

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

UGI Utilities, Inc. – Electric Division
Energy Efficiency and Conservation Plan
Phase III (June 1, 2019-May 31, 2024)

Docket No. M-2018-3004144 _____

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TABLE OF CONTENTS

1	Plan Overview	3
2	Program Descriptions	11
2.1	Residential Sector Programs	11
2.1.1	Appliance Rebate Program	11
2.1.2	School Energy Education Program	18
2.1.3	Energy Efficient Lighting	22
2.1.4	Appliance Recycling Program	26
2.1.5	Residential Low-Income Program	31
2.1.6	Community Based Organization (CBO) Marketing Program	34
2.2	Commercial and Industrial Sector Programs	36
2.2.1	Commercial and Industrial Custom Incentive Program	36
3	Cost Effectiveness of Plan and Sector Summaries	46
4	Implementation Strategy	47
5	Phase III Energy Efficiency and Conservation Rider	48
	Appendix A – Program Costs and Savings by Year	1
	Appendix B – Avoided Costs	1
	Appendix C – Key Measure Assumptions	1
1	Plan Overview	3
2	Program Descriptions	10
2.1	Residential Sector Programs	10
2.1.1	Appliance Rebate Program	10
2.1.2	School Energy Education Program	16
2.1.3	Energy Efficient Lighting	20
2.1.4	Appliance Recycling Program	24
2.1.5	Residential Low Income Program	28
2.1.6	Community Based Organization (CBO) Marketing Program	30
2.2	Commercial and Industrial Sector Programs	32
2.2.1	Commercial and Industrial Custom Incentive Program	32
3	Cost Effectiveness of Plan and Sector Summaries	38
4	Implementation Strategy	39
5	Phase III Energy Efficiency and Conservation Rider	40
	Appendix A – Program Costs and Savings by Year	1
	Appendix B – Avoided Costs	1
	Appendix C – Key Measure Assumptions	1

1 Plan Overview

UGI Utilities, Inc. – Electric Division (“UGI Electric” or the “Company”) hereby submits for approval Phase III of its Energy Efficiency and Conservation Plan (“EE&C Plan” or “Plan”) which will continue to offer many of the same effective energy efficiency measures contained within its existing Phase II EE&C Plan, along with several new measures to enhance and broaden customer participation during the term of Phase III (June 1, 2019, through May 31, 2024). The EE&C Plan includes a portfolio of energy efficiency, conservation, and consumption reduction measures, programs, and education initiatives. Unlike the major Electric Distribution Companies (“EDCs”), UGI Electric is not subject to Act 129 of 2008, P.L. 1592 (“Act 129”) because it serves fewer than 100,000 customers. 66 Pa. C.S. § 2806.1(f). However, with Phase III, UGI Electric continues to operate a voluntary EE&C Plan as suggested by the Pennsylvania Public Utility Commission (“the Commission”) in its Secretarial Letter of December 23, 2009, at Docket No. M-2009-2142851 (“Secretarial Letter”). The portfolio includes the following programs:

1. Appliance Rebate Program
2. School Energy Education Program
3. Energy Efficient Lighting Program
4. Appliance Recycling Program
5. Residential Low-Income Program
6. Community Based Organization (CBO) Marketing Program
- ~~5.7. Commercial and Industrial Custom Incentive Program~~
- ~~6. Emerging Technology and Outreach Program~~

The programs offer UGI Electric’s customers a wide range of energy efficiency and conservation measures to decrease electric consumption and, in turn, customers’ electric costs.

Phase III of UGI Electric’s EE&C Plan:

- Includes programs and individual measures designed to achieve 18,120 MWh of electric savings, meeting UGI Electric’s targeted electricity consumption reduction levels of approximately 1.66% energy savings, or 17,485 MWh, (as measured against the Company’s annual historical load for June 1, 2007, through May 31, 2008), by 2024.
- Is designed to expend no more than 2% of annual revenues for the 12-month period ended May 31, 2008; and is projected to cost approximately ~~\$6,397,22~~

million over five years, with an average annual expenditure of \$1,284 million.

- Is cost-effective based on the Total Resource Cost ("TRC") Test criterion, and provides TRC net benefits with a present value of \$3,543.7 million over the five-year life of the Plan, with a benefit-cost ratio ("BCR") of 1.4848.
- Continues to offer energy efficiency and conservation programs to all customer classes.
- Properly allocates the cost of individual measures to the customer class(es) that receive(s) the benefit of those measures.
- Uses internal UGI Electric Staff and Conservation Service Providers ("CSPs"), as necessary, to implement the programs, monitor the programs' progress, and verify the Plan results.
- Includes procedures to measure, evaluate, and verify performance of the programs and the Plan as a whole.
- Includes a Section 1307 mechanism,¹ the Phase III Energy Efficiency and Conservation Rider ("Phase III EEC Rider"), for recovery of all applicable Phase III EE&C Plan costs.²

The Phase III EE&C Plan contains a variety of programs that are key components to achieving the desired energy consumption reductions. In choosing the portfolio of programs, UGI Electric considered the currently-approved energy efficiency programs utilized by other Pennsylvania EDCs, as well as other available cost-effective energy efficiency and conservation measures, and selected those best suited to UGI Electric's size and service territory.

The current Phase III EE&C Plan is designed to phase out all residential lighting measures by January 2020, as federal lighting standards under the Energy Independence and Security Act ("EISA") of 2007 come into effect. Due to uncertainty regarding the adoption of EISA standards in 2020 in Pennsylvania, UGI Electric will closely monitor planning efforts undertaken by other EDCs in Pennsylvania and may update the Plan to continue offering residential lighting measures as consensus regarding baseline assumptions, sell-through periods, and/or any other market conditions are reached.

