knob and Tube wiring upgrades should be permitted repairs. Similarly, significant combustion hazards like excessive wood shavings or other debris, or even hoarding situations, present a health and safety obstacle. Additionally, health problems such as pest infestations, the remediation of asbestos, and mold treatment should be covered. Additionally, lower-cost

items such as heating system clean and tunes, repairs, and cooktop/oven repairs should be allowed if needed to reduce carbon monoxide levels.

Q. HOW SHOULD PPL IDENTIFY HEALTH AND SAFETY ISSUES THAT NEED TO BE REMEDIATED?

A. With standardized training and certification now well established, PPL should incorporate an assessment that aligns with the Healthy Home Evaluator evaluations from the Building Performance Institute. They should also adopt the Healthy Home Evaluator certification as a requirement for contractors. This credential is designed to augment standard Building Performance Institute credentials like the Building Analyst, Quality Control Inspector, Energy Auditor, or MultiFamily Building Analyst. Additionally, under Phase V, collecting and reporting the data to the PA PUC would lead to a bigger picture of the value of the overall health and safety program, much like today's carbon emissions reduction calculations and reporting in the Act 129 program. While not part of energy savings calculations, carbon tracking provides valuable information on Act 129's impact.

Q. HOW WILL PPL'S PHASE V PLAN BE IMPROVED BY YOUR RECOMMENDATION TO MAKE FUNDS AVAILABLE FOR HEALTH AND SAFETY BARRIER REMEDIATION?

Again, I commend PPL's leadership for allocating specific funding to mitigate H&S barriers that are preventing energy efficiency projects in their customers' homes. My recommendation for increasing PPL's proposed budget allocation for such H&S barrier mitigation will ensure that adequate funding is available to address the needs for all customers without needing to "...allot additional funding if necessary and available, based on customer need." as PPL stated in section 4.4.4 at page 198 of their Phase V Plan. Establishing the appropriate level of funding now will ensure that the necessary barrier mitigation measures can be effectively implemented regardless of the ability to allocate other funds as needed.

V. COORDINATION OF MARKETING ACTIVITY

Q. WHAT DID THE PHASE V IMPLEMENTATION ORDER SAY REGARDING THE COORDINATION OF MARKETING ACTIVITY?

A. While the Commission did not establish the requirement of a common statewide marketing platform, they reiterated their position that EDC's should coordinate marketing efforts when likely to leverage program outcomes (Phase V Order, p. 190)

Q. WHAT COORDINATION OF MARKETING DOES PPL DESCRIBE IN THEIR PHASE V PLAN?

A. Throughout their Phase V plan, PPL refers to their efforts to market and promote their overall EE&C Portfolio and each component of the plan. However, PPL declines to coordinate with other EDCs, as on Page 197 of their plan they state explicitly, "No joint or coordinated marketing is planned for Phase V with any external, non-Company administered programs, though the Company may reference available external funding opportunities to customers, including the Penn Energy Savers website, to help educate customers."

Q. DOES PPL ADEQUATELY ADDRESS MARKETING COORDINATION IN THEIR PHASE V PLAN?

A. No. PPL needs to provide greater clarity and explicitly state how it will handle marketing coordination with other EDCs. In my role, I regularly hear from frontline community group representatives and business organizations that their members are unaware of existing Act 129 programs or how to access them. Each utility has elected to lean into creating their own branded websites and marketing material about their Act 129 programs. They vary significantly in how information is presented to consumers and how to find the detailed information on rebates and eligibility. For a business owner or head of household seeking assistance, this framework can be confusing.

I recommend that PPL, along with the other participating EDCs, align around developing and supporting a single point of entry for their Act 129 programs under a single umbrella label. For a minimum of disruption to existing branding and structure, this website could then redirect the visitor to each utility's existing websites and services. However, the joint utilities should invest in marketing this single umbrella entry point, using all available successful marketing tactics, in addition to leveraging key industry groups. Specifically - establishing or refreshing partnerships and outreach channels with the network of Chambers of Commerce, property owners and managers' associations and other likely access points to the state's business owners and commercial property owners can help to engage business owners – especially small business owners who typically do not have the benefit of professional Certified Energy Managers to guide them or property management services who may be more familiar with energy efficiency programs and opportunities. Given the absence of a statewide benchmarking requirement for commercial property owners relative to their energy efficiency performance, the need to build this common informational runway from the combined utilities is imperative. Many times, businesses may have multiple locations in multiple electric territories, so a single point of entry can help to reduce confusion.