In Phase III, UGI Electric has modified and eliminated certain programs due to underperformance in achieving energy reductions and has added programs that are expected

¹ 66 Pa. C.S. § 1307.

² As discussed in more detail in Section 5, UGI Electric proposes to recover Phase III EE&C Plan costs through the Phase III EEC Rider.

to better address the needs of customers in UGI Electric's service territory. A summary of these changes is set forth in the table below, to be more fully explained in the appropriate program sections:

Table 1: Residential & Commercial Program Summary

Residential Program Changes			
Phase II Program	Phase III Program	Disposition	Modification
Appliance Recycling	Appliance Recycling	Continued	Updated measures.
Appliance Rebates	Appliance Rebates	Continued	Adjusted Qualified Equipment & Rebates. Merged in Fuel Switching Program.
Energy-Efficient Lighting	Energy-Efficient Lighting	Continued	Winding down by January 2020.
Fuel Switching	None	Continued	Merged into Appliance Rebate Program.
School Energy Education	School Energy Education	Continued	Expanded to High Schools.
Customer Education	None Emerging Technology and Outreach	Ended Modified	N/A Merged into Emerging Technology and Outreach.
Home Energy Audit	None	Ended	N/A
Residential Low-Income Water Heater Replacement	None	Ended	N/A
None	Residential Low-Income Program	New	
None	Community Based Organization (CBO) Marketing Program	New	

Commercial/Industrial Program Changes			
Phase II Program	Phase III Program	Disposition	Modification
HVAC Tune-up	None	Ended	N/A
Small Commercial Fuel Switching	None	Ended	Merged into Custom Program.
Custom	Custom	Continued	Adjusted delivery, incentive and administrative costs, and updated participation goals.

Crosscutting Program Changes			
Phase II Program	Phase III Program	Disposition	Modification
N/A	Emerging Technology and Outreach	New	N/A

To the extent possible, UGI Electric has attempted to incorporate reasonable ideas, insights, program features, and implementation details from best practices of the various EDCs subject to Act 129. Additionally, and as explained more fully in Section 3, below, in accordance with Paragraph 28 of the Settlement approved by the Commission at this Docket at this Docket, UGI Electric has updated its electric avoided costs to utilize those of PPL Electric Utilities Corporation ("PPL Electric").

For Phase III, UGI Electric proposes to adopt a 1.66% total energy consumption reduction target in constructing a portfolio of measures and programs targeting all customer classes on the UGI Electric system.³ For each customer segment, a set of programs was developed to provide a range of options for saving electricity, with the goal of meeting the energy reduction target while continuing successful programs from Phase II, providing new ways to engage with electric efficiency as markets shift, and maintaining a cost-effective portfolio from the TRC perspective. UGI Electric utilized the expertise of in-house staff, combined with the energy efficiency expertise of an external consultant, Green Energy Economics Group, Inc. ("GEEG"), who has worked in the energy efficiency and conservation field for many years.

The process for development of the Phase III EE&C Plan consisted of five basic elements:

1. Maintaining continuity with the existing Plan to the extent existing programs were deemed successful.
2. Assessing alternative energy efficiency and conservation resource potentials.
3. Developing and balancing the portfolio, while maintaining cost-effectiveness under the TRC Test at a sector and plan level.
4. Providing opportunities for stakeholders to participate and contribute to Plan development.
5. Refining the Plan consistent with the objectives set forth in the Commission's Secretarial Letter and Act 129, generally.

³ The 1.66% energy consumption reduction target is based on the Company's previous Phase II target, adjusted for changes to the residential lighting market and opportunities that are no longer viable due to pressure from cost-effectiveness and low participation.

Because UGI Electric is committed to a long-term investment in energy efficiency and conservation, the following guiding principles were part of the development of UGI Electric's Phase III EE&C Plan content:

1. Customer Service – The Plan was developed in a way that is easy to understand and enables customers to adopt energy efficiency measures that will save money and support the environment.
2. Proven Solutions and Sustainable Savings – The Plan focuses on proven, cost-effective energy efficiency measures as part of an extensive path to long-term and sustainable energy efficiency.
3. Flexibility – The Plan provides customers flexibility by offering a wide variety of programs in which they can participate. To support customers' actions, the Plan provides numerous measures, customer education initiatives, energy efficiency information, financial incentives, and services. For the Company, the Plan provides flexibility by allowing UGI Electric to consider the results of the programs and determine whether any adjustments are necessary to achieve the desired energy savings on a whole and/or maintain Plan cost-effectiveness, which may include re-allocating budgets within the same rate class to programs that are performing better than others. However, the Company will not, without Commission approval:
 - a. Add new programs
 - b. Eliminate existing programs
 - c. Deviate significantly from the approved program parameters
 - d. Exceed the total approved budget for the Plan

A summary of Phase III programs and anticipated savings by class is set forth below.

Table 2: Projected Energy Savings by Program⁴

Program Name	Program Market	Program Summary	Program Years Operated	Phase III MWh Savings	% of Portfolio MWh Savings
Appliance Recycling	Residential/Low-Income	Free pickup, recycling and disposal	2019-2024	3,174	17.5%
Appliance Rebates	Residential/Low-Income	Rebates for energy efficient appliances	2019-2024	3,258	18.0%
Energy Efficient Lighting	Residential/Low-Income	Up-stream incentives on Energy Star Lighting	2019-2020	1,423	7.9%
School Energy Education Program	Residential/Low-Income	Energy education and kits for students	2019-2024	1,355	7.5%

⁴The Emerging Technology and Outreach Program currently has no projected savings. If any verifiable savings do result from this program in the future, UGI Electric will provide details in future annual reports.

Residential Low-Income Program	Residential/Low-Income	TBD	2020-2024	0	0%
Community Based Organization Marketing	Residential/Low-Income	Marketing to cross-promote EE&C programs	2019-2024	0	0%
Residential Total				9,210	50.8%
C&I Custom	Commercial and Industrial/Governmental	Incentives for custom efficiency measures	2019-2024	8,910	49.2%
C&I Total				8,910	49.2%
Grand Total				18,120	100%

A summary of the total program budget is reflected below.

Table 3: Projected Budgets by Customer Class

Customer Class	Total Budget	% of Total EEC Budget
Residential*	\$2,915,205,794	45.744%
C&I*	\$1,871,100,660,200	29.336%
Portfolio-wide	\$1,600,500,000	25.118%
Total	\$6,386,894,725,994	100%

*Includes Emerging Technology and Outreach Program allocation

The chosen programs are detailed in Section 2 (Program Descriptions) of this Plan. The Plan is cost-effective under the TRC Test, as demonstrated in Section 3 of the Plan (Cost Effectiveness) and as shown in the following table.

Table 4: Cost Effectiveness Summary

Customer Class	TRC NPV Benefits	TRC NPV Cost	TRC Net Benefits	TRC Benefit/Cost Ratio
Residential*	\$5,087,589,423,542	\$2,670,842,904,424	\$2,416,747,522,094	1.9052
C&I*	\$5,634,258,693,978	\$3,310,764,788,252	\$2,323,494,905,725	1.7024
Portfolio-wide	\$0	\$1,241,206,059,674	(\$1,241,206,059,674)	N/A
Total	\$10,721,847,947,490	\$7,222,812,749,344	\$3,499,035,198,146	1.4818

As currently approved, the new Plan will go into effect June 1, 2019, and run through May 31, 2024. After two years, however, if the Company has not met 75 percent of its forecasted energy savings for those first two years of the Plan, or the Company has achieved 75 percent or more of its forecasted energy savings for those first two years and the Plan does not have a

TRC benefit-cost ratio above 1.0 for Plan Year ("PY") 8 and PY 9 total as calculated by August 30, 2021, the Company can either file a Petition to Amend this Plan or choose, in its sole discretion, to conclude this Plan after the first three years of Phase III.

**Includes Emerging Technology and Outreach Program allocation*

~~Assuming Commission approval, the new Plan will go into effect June 1, 2019, and run through May 31, 2024.~~

UGI Electric understands that customer engagement is critical to the success of the Plan and has developed several programs that provide tangible customer benefits. UGI Electric Staff and its CSPs will promote customer service throughout the Plan and coordinate with trade allies and other market participants through outreach, training, and education to raise customer awareness of UGI Electric's available programs. A more complete description of UGI Electric's implementation strategy is provided in Section 4 of this EE&C Plan.

UGI Electric will continue to employ tracking, reporting, and analyses of program data that will enable ongoing monitoring, management, analysis, and reporting. UGI Electric will focus on anticipation, prevention, and detection of problems or errors regarding Plan implementation to minimize impediments to Plan success. UGI Electric will continue working closely with its CSPs to ensure that qualified individuals are performing the required actions to carry out the Plan. In addition, UGI Electric will continue to submit an annual report to stakeholders three months after the end of each program year. Finally, UGI Electric has developed Phase III with the idea that updates or revisions to the Plan can be achieved on an ongoing basis to address customer participation levels and to achieve Plan success.

Moreover, under Paragraph 23(c) of the Settlement approved by the Commission at this Docket, UGI Electric has set aside \$250,000 for evaluation, measurement, and verification ("EM&V"). To the extent that the Phase III EE&C Plan is to continue for the full five-year term, the Plan shall be subject to a formal EM&V process after the third year of the Plan. To the extent that the Phase III EE&C Plan is to end after PY 10, then the Plan shall not be subject to a formal EM&V process after the third year of the Plan, and the Company shall not incur any costs related to such EM&V process.

Cognizant of the guidelines in the Commission's Secretarial Letter and the related requirements of Act 129, UGI Electric will continue to use 2% of 2008 revenue⁵, or \$2.5 million, as an absolute cap on annual spending.⁶ Spending for Phase III is projected to be under the 2%, with an average expected spending of approximately \$1.284 million per year. As in its Phase I and II Implementation Orders, the Commission found that EDCs should be permitted to recover the incremental costs incurred to design, create, and obtain Commission

⁵ UGI Electric utilized annual revenues for the twelve-month period ended May 31, 2008.

⁶ While UGI Electric did not reach the 2% budget cap in Phase I or Phase II of its EE&C Plan, UGI Electric seeks to keep this current cap in place for Phase III, as it allows for Plan flexibility to accommodate increased customer demand.

approval of a plan in Phase III.⁷ Thus, the total Plan cost of ~~\$6,397.22~~ million also includes the costs that UGI Electric incurred or will incur to design, create, and obtain approval of the Phase III EE&C Plan.

Consistent with Act 129, UGI Electric has designed its Phase III EE&C Plan to provide that EE&C measures are paid for by the same customer class that receives the energy efficiency and conservation benefits of those measures by assigning the costs related to each measure to those classes that will receive the benefits. See 66 Pa. C.S. § 2806.1(a)(11). The cost recovery mechanism, the Phase III EEC Rider, is described in more detail in Section 5 of the Plan. UGI Electric has designed the Phase III EEC Rider to apply to all default service and choice customers.

Plan costs are likely to vary year-to-year, and UGI Electric proposes to recover those costs on an annual basis by way of a Section 1307 recovery mechanism designed to track actual yearly expenditures by customer class. Distribution of cost recovery is anticipated to be relatively even over the course of the Plan.