Further, the EDCs should be required to include in their annual report the PUC a summary of their outreach activities to each sector (small business, commercial and industrial, residential, and low income) to better gauge the success or shortcoming of those efforts in each sector.

Lastly, I recommend that the EDCs conduct a survey to track awareness of Act 129 programs and to publicly share the findings and use this information as a basis for further consideration of marketing coordination.

VI. COORDINATION WITH ELECTRIFICATION PROGRAMS

Q. WHAT DID THE COMMISSION’S PHASE V IMPLEMENTATION ORDER SAY REGARDING AVAILABILITY OF HIGH EFFICIENCY HEAT PUMP AND HEAT PUMP WATER HEATER (“HPWH”) INCENTIVES?

A. The Commission ordered the EDCs to make these “measures available to HEAR and other non-Act 129 program participants along with a description of how program delivery will target these bundled, or interwoven, funding opportunities.” (Phase V Final Order, p.174).

Q. DID PPL INCLUDE THESE MEASURES IN THEIR PLANS?

A. Yes. On page 23 of their Phase V Plan, PPL confirmed that high-efficiency heat pumps and HPWHs will be available across all customer sectors. However, PPL’s plan stops short of outlining how it will coordinate with other non-Act 129 program participants, as referenced above in the PUC Order.

I recommend that the EDCs, including PPL, formally coordinate with the PA DEP on exactly how this incentive “braiding” will occur and provide notice to all intervenors in this docket with the formal coordination plan, once finalized. Further, the results of this formal coordination plan should be tracked and reported in the semi-annual and annual reports to the PUC and should include metrics such as the number of coordinated projects by measure and additional funds leveraged due to coordination.

I want to ensure that PPL will make these incentives available to customers regardless of the fuel used for space and water heating prior to the purchase of the new high-efficiency equipment.

Q. WHAT OTHER WAYS DID THE COMMISSION REQUIRE THE EDCs TO COORDINATE WITH OTHER PROGRAMS?

A. On page 187 of the Phase V Final Implementation Order, the Commission required the EDCs to “co-fund ASHRAE Level 2 audits or similar technical scoping studies with other program administrators.”

Q. DOES PPL FOLLOW THIS DIRECTIVE?

A. Yes. PPL explicitly states, “[PPL] may contribute up to \$75,000 for the completion of American Society of Heating, Refrigerating and Air-Conditioning Engineers (“ASHRAE”) level 2 audits, up to 100% of the audit costs, at up to ten properties where in-unit work is available and for which the Company can claim savings.” (PPL Plan at 197.) This is an important first step, and I recommend that PPL formally commit to cover any costs for the ASHRAE Level 2 audit not covered by the HER Program.

Q. WHY IS IT IMPORTANT TO COVER THE ENTIRE ASHRAE LEVEL 2 AUDIT COST?

A. The target market for this offering is multifamily buildings that often lack the funding to conduct a comprehensive audit, such as an ASHRAE Level 2 audit. These customers are traditionally underserved, and eliminating the cost barrier for an audit should help overcome some of the historical underinvestment in the sector. This is why PA DEP has decided to focus the HER program specifically on multifamily buildings in the Commonwealth. Additionally, low-income multifamily buildings need particular support right now, as rising prices hit these residences particularly hard. Less visibly, the rules governing subsidized housing mean that higher utility costs often reduce allowable rent, leaving landlords with fewer resources to invest in energy-saving upgrades.

VII. WORKFORCE DEVELOPMENT

Q. WHY IS WORKFORCE DEVELOPMENT IMPORTANT?

A. Workforce development is an important part of a successful utility energy efficiency program. Ensuring that the workforce is properly trained and educated on the latest technologies, implementation strategies, and customer-centric project approaches is critical to achieving positive outcomes in overall energy savings, occupant health and safety, and project cost-effectiveness, for the utility program administrator, the participating contractor, and the utility customer.

Q. DOES PPL INCLUDE WORKFORCE DEVELOPMENT IN THEIR PHASE V PLAN?

Yes. PPL includes multiple references to workforce development in their Phase V Plan. First, they discuss the development of an enhanced trade ally network component called the “PPL Heat Pump Installer Program”. This program is “...focused on heat pump adoption, proper sizing, and correct installation, as well as promoting other

comprehensive program offerings. PPL Electric Utilities may provide basic annual heat pump training, offer training incentives to promote workforce development, and highlight external workforce funding if available”. (PPL Plan at 29) PPL goes on to further explain in their plan that as part of their expanded trade ally network they will work “...to expand the available direct discount trade allies available to participants, with a focus on local, trusted community businesses. The CSP will reduce barriers to contractor participation and provide meaningful technical assistance and training. This will support the community workforce and economic development.” (PPL Plan at 79)

Q. DOES THIS ADEQUATELY ADDRESS WORKFORCE DEVELOPMENT IN THE PPL PHASE V PLAN?

A. No. While I applaud PPL’s commitment to provide meaningful heat pump technology training and providing additional incentives to trade allies who are identified as having this training and additional incentives to the customers that select trade allies identified within this category, as well as PPL’s focus on comprehensive program offerings as part of this training program, there is no mention of other meaningful technological trainings for the workforce, which should be included.

Q. WHAT WORKFORCE DEVELOPMENT TRAINING NEEDS TO BE INCLUDED IN THE PLAN FOR IT TO BE CONSIDERED ADEQUATE?

A. I recommend that PPL expand the enhanced trade ally network component to include training on heat pump water heater technology and identify contractors as specialized installers of this important technology.

Furthermore, I recommend that PPL coordinate with the other Act 129 EDCs and state programs, such as the PA DEP's HEAR and TREC to combine resources to deliver workforce development training on the focus areas referenced above. The same focus areas are important to all Act 129 EDCs and other state programs. This coordination would "improve the leverage ratio of Phase V EE&C plans", similar to that of the coordinated marketing efforts that the Commission urged EDCs to explore on page 190 of the final Act 129 Implementation Order.

Q. WHAT METRICS AND REPORTING SHOULD BE INCLUDED IN THE RECOMMENDED WORKFORCE DEVELOPMENT TRAINING PLAN?

A. To measure the success of the training plan as part of the enhanced trade ally component, the following metrics should be reported in PPL's semi-annual and annual reports.

- Training Topic
- Number of Participants
- Number of Contractor/Company Participants
- Future Scheduled Training Events

VIII. CONCLUSION

Q. Does this conclude your Testimony?

A. Yes.

VERIFICATION

I, Justin L. Carpenter, Esquire, hereby state that the facts above set forth are true and correct (or are true and correct to the best of my knowledge, information and belief) and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein made are subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Respectfully submitted,

/s/ Justin L. Carpenter

Justin L. Carpenter, Esq.

Policy Counsel

jcarpenter@keealliance.org

January 20, 2026

Jeaneen A. Zappa

Glenshaw, Pennsylvania 15116 ▪ 412-693-0319, 412-480-1223

jzappa@keealliance.org ▪ [LinkedIn](#)

Executive Leader/Government Affairs Advocate/Energy Efficiency Champion

*Track record of success in nonprofit executive leadership, setting strategic direction,
and advancing policy objectives & awareness.*

Dynamic, hands-on leader, experienced in handling fast-paced daily operations and building and leading small talented teams through coaching and mentorship. Effective collaborator with strong partnerships and industry network. Strategic thinker able to navigate complex policy issues, and deliver creative and strategic messaging to constituents. Solid executive, seasoned in working with boards of directors and closely managing the P&L/financial performance of the organization.

Career Experience

Keystone Energy Efficiency Alliance/Energy Efficiency Alliances of New Jersey & affiliated Energy Efficiency Alliance

EXECUTIVE DIRECTOR (July 2021 to present; started July 2020 as Director of Operations)

Lead 7-person nonprofit and trade associations focused on advancing energy efficiency and EE-adjacent industry in Pennsylvania and New Jersey. Establish and work through key partnerships, secure funding, manage business memberships and services, and with Board oversight, set strategic policy priorities and objectives.

- Provided “steady hand” management: Helmed the organization through an executive change and 90% staff turnover. Ramped up new team members. Identified and added needed back-office and operating systems (HR, CRM, committees).
- Boosted organization profile: Led efforts to conduct increasingly successful 2022, 2023 and 2024 Annual Policy Conferences, growing sponsorships from \$80 to \$100k and attendance from 160 to 270, featuring multiple speakers and sessions. Drove planning process and directed efforts to grow.
- Honed policy focus: Crafted inaugural process to winnow and prioritize policy goals, engaging staff, Committee and Board members. Sparked and coalesced board/committee/staff work to introduce first set of clear, documented ‘policy principles’ for the organization.
- Pushed policy actions: Engaged with coalition partners to pass expanded Commercial Property Assessed Clean Energy legislation in PA in support of energy efficiency, resilience, and indoor air quality measures plus multi-family buildings. Supported team’s work on Whole Home Repair in PA & NJ and PJM. Led efforts on several workforce development events and projects. Wrote & delivered testimony/comments.
- Served as Spokesperson: Speak at multiple public events and represent the organizations publicly and with media. Selected to serve on PA Governor Josh Shapiro’s Transition Team for Energy & Environment. Delivered various presentations on federal funding incentives, SWPA decarbonization, clean energy workforce, rising energy bills, etc. and represented the organization at press conferences and in media interviews.



continued...