UGI Electric proposes to continue to reconcile the revenues collected under its cost recovery mechanism on an annual basis. In addition, UGI Electric proposes to conduct a final reconciliation of total revenue collected to total Plan expenditures (up to the budget caps) at the end of this five-year Plan. Any resulting over/under collections existing as of the last year of the Phase III EE&C Plan will be recovered/refunded over the one-year period following the end of the Plan ("Final Reconciliation Year"). If it is known that there will be a Phase IV EE&C Plan at the end of the Final Reconciliation Year related to Phase III, any remaining balance will be recovered/refunded through the Phase IV EEC Rider's E-Factor. If there will be no Phase IV EE&C Plan, any balance remaining for a customer class at the end of the Final Reconciliation Year will be trued up through a one-time bill credit issued to the applicable customers during the second full billing month following the end of the Final Reconciliation Year, and to recover any resulting over/under collections during the following year in the absence of any additional Plan extensions. The annual reconciliation and end-of-Plan reconciliation will be subject to Commission review and potential audit, as the Commission deems necessary.

⁷ *Energy Efficiency and Conservation Program*, Docket No. M-2014-2424864, at pp. 132, 135-36 (Order Entered June 19, 2015) ("*Phase III Implementation Order*").

2 Program Descriptions

2.1 Residential Sector Programs⁸

2.1.1 Appliance Rebate Program

Objectives

The objectives of the Appliance Rebate Program include:

1. Provide customers with opportunities to reduce their energy costs and increase their energy efficiency.
2. Encourage customers to install high-efficiency HVAC and electric appliances and to switch to natural gas from electricity.
3. Encourage the use of high-efficiency/ENERGY STAR-rated equipment.
4. Promote strategies that encourage and support market transformation for high-efficiency appliances and equipment.
5. Achieve approximately 5,579 installed measures through 2024, with a total reduction of approximately 3,258 MWh.

Target Market

UGI Electric's Appliance Rebate Program will be available to all residential customers, including low-income customers and new residential construction using a consistent implementation strategy, incentive mechanism, and administrative process.

The table below outlines eligibility parameters for the residential sector.

Customer Eligibility Parameters	
Customer type	Residential/Low-Income
Building Type	All
Building Vintage	All
Building ownership	Owner or tenant with owner approval

Program Description

The program promotes the purchase and installation of a wide range of high-efficiency equipment. The Appliance Rebate Program provides customers with financial incentives to

⁸ It should be noted that all Residential Sector programs also apply to governmental entities and the following non-profit entities: firehouses, ambulance providers, and senior centers.

offset the higher purchase costs of energy-efficient equipment. Targeted equipment includes heating, cooling, water heating, and other appliances. Equipment must meet ENERGY STAR requirements if such standards exist.

Implementation Strategy

To provide a seamless continuation of the program, along with a positive customer experience, UGI Electric will continue to utilize a CSP for customer intake and rebate processing.

Customers will be required to submit a program application with documentation of the equipment purchase and installation(s) for verification and rebate processing.

Key steps in program participation

1. Customers may be directed to the program through UGI Electric's marketing activities, the Company's website, equipment dealers or equipment installation contractors.
2. Customers will generally work with the equipment/appliance retailer or installation contractor to fill out program applications and ensure the required documentation is submitted to the program CSP for processing.
3. The CSP will review documentation to verify that the applicant is a UGI Electric customer and that the installed equipment meets the minimum efficiency standard.
4. Customers installing eligible high-efficiency equipment will schedule the work directly with their equipment dealer or installation contractor.
5. The CSP will process rebates in the form of checks or check cards for qualified equipment.

Marketing Strategy

This program relies on both customer education and point-of-sale dealer and installer information for promotion. UGI Electric will work with retailers to promote the program. This strategy may include, but will not be limited to:

1. Promoting the program in UGI Electric's customer bill inserts.
2. Communicating and providing access to program information on the Company's website.
3. Educating customers through various media campaigns which may include radio and/or social media advertising.
4. Coordinating outreach to trade allies, including, but not limited to, HVAC and appliance dealers.

Eligible Measures and Incentive Strategy

The following table provides a list of measures, minimum eligibility requirements, and incentive levels.

Table 5: Eligible Measures⁹

Measure	Eligibility Requirement	Initial Incentive	Incentive Maximum
Central Air Conditioner	SEER 15 and above	N/A	\$350
	SEER 16 and above	\$150	
Room AC Unit	ENERGY STAR	\$20	\$50
Wi-Fi-enabled Thermostat	ENERGY STAR, electric heating	\$50	\$250
	ENERGY STAR, gas-heating, central A/C	\$25	
Ductless Mini Split Heat Pump	SEER 16 and above	\$150 per ton	\$350 per ton
	SEER 19 and above	\$200 per ton	
	SEER 21 and above	\$250 per ton	
Clothes Washer	ENERGY STAR	\$25	\$75
	ENERGY STAR Most Efficient (CEE Tier 1)	\$25	
	CEE Tier 2	\$25	
Dishwasher	ENERGY STAR	\$20	\$30
Refrigerator	ENERGY STAR	\$25	\$100
	CEE Tier 2	\$25	
	CEE Tier 3	\$25	
Dehumidifier	ENERGY STAR	\$25	\$50
Pool Pump (in-ground)	Variable Speed	\$350	\$500

⁹ Measures with N/A for current incentive are not included in program projections at this time but may be offered to customers in the future if market conditions and/or cost-effectiveness analysis allow.

Measure	Eligibility Requirement	Initial Incentive	Incentive Maximum
Natural gas high efficiency central heat (from electric heating)	ENERGY STAR	\$1,500	\$1,500
Natural gas water heater (from electric water heating)	ENERGY STAR	N/A	\$250
Natural gas clothes dryer (from electric clothes dryer)	ENERGY STAR	N/A	\$250
Heat Pump Water Heater	2.3 EF and above	N/A	\$500
Air-Source Heat Pump	SEER 15 and above	N/A	\$800
Manufactured Home	ENERGY STAR	N/A	\$1,500
Custom Measures / New Technologies	Must have a TRC benefit-cost ratio of at least 1.0	N/A	Minimum of \$0.14 per annual kWh Saved or 50% of total project cost.

UGI Electric will periodically review its programs and may adjust measures, rebate levels, performance criteria, and/or eligibility ratings in the future as market conditions change. UGI Electric will review results from this program and determine whether any adjustments are needed to achieve the desired energy savings on a whole and/or maintain Plan cost effectiveness.

UGI Electric will require that rebate applications be submitted within 180 days of the measure's installation date.

Evaluation, Measurement, and Verification ("EM&V")

UGI Electric will strive to continuously improve the success of its Plan to achieve program goals. UGI Electric and the CSP will enhance quality control, evaluate, measure and verify procedures to track program activities, monitor performance and progress toward targets, and take corrective action when warranted.

Quality control ("QC") will be integral to the delivery of all programs in UGI Electric's Phase III EE&C Plan. QC measures will be deployed at various stages of program implementation to ensure the highest industry standards of operational efficiency. These measures will include, but will not be limited to, the following:

- Ongoing tracking of program activities and costs through dedicated UGI Electric Staff and various CSPs.
- Applying rigorous screening and qualifying protocols in engaging CSPs.

QC processes will strive to:

- Prevent errors from beginning to end in any given program process.
- Detect and correct errors as early as possible.
- Eliminate the causes of errors as well as the errors themselves.
- Establish a correction plan based on best practices and lessons learned.

The program CSP, or UGI Electric Staff if no CSP involvement is indicated, will track the data necessary to verify program activities and outcomes. For the Appliance Rebate Program, this data will include:

- Participant information: account number, rate class, and contact information.
- Measure information: make and model number of new appliances/appliance, type and quantity of measures installed, and efficiency rating.
- A copy of a dated and paid invoice.
- New construction information: developer contact information, builder contact information, and confirmation of new account activation (most recent bill).

The CSP shall provide weekly and/or monthly reports to UGI Electric for measurement and verification.

Estimated Participation

Participation levels were developed based on current program participation rates and demand for new and/or modified offerings.

Table 6: Projected Participation

Measure	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Central Air Conditioner	35	37	37	37	37	183
Room AC Unit	180	178	178	178	178	892
Wi-Fi-enabled Thermostat	100	100	100	100	100	500
Ductless Mini Split Heat Pump	86	85	85	85	85	426
Clothes Washer	180	178	178	178	178	892
Dishwasher	180	182	182	182	182	908
Refrigerator	250	247	247	247	247	1,238
Dehumidifier	80	82	82	82	82	408
Pool Pump (in-ground)	8	8	8	-	-	24
Gas high efficiency central heat (from electric heating)	20	20	20	20	20	100
Total	1,119	1,119	1,119	1,111	1,111	5,579

Program Budget, Costs and Cost-Effectiveness

Over the five-year Phase III EE&C Plan, the program is expected to achieve electricity consumption savings of approximately 3,258 MWh. The annual budget allocation, cumulative MWh savings through 2024 and overall program cost-effectiveness for the residential customer sector are shown in the table below.

Table 7: Program Savings and Costs

Benefit/Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Savings (MWh)	656	656	656	645	645	3,258
Capacity Savings (MW)	0.047	0.047	0.047	0.044	0.044	0.230
Total Resource Cost	\$358,325	\$361,951	\$365,644	\$364,140	\$367,884	\$1,817,943
Direct Participant Cost	\$108,175	\$111,801	\$115,494	\$117,290	\$121,034	\$573,793
Direct Utility Costs	\$250,150	\$250,150	\$250,150	\$246,850	\$246,850	\$1,244,150
Customer Incentives	\$87,550	\$87,550	\$87,550	\$84,750	\$84,750	\$432,150
Administration	\$138,600	\$138,600	\$138,600	\$138,100	\$138,100	\$692,000
Marketing	\$24,000	\$24,000	\$24,000	\$24,000	\$24,000	\$120,000

Table 8: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	\$1,406,973
NPV Costs	\$1,426
Net Benefits	\$(20,452)
TRC Benefit/Cost Ratio	0.9968

|

2.1.2 School Energy Education Program

Objectives

The objectives of the Residential School Energy Education Program include:

1. Educate students on various energy types, generation and consumption, home energy use, and ways to increase energy efficiency in a home.
2. Provide customers with opportunities to reduce their energy costs and increase their energy efficiency.
3. Encourage customers to improve the efficiency of their homes by providing an energy efficiency toolkit.
4. Obtain participation of approximately 7,250 students, teachers and families through PY 12, with a total reduction of approximately 1,355 MWh.

Target Market

This program targets residential customers with students in 4th through 12th grade. Participants must have electric service. The table below outlines eligibility parameters.

Customer Eligibility Parameters

Customer type	Residential/Low-Income
Building Type	All
Building Vintage	All
Building ownership	Owner or tenant with owner approval

Program Description

The Residential School Energy Education Program is designed to educate 4th through 12th grade students on various energy types, energy consumption and generation, home energy use, and ways to save energy in a home.

The program is typically delivered through school presentations. Teachers and schools are recruited throughout UGI Electric's service territory. In consultation with the state department of education, presentations are scheduled to avoid testing schedules, vacation periods, and other school activities.

Students and teachers at one grade level in 4th through 7th grade, and one grade level in 9th through 12th grade, attend a one-hour presentation on energy literacy and energy efficiency. Under the direction of the CSP's instructors, students learn about energy. A PowerPoint presentation guides the discussion, and hands-on learning activities are employed to build understanding among students.