Conservation Consultants Inc. – Pittsburgh, Pennsylvania**EXECUTIVE DIRECTOR** (October 2013 to June 2020)

Strategically led and transformed the operational performance of a 40-year-old non-profit business with the aid of a 25-member team. Implemented energy efficiency programs for low- and moderate-income households for utility clients, serving approximately 4500 households annually. Strengthened strategic alliances and participation in high profile public events.

- Negotiated and secured three major contracts that represented \$2.5M in new business within the first four months of tenure. Renewed each contract three years later before expiry.
- Constructed and strengthened a management team that enabled the team to become one of the first “Healthy Home Evaluator” certified teams in the entire country.
- Refreshed an 11-year-old strategic plan after evaluating current and forecasted business operations. Overhauled the company’s brand identity, mission statement, and customer commitment.
- Delivered on goal of 2850 annual home visits, despite challenges presented by client’s failed back-office system upgrade project, developing an in-house data-mining technique to generate leads.

Allegheny County Government – Pittsburgh, Pennsylvania**SUSTAINABILITY MANAGER** (2009 to 2013)

Constructed the first-ever sustainability program office for the Allegheny County government. Drafted and implemented environmentally appropriate best practices in all facilities, operations, and departments.

- Successfully submitted bids that secured \$40k in grants for the South Park Sustainable planning project, \$153k for a planned solar hot water project, and \$250k for a planned geothermal project.
- Spearheaded efforts that resulted in the county being awarded the “Top Performer” award in Sustainable Pittsburgh’s annual “Green Workplace Challenge.”
- Boosted staff engagement from 20 to 200 after implementing new tools that enabled transparent communication across a 6k member, multiple-site enterprise.

Green Building Alliance – Pittsburgh, Pennsylvania**DEPUTY DIRECTOR** (2006 to 2008); **BUSINESS DEVELOPMENT DIRECTOR** (2008 to 2009)

Directly oversaw efforts that guided daily operations, explored new business development relationships, and secured added revenue growth for the entire organization.

- Expanded the attendance of the annual conference from 150 to 400 and membership from 125 to 370 with \$54k in membership dues. Secured additional donations/sponsorships of \$150k+.
- Recruited and selected the team tasked with the build-out of a new green office space to LEED®-ND Platinum certification.
- Guided the daily operations of the company, hiring an additional five team members and directly supervising a team of eight. Strengthened skills through training and mentorship opportunities.
- Facilitated compelling presentations and publicly represented the company. Improved relationships and satisfaction throughout the customer base.

Additional Professional Experience

DIRECTOR OF MARKETING ▪ Summa Technologies – Pittsburgh, Pennsylvania

Established robust strategy for customer retention that captured customer involvement in five new case studies. Facilitated “thought leader” events that captivated customer audiences.

MANAGER OF STRATEGIC ASSETS ▪ Vocollect – Pittsburgh, Pennsylvania

Implemented a strategic marketing plan that protected intellectual property, strengthened product development, and supported a domestic sales force of 15 alongside a 20-member international distribution network.

DIRECTOR OF STRATEGIC MARKETING ▪ Descartes Systems Group – Pittsburgh, Pennsylvania

Guided a cross-functional team in the demo creation of a five-product portfolio. Executed new program initiatives in record time. Empowered the sales team with new literature, training, and other tools.

MANAGER OF MARKETING COMMUNICATIONS ▪ E-Transport – Pittsburgh, Pennsylvania

Drafted and published key messaging, marketing strategy, and support materials for sales teams. Flawlessly launched 10+ software products that captured and retained new/existing customers.