The culmination of the school presentation is the distribution of free, take-home energy efficiency kits. After the completion of the school presentation, teachers ensure that each

student who has returned a signed parent permission/participation slip receives a kit. As part of a homework assignment, students then install devices with a parent and record the installation and other home energy usage and behavior information on a form. Teachers are incentivized by a performance-based mini-grant to collect Household Report Cards and return the forms to the CSP by a predetermined deadline. The CSP analyzes and summarizes installation and usage information and reports back to UGI Electric.

Annual Implementation Outline

The implementation strategy for the program includes the following key components:

- Developing content aligned with grade-appropriate academic standards as defined by the state department of education.
- Determining school eligibility and targeting schools for participation.
- Recruiting teachers and conducting additional education activities.
- Registering teachers online and scheduling presentations.
- Preparing curriculum and presentation materials.
- Developing energy efficiency kits.
- Assembling and shipping energy efficiency kits.
- Conducting school presentations.
- Awarding incentives.
- Gathering and analyzing program data using the Household Report Card.
- Reporting estimated energy savings.
- Program evaluation and final reporting.

Implementation Strategy

The existing CSP will continue to oversee the School Energy Education program. UGI Electric and CSP staff will manage the program and will handle acquiring the materials, mailing, recordkeeping, and reporting.

Marketing Strategy

This program relies on both getting schools involved and generating awareness at the local level. UGI Electric already offers this program for middle schools and will now be rolling out additional services to include high school students.

1. Leverage UGI Electric's CSP to establish relationships and manage program enrollment with various schools in the service territory.
2. Communicate and provide access to program information on the Company's website.

Eligible Measures and Incentive Strategy

Participants in the program will receive a free take-home energy efficiency toolkit, with a variety of low-cost measures. LED light bulbs will be included in kits until January 2020.

UGI Electric will review the program and may adjust available measures or eligibility qualifications as warranted by changing market conditions or to manage program delivery, participation, and budgets.

Evaluation, Measurement and Verification

UGI Electric will strive to continuously improve the success of its Plan to achieve program goals. UGI Electric and the CSP will enhance quality control, evaluate, measure and verify procedures to track program activities, monitor performance and progress toward targets, and take corrective action when warranted.

QC is integral to the delivery of all programs in UGI Electric’s EE&C Plan. QC measures will be deployed at various stages of program design and implementation to ensure the highest industry standards of operational efficiency.

The CSP will track all the data necessary to verify program activities and outcomes. For the School Energy Education Program, this data will include:

- Participant information: contact information.
- School information: site (facility) location and teacher involved.
- Expenditures and energy savings.

QC processes will strive to:

- Prevent errors from beginning to end in any given program process.
- Detect and correct errors as early as possible.
- Eliminate the causes of errors as well as the errors themselves.
- Establish a correction plan based on best practices and lessons learned.

The CSP shall provide periodic reports to UGI Electric for measurement and verification.

Estimated Participation

Participation levels were developed based on achieved participation levels to date, along with anticipated school interest.

Table 9: Projected Participation

Measure	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Middle School Kits	1,000	1,000	1,000	1,000	1,000	5,000
High School Kits	450	450	450	450	450	2,250
Total	1,450	1,450	1,450	1,450	1,450	7,250

Program Budget, Costs and Cost-Effectiveness

Over the five-year Plan, the program is expected to achieve electricity consumption savings of approximately 1,355 MWh. The annual budget allocation, MWh savings, and overall program cost-effectiveness for the residential customer sector are shown in the table below.

Table 10: Program Savings and Costs

Benefit/Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Savings (MWh)	372	246	246	246	246	1,355
Capacity Savings (MW)	0.046	0.031	0.031	0.031	0.031	0.168
Total Resource Cost	\$139,031	\$124,850	\$124,850	\$124,850	\$124,850	\$638,431
Direct Participant Cost	\$-	\$-	\$-	\$-	\$-	\$-
Direct Utility Costs	\$139,031	\$124,850	\$124,850	\$124,850	\$124,850	\$638,431
Customer Incentives	\$109,031	\$94,850	\$94,850	\$94,850	\$94,850	\$488,431
Administration	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$125,000
Marketing	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000

Table 11: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	\$2,430,372
NPV Costs	\$491
Net Benefits	\$1,939,881
TRC Benefit/Cost Ratio	4.9583

2.1.3 Energy Efficient Lighting

Objectives

The objectives of the Energy Efficient Lighting Program include:

1. Provide a mechanism for customers to easily obtain discounted ENERGY STAR-qualified LED Light Bulbs.
2. Increase consumer awareness and understanding of energy efficient LED products.
3. Aid in the market transition to new efficiency standards under the EISA in 2020.
4. Distribute approximately 38,000 LEDs through 2020, with a total reduction of approximately 1,423 MWh.

Target Market

This program will be available to all UGI Electric residential customers.

Customer Eligibility Parameters

Customer type	Residential/Low-income
Building Type	All
Building Vintage	All
Building ownership	Owner or tenant with owner approval

Program Description

This program encourages customers to purchase new ENERGY STAR-rated LED bulbs.

The program has two components:

1. A retail upstream lighting incentive that will significantly reduce the customer cost of ENERGY STAR LED bulbs.
2. Free LED distribution at various community events and to UGI Electric's Customer Assistance Program ("CAP") participants.