Education & Credentials

Master of Business Administration (MBA)

University of Pittsburgh, Joseph M. Katz Graduate School of Business – Pittsburgh, Pennsylvania

Bachelor of Science – Magazine Journalism and Bachelor of Science – Marketing

Syracuse University – Syracuse, New York

Professional Development

- Certificate – Principles of Building Performance Institute (BPI); Trained in Home Energy Score rating tool
- LEED® Accredited Professional – U.S. Green Building Council, Leadership in Energy & Environmental Design
- Graduate: Home Performance 101 – Dale Carnegie & Pragmatic Marketing Courses
- Graduate: CORO Center for Civic Leadership Women in Leadership Program
- Certificate: Society of Competitive Intelligence Professionals

Affiliations & Awards/Recognition

- Recognized by Cribs for Kids as the 2017 Women of Achievement Awardee (Environment Category)
- Member – Low-Income Advisory Council, PA Weatherization Assistance Program
- Member – (while at CCI) Keystone Energy Efficiency Alliance (KEEA) Annual Conference Planning Committee
- Past Member – Society of Competitive Intelligence Professionals, Supply Chain Management Professionals
- Past Board Member – PA Solar Center, NeighborWorks Western PA, Nine Mile Run Watershed Association, Allegheny Land Trust, Crafton Public Library, Hollow Oak Land Trust
- Current Board of Directors - Pittsburgh Gateways Inc.

Recent Presentations & Media Hits

Webinar Speaker: [SAM.gov](#) Registration and Training

November 20, 2025

<https://www.localgovernmentacademy.org/sam-gov-registration-training-and-live-webinar/>

ACEEE Energy Efficiency As a Resource Conference

October 8, 2025

Moderator of panel: Delivering Affordable Efficiency and Flexibility

Webinar Speaker: Act 129: Understanding the Basics

April 14, 2025

<https://energyefficiencyalliance.org/act-129-understanding-the-basics-april-14-2025/>

Webinar Speaker: Why is My Electricity Bill So High?

March 4, 2025

<https://www.youtube.com/watch?v=A0w-llk86f0>

Webinar Speaker: Understanding PRESS: The Proposed New Reliable Energy Standard for PA

April 29, 2024

<https://energyefficiencyalliance.org/understanding-press-the-proposed-new-reliable-energy-standard-for-pa/>

Workforce Development: The Clean Energy Jobs Challenge in Southwest PA

March 30, 2023 – Speaker and co-organizer in collaboration with Sustainable Pittsburgh and E2.

Saving Energy Together - CLEAResult - PA Energy Conference

March 8 – 9, 2023 – Speaker on New Federal Financial Incentives for Energy Efficiency and led session on Act 129.

Organized event:

March 15, 2023 - KEEA & EEA-NJ's webinar on "Diversify or Die" about supply chain diversification.

Southwest PA Decarbonization Forum - Pennsylvania Environmental Council

March 16, 2023 – Panelist on "Creating Jobs & Driving Economic Growth"

Media Notes:

Trib Live - June 12, 2025

<https://triblive.com/local/regional/republican-budget-bill-will-cost-thousands-of-clean-energy-jobs-millions-in-investment-advocates-say/>

Republican budget bill will cost thousands of clean energy jobs, millions in investment, advocates say

PA Environmental Digest Blogspot - July 22, 2025

<https://paenvironmentdaily.blogspot.com/2025/07/what-ai-data-center-energy-summit.html>

What The A.I. Data Center & Energy Summit Missed: Exploding Electricity Demand Already Raising Prices - Ratepayers Need Protection; No Longer An 'All Of The Above' Energy Strategy

Tribune Review - July 21, 2025

<https://community.triblive.com/news/3841186>

Gregory Bengnardi and Jeaneen A. Zappa: Local action can protect Allegheny County from rising energy costs

Washington Examiner - June 30, 2025

<https://www.washingtonexaminer.com/news/3458301/debated-energy-tax-credits-necessary-pennsylvania/> Debated energy tax credits still necessary in Pennsylvania, says industry

Evergreen Press Release - April 15, 2025

<https://www.evergreenaction.com/press/new-report-shapiro-administration-rep-steele-and-keystone-energy-efficiency-alliance-join-evergreen-to-highlight-that-fixing-pjm-can-lower-energy-costs-and-create-jobs-across-the-mid-atlantic>

NEW REPORT: Shapiro Administration, Rep. Steele, and Keystone Energy Efficiency Alliance Join Evergreen to Highlight that Fixing PJM Can Lower Energy Costs and Create Jobs Across the Mid-Atlantic

Pittsburgh Post-Gazette February 2, 2025

<https://www.post-gazette.com/business/powersource/2025/02/02/electricity-prices-grid-pennsylvania-shapiro-pjm-utilities/stories/202501310087>

Region's power grid presents a math problem for Pennsylvania

NJ Spotlight

<https://www.njspotlightnews.org/2023/05/op-ed-nj-businesses-heat-pump-benefits/>

Pittsburgh Magazine

<https://www.pittsburghmagazine.com/can-pittsburgh-save-the-planet/>

Post Gazette

<https://www.post-gazette.com/opinion/Op-Ed/2022/03/26/jeaneen-zappa-rggi-pennsylvania-climate-change-fossil-fuels/stories/202203260006>

Podcast Interviews:

PA Environmental Council

<https://pecpa.org/news/pennsylvania-legacies-181-homework/>

Whole House was successful in PA. Now it needs to be expanded and fully funded.

Penn Future

<https://www.buzzsprout.com/1944759/11524553>

Grant Street Experience

<https://open.spotify.com/episode/6C9AZWxkjLenZtGzygKUva>

Recommended

EDC	H&S Budget as a % of			
	H&S Budget	LI Budget	Res Budget	Total Budget
PECO	\$3,000	6.36%	2.20%	0.70%
PPL	\$2,500	5.07%	2.17%	0.81%
FE PA	\$2,600	4.99%	1.59%	0.67%
DLC	\$800	4.99%	2.33%	0.82%

Actual H&S Allocation

EDC	H&S Budget as a % of			
	H&S Budget	LI Budget	Res Budget	Total Budget
PECO	\$3,000	6.36%	2.20%	0.70%
PPL	\$1,500	3.04%	1.30%	0.49%
FE PA	0	0.00%	0.00%	0.00%
DLC	0	0.00%	0.00%	0.00%

PECO

Table 5: Summary of Portfolio Costs

Sector	PY18		PY19		PY
	\$0	%	\$0	%	\$0
Residential Market Rate	\$16,888	22%	\$18,461	22%	\$17,756
Residential Low-Income	\$9,358	12%	\$9,401	11%	\$9,712
Small C&I	\$18,521	24%	\$21,852	26%	\$23,545
Large C&I	\$17,537	23%	\$21,963	26%	\$25,626
Common Costs	\$13,455	18%	\$13,455	16%	\$13,455
Total Portfolio Budget ¹	\$75,759	100%	\$85,132	100%	\$90,094
SWE Cost	\$0		\$0		\$0

¹ Cells with total percentages in row 11 will be green when the totals are above 99.9% and below 100.1%. All of these

Source: Phase V Plan, pg. 11

Health and Safety Budget \$3,000,000 Source: Phase V Plan, pg. 68
Part of the Residential Low income Program

PPL

Table 8. PA PUC Table 5 - Summary of Portfolio Costs

Sector	PY18		PY19		PY
	\$0	%	\$0	%	\$0
Residential Market Rate	\$12,928	22%	\$13,290	21%	\$13,571
Residential Low-Income	\$10,952	18%	\$10,267	16%	\$10,235
Small C&I	\$17,718	30%	\$20,507	32%	\$20,176
Large C&I	\$9,796	16%	\$12,028	19%	\$13,423

Common Costs	\$8,420	14%	\$8,420	420	\$8,420
Total Portfolio Budget ²	\$59,547	100%	\$64,991	100%	\$66,511
SWE Cost	\$1,000		\$1,000		\$1,000

Source: PPL Phase V Plan, pg. 15

Health and Safety Budget \$1,500,000 Source: PPL Phase V Plan, pg. 198
Part of the Resource Constrained Residential Low income Program

FE PA

Table 5: Summary of Portfolio Costs

Sector	PY18		PY19		PY
	\$0	%	\$0	%	\$0
Residential Market Rate	\$23,305	29%	\$23,384	30%	\$23,038
Residential Low-Income	\$10,618	13%	\$10,408	13%	\$10,458
Small C&I	\$22,916	28%	\$22,306	28%	\$22,320
Large C&I	\$19,272	24%	\$18,843	24%	\$18,846
Common Costs	\$4,814	6%	\$4,047	5%	\$3,601
Total Portfolio Budget ¹	\$80,924	100%	\$78,988	100%	\$78,262
SWE Cost ²	\$800		\$800		\$800

¹ Cells with total percentages in row 11 will be green when the totals are above 99.9% and below 100.1%. All of these

Source: FE PA Phase V Plan, Appendix B, Table 5

Health and Safety Budget \$0 Source: FE PA Phase V Plan, pg. 135

DLC

Table 5: Summary of Portfolio Costs

Sector	PY18		PY19		PY
	\$0	%	\$0	%	\$0
Residential Portfolio Budget	3,393	20.90%	3,703	19.80%	3,811
Residential Low-Income Portfolio E	3,237	20.00%	3,149	16.80%	3,178
Commercial/Industrial Small Portfo	4,102	25.30%	4,594	24.60%	5,327
Commercial/Industrial Large Portfo	4,608	28.40%	6,378	34.10%	7,698
Common Costs	881	5.40%	881	4.70%	881
Total Portfolio Budget	16,222	100.00%	18,705	100.00%	20,896
SWE Cost	\$0		\$0		\$0