Implementation Strategy

UGI Electric intends to use the Company's existing CSP for the first seven months of Program Year 8 and will then wind down the program as EISA standards take effect January 2020. The CSP will manage an upstream Energy Efficient Lighting Campaign, including negotiating bulk pricing, recruitment, coordination with retail stores, education and outreach to retailers, community events, and tracking and providing program reports. The CSP will target a broad range of retailers, including big box and chain stores as well as smaller local and independent stores throughout UGI Electric's service territory. Also, the CSP will deliver free LEDs to low income residential customers in UGI Electric's CAP program. UGI Electric staff will provide overall strategic direction to the CSP for this program:

1. Customers may purchase discounted LEDs at a participating retailer, where LED discounts are applied at the register; customers may become aware of the program through the CSP, UGI Electric, or retailer education and promotional activities.
2. Retailer provides documentation of LED sales results to the CSP.
3. The CSP tracks results and reports periodically to UGI Electric.
4. The CSP will provide free LEDs to low income residential customers in UGI Electric's CAP program.

Marketing Strategy

The marketing strategy may include, but will not be limited to:

1. Promoting the program in UGI Electric's customer bill insert.
2. Communicating and providing access to program information on the Company's website.
3. Educating customers through various media campaigns, which may include radio and/or social media advertising.
4. Partnering with retailers for in-store displays.

Eligible Measures and Incentive Strategy

The CSP will negotiate bulk pricing and manage the delivery of upstream incentives to participating LED manufacturers, which are expected to cover approximately 50-75% of the retail cost of LEDs and 100% of the cost of distribution of bulbs to CAP customers.

UGI Electric will review the program and may adjust available measures or eligibility qualifications as warranted by changing market conditions or to manage program delivery, participation, and budgets.

Evaluation, Measurement, and Verification

UGI Electric will strive to continuously improve the success of its Plan to achieve program goals. UGI Electric and the CSP will enhance quality control, evaluate, measure and verify procedures to track program activities, monitor performance and progress toward targets, and take corrective action when warranted.

QC will be integral to the delivery of all programs in UGI Electric's Phase III EE&C Plan. QC measures will be deployed at various stages of program design and implementation to ensure the highest industry standards of operational efficiency. These measures will include, but will not be limited to, the following:

- Ongoing tracking of program activities and costs through dedicated UGI Electric Staff and the program CSP.
- Applying rigorous screening and qualifying protocols in engaging new CSPs should that be necessary.

QC processes will strive to:

- Prevent errors from beginning to end in any given program process.
- Detect and correct errors as early as possible.
- Eliminate the causes of errors as well as the errors themselves.
- Establish a correction plan based on best practices and lessons learned.

The program CSP will track the data necessary to verify program activities and outcomes. For the Residential Energy Efficient Lighting program, this data will include:

- Expenditures and energy savings.
- Retailer information: retail location, contact information, type, and quantity of products sold.
- Customer information for the LED bulb distribution to CAP customers.

CSP shall provide weekly and/or monthly reports to UGI Electric for measurement and verification.

Estimated Participation

Program participation rates were developed based on past participation numbers and the anticipated number of LEDs purchased by residential customers and given away at community events and to residential CAP customers for free.

Table 12: Program Participation

Measure	PY 8	PY 9	PY 10	PY 11	PY 12	Total
LED Purchase	35,000	--	-	-	-	35,000
LED give-away (Includes an allocation for CAP)	3,000	-	-	-	-	-3,000
Total	38,000	-	-	-	-	38,000

Program Budget, Costs, and Cost-effectiveness

Over the five-year plan, the program is expected to achieve electricity consumption savings of approximately 1.423 MWh due to the program only being available in Program Year 8. The annual budget allocation, savings, and overall program cost-effectiveness for the program are shown in the table below.

Table 13: Program Savings and Costs

Benefit/Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Savings (MWh)	1,423	-	-	-	-	1,423
Capacity Savings (MW)	0.178	-	-	-	-	0.178
Total Resource Cost	\$175,525	\$-	\$-	\$-	\$-	\$175,525
Direct Participant Cost	\$34,312	\$-	\$-	\$-	\$-	\$34,312
Direct Utility Costs	\$141,213	\$-	\$-	\$-	\$-	\$141,213
Customer Incentives	\$66,213	\$-	\$-	\$-	\$-	\$66,213
Administration	\$70,000	\$-	\$-	\$-	\$-	\$70,000
Marketing	\$5,000	\$-	\$-	\$-	\$-	\$5,000

Table 14: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	\$161442
NPV Costs	\$57
Net Benefits	\$10485
TRC Benefit/Cost Ratio	2.8348

Other Information

Due to uncertainty regarding the adoption of EISA standards in 2020 in Pennsylvania, UGI Electric will closely monitor planning efforts undertaken by other EDCs in Pennsylvania and may update this program to reflect changes to baseline assumptions, sell-through periods, and/or any other market conditions that may affect the continued viability of this program. If the EISA standard does not fully go in to effect in 2020, UGI Electric may choose to continue offering the Energy Efficient Lighting program.

2.1.4 Appliance Recycling Program

Objectives

The objectives of the Appliance Recycling Program include:

1. Encourage customers to dispose of their existing, inefficient appliances when they purchase new or eliminate a second unit that may not be needed.
2. Reduce the use of secondary, inefficient appliances.
3. Ensure appliances are disposed of in an environmentally responsible manner.
4. Decommissioning to ensure appliances are not resold in a secondary market.
5. Recycle approximately 2,725 refrigerators and freezers, 275 window air conditioning units, and 125 dehumidifiers through PY 12, with a total reduction of approximately 3,174 MWh.

Target Market

The program targets residential customers with a working, residential-sized refrigerator or freezer. Refrigerators must be at least 10 cubic feet in size. Window air conditioners and dehumidifiers will only be picked up in conjunction with a refrigerator or freezer pick-up.

Customer Eligibility Parameters

Customer type	Residential/Low-Income
Building Type	All
Building Vintage	All
Building ownership	Owner or tenant

Program Description

A customer incentive will be offered for customers who turn in eligible appliances. The program provides free pick-up and disposal of old, inefficient refrigerators, freezers, dehumidifiers and window air conditioning units. Units must be plugged in and functioning when picked up.