Source: DLC Phase V Plan, p.g 130

Health and Safety Budget \$0 Source: DLC Phase V Plan, pg. 68
Part of the Residential Low income Program

LI Budget

Total	% of Total	Res % of Total	Total Res (LI + RES) Res Budget	% of Total	Total Budget
\$47,147	34.50%	11.03%	\$136,660	31.98%	\$427,386
\$49,352	42.80%	16.05%	\$115,319	37.50%	\$307,507
\$52,154	31.91%	13.36%	\$163,459	41.88%	\$390,320
16,033	46.68%	16.41%	34,343	35.14%	97,729.76

LI Budget

Total	% of Total	Res % of Total	Total Res (LI + RES) Res Budget	% of Total	Total Budget
\$47,147	34.50%	11.03%	\$136,660	31.98%	\$427,386
\$49,352	42.80%	16.05%	\$115,319	37.50%	\$307,507
\$52,154	31.91%	13.36%	\$163,459	41.88%	\$390,320
16,033	46.68%	16.41%	34,343	35.14%	97,729.76

'20	PY21		PY22		Phase V	
%	\$0	%	\$0	%	\$0	%
20%	\$18,161	19%	\$18,247	22%	\$89,513	20.90%
11%	\$10,002	11%	\$8,675	11%	\$47,147	11.00%
26%	\$24,629	26%	\$18,775	23%	\$107,323	25.10%
28%	\$28,414	30%	\$22,588	28%	\$116,127	27.20%
15%	\$13,455	14%	\$13,455	16%	\$67,275	15.70%
100%	\$94,661	100%	\$81,740	100%	\$427,386	100%
	\$0		\$0		\$0	

cells should be green once filled out to ensure correct cell values.

'20	PY21		PY22		Phase V	
%	\$0	%	\$0	%	\$0	%
21%	\$12,963	21%	\$13,215	24%	\$65,967	21.50%
16%	\$9,580	15%	\$8,318	15%	\$49,352	16.00%
31%	\$18,092	29%	\$14,997	27%	\$91,489	29.80%
20%	\$12,856	21%	\$10,495	19%	\$58,598	19.10%

13\$	\$8,420	13%	\$8,420	14\$	\$8,420	13.70%
100%	\$61,975	100%	\$54,483	100%	\$307,507	100.00%
	\$1,000		\$1,000		\$5,000	

'20	PY21		PY22		Phase V	
%	\$0	%	\$0	%	\$0	%
29%	\$20,692	27%	\$20,885	27%	\$111,305	28.50%
13%	\$10,383	14%	\$10,287	13%	\$52,154	13.40%
29%	\$22,346	29%	\$22,366	29%	\$112,254	28.80%
24%	\$18,863	25%	\$18,871	25%	\$94,694	24.30%
5%	\$3,610	5%	\$3,843	5%	\$19,913	5.10%
100%	\$75,894	100%	\$76,251	100%	\$390,320	100%
	\$800		\$800		\$4,000	

cells should be green once filled out to ensure correct cell values. 2 Company Assumption Based on PH IV alloca

'20	PY21		PY22		Phase V	
%	\$0	%	\$0	%	\$0	%
18.20%	3,725	16.80%	3,678	18.60%	18,310	18.70%
15.20%	3,207	14.50%	3,261	16.50%	16,033	16.40%
25.50%	6,025	27.20%	4,899	24.80%	24,947	25.50%
36.80%	8,343	37.60%	7,006	35.50%	34,032	34.80%
4.20%	881	4.00%	881	4.50%	4,407	4.50%
100.00%	22,181	100.00%	19,726	100.00%	97,729.76	100.00%
	\$0		\$0		\$0	

Original

Table 1: Portfolio Summary of Lifetime Cost:

Sector	nted Lifetime	ed Lifetime B
Market Rate Residential (exclus	\$344,312	\$314,199
Residential Low-Income	\$62,503	\$78,938
Small Commercial & Industrial	\$316,367	\$449,338
Large Commercial & Industrial	\$375,196	\$534,973
Total Portfolio	\$1,098,378	\$1,377,448

Source: PECO Phase V Plan, pg. 6

Original

Table 1: Portfolio Summary of Lifetime Cost:

Sector	nted Lifetime	ed Lifetime B
Market Rate Residential (exclus	\$124,095	\$156,458
Residential Low-Income	\$51,075	\$107,547
Small Commercial & Industrial	\$431,459	\$711,778
Large Commercial & Industrial	\$239,514	\$441,497
Total Portfolio	\$846,143	\$1,417,280

Source: PPL Phase V Plan, pg. 5

Original

Table 1: Portfolio Summary of Lifetime Cost:

Sector	nted Lifetime	ed Lifetime B
Market Rate Residential (exclus	\$236,618	\$255,609
Residential Low-Income	\$69,638	\$80,373
Small Commercial & Industrial	\$366,833	\$427,391
Large Commercial & Industrial	\$381,610	\$401,116
Total Portfolio	\$1,054,699	\$1,164,489

1 "Net" refers to the arithmetic difference between the previous two column

Source: FE PA Phase V Plan, Appendix B, Table 1

Table 1: Portfolio Summary of Lifetime Cost:

Sector	nted Lifetime	ed Lifetime B
Residential	\$48,523	\$38,392
Residential Low-Income	\$9,590	\$19,288
Residential Behavioral	\$5,009	\$7,049
Low Income Behavioral	\$836	\$958
Large Commercial C	\$36,173	\$89,288
Large Industrail (I	\$11,168	\$49,146
Small C&I	\$39,951	\$105,021
Total Portfolio	\$151,251	\$309,141

Source: DLC Phase V Plan, pg. 126



\$0

Updated Analysis

\$0

Costs	Benefits	Net
\$344,312	\$314,199	-\$30,113
\$62,503	\$78,938	\$16,435
\$316,367	\$449,338	\$132,971
\$375,196	\$534,973	\$159,777
\$1,098,378	\$1,377,448	\$279,070

0 0



\$1,000

Updated Analysis

\$2,106

Costs	Benefits	Net
\$124,095	\$156,458	\$32,363
\$51,075	\$105,441	\$54,366
\$431,459	\$711,778	\$280,319
\$239,514	\$441,497	\$201,983
\$846,143	\$1,415,174	\$569,031

0

0

\$2,600

\$3,001

Updated Analysis

Costs	Benefits	Net
\$236,618	\$255,609	\$18,991
\$69,638	\$77,372	\$7,734
\$366,833	\$427,391	\$60,558
\$381,610	\$401,116	\$19,506
\$1,054,699	\$1,161,488	\$106,789

0

0

Costs	Benefits	Net
\$18,991	1.1	
\$10,735	1.2	
\$60,558	1.2	
\$19,507	1.1	
\$109,790	1.1	

1s. It does not refer to net verified savin

\$800

\$1,609

Updated Analysis

Costs	Benefits	Net
\$48,523	\$38,392	-\$10,131
\$9,590	\$17,679	\$8,089
\$5,009	\$7,049	\$2,040
\$836	\$958	\$122
\$36,173	\$89,288	\$53,115
\$11,168	\$49,146	\$37,978
\$39,951	\$105,021	\$65,070
\$151,251	\$309,141	\$157,890

0

0

Costs	Benefits	Net
-\$10,131	0.79	
\$9,698	2.01	
\$2,039	1.41	
\$122	1.15	
\$53,115	2.47	
\$37,977	4.4	
\$65,070	2.63	
\$157,890	2.04	



***Additional H&S Allocation
Reduction in Benefits***

BCR
0.913
1.263
1.420
1.426
1.254



***Additional H&S Allocation
Reduction in Benefits***

BCR
1.261
2.064
1.650
1.843
1.673

***Additional H&S Allocation
Reduction in Benefits***

BCR
1.080
1.111
1.165
1.051
1.101

***Additional H&S Allocation
Reduction in Benefits***

BCR
0.791
1.843
1.407
1.146
2.468
4.401
2.629
2.044

FE PA Testimony

EDC	Proposed H&S Budget		Proposed LI Budget
	\$000	% of LI	\$000
PECO	\$3,000	6.4%	\$47,147
PPL	\$1,500	3.0%	\$49,352
FE PA (Proposed)	\$2,600	5.0%	\$52,154

DLC Testimony

EDC	Proposed H&S Budget		Proposed LI Budget
	\$000	% of LI	\$000
PECO	0	#DIV/0!	0
PPL	0	#DIV/0!	0
FE PA (Proposed)	\$3,000	#DIV/0!	0

PPL Testimony

EDC	Proposed H&S Budget		Proposed LI Budget
	\$000	% of LI	\$000
PECO	\$18,521	#####	\$0
PPL	\$17,537	#####	\$0
FE PA (Proposed)	\$0	0.0%	\$0