All units are disposed of in an environmentally responsible manner. This involves removing hazardous materials such as chlorinated fluorocarbons from the refrigerant and foam insulation, preparing refrigerant for reclamation, and recycling other materials such as metal and plastic.

Implementation Strategy

UGI Electric will continue to utilize a turn-key Appliance Recycling CSP to deliver this program. The CSP will be responsible for the following:

1. Call center services, including customer intake and scheduling.
2. Processing applications and rebates.
3. Tracking program data.
4. Providing customer and transaction information to UGI Electric.

UGI Electric EE&C Staff will provide overall strategic direction and program management for the program. Key steps in program participation may include the following:

1. CSP schedules and executes appliance collection.
2. CSP verifies customer and appliance eligibility.
3. CSP picks up and transports appliances to recycling facility.
4. CSP recycles applicable components and appropriately disposes of remaining components.
5. CSP tracks customer data and provides UGI Electric program data.
6. CSP processes rebate payments for customers.

Marketing Strategy

Marketing for this program will be conducted by UGI Electric with support from the CSP. The strategy may include, but not be limited to:

1. Promoting the program in UGI Electric customer bill inserts.
2. Communicating and providing access to program information on the Company's website.
3. Educating customers through various media campaigns which may include radio and/or social media advertising.
4. Including program information on ENERGY STAR "Find a Fridge or Freezer Recycling Program" web page.

Eligible Measures and Incentive Strategy

There are two distinct incentives associated with the program:

1. Free pick-up and disposal of refrigerator, freezer, window A/C unit, dehumidifier.
2. Appliance rebate.

There is a limit of two rebates per customer address per program year. Appliance eligibility parameters and rebates are shown in the table below.

Table 15: Eligible Measures*

Measure	Eligibility Rating	Initial Incentive	Maximum Incentive
Refrigerator	Working unit; ≥ 10 CU FT.	\$50	\$75
Freezer	Working Unit	\$50	\$75
Window Air Conditioner	Working Unit	\$20	\$50
Dehumidifier	Working Unit	\$20	\$50

*UGI Electric may offer other forms of incentives of equivalent value, such as low-flow devices, advanced power strips, or other measures at no cost to the participant.

UGI Electric will review the program and may adjust available measures or eligibility qualifications as warranted by changing market conditions or to manage program delivery, participation, and budgets.

Evaluation, Measurement, and Verification

UGI Electric will strive to continuously improve the success of its Plan to achieve program goals. UGI Electric and the CSP will enhance quality control, evaluate, measure and verify procedures to track program activities, monitor performance and progress toward targets, and take corrective action when warranted.

QC will be integral to the delivery of all programs in UGI Electric's Phase III EE&C Plan. QC measures will be deployed at various stages of program design and implementation to ensure the highest industry standards of operational efficiency. These measures will include, but will not be limited to, the following:

- Ongoing tracking of program activities and costs through dedicated UGI Electric Staff and CSP
- Applying rigorous screening and qualifying protocols in engaging a new CSP, should that be deemed necessary

QC processes will strive to:

- Prevent errors from beginning to end in any given program process
- Detect and correct errors as early as possible
- Eliminate the causes of errors as well as the errors themselves
- Establish a correction plan based on best practices and lessons learned

The program CSP and UGI Electric Staff will track all the data necessary to verify program activities and outcomes. For the Residential Appliance Recycling Program, this data will include:

- Participant information: account number, rate class, and contact information.
- Measure information: make and model number of old applianceappliance, type, size, and quantity.
- Expenditures and energy savings.

The CSP will provide weekly and/or monthly reports to UGI Electric for measurement and verification.

Estimated Participation

Program participation levels were developed based on: (1) actual experience with this program during Phase II; and (2) consultation with the CSP on participation rates within similarly operated programs. The appliance recycling projections are shown below.

Table 16: Projected Participation

Measure	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Fridge	435	435	435	435	435	2,175
Freezer	110	110	110	110	110	550
Room AC	55	55	55	55	55	275
Dehumidifier	25	25	25	25	25	125
Total	625	625	625	625	625	3,125

Program Budget, Costs, and Cost-effectiveness

Over the five-year Phase III EE&C Plan, the program is expected to achieve electricity consumption savings of approximately 3,174 MWh. The annual budget allocation, MWh savings, and overall program cost-effectiveness are shown in the table below.

Table 17: Program Savings and Costs

Benefit/Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Savings (MWh)	635	635	635	635	635	3,174
Capacity Savings (MW)	0.087	0.087	0.087	0.087	0.087	0.436
Total Resource Cost	\$140,400	\$140,400	\$140,400	\$140,400	\$140,400	\$702,000
Direct Participant Cost	\$-	\$-	\$-	\$-	\$-	\$-
Direct Utility Costs	\$140,400	\$140,400	\$140,400	\$140,400	\$140,400	\$702,000
Customer Incentives	\$28,850	\$28,850	\$28,850	\$28,850	\$28,850	\$144,250
Administration	\$61,550	\$61,550	\$61,550	\$61,550	\$61,550	\$307,750
Marketing	\$50,000	\$50,000	舉舊盟	\$50,000	\$50,000	\$250,000

Table 18: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	\$1,090,936
NPV Costs	\$551
Net Benefits	\$539,385
TRC Benefit/Cost Ratio	1.9870

2.1.5 Residential Low-Income Program

Objectives

The objectives of the Residential Low-Income Program include:

1. Provide low-income customers with an array of no-cost energy-saving equipment and/or education to help reduce their energy costs.
2. Provide the opportunity for the Company to offer additional and/or different measures than those offered through the Company's Low-Income Usage Reduction Program ("LIURP").

Target Market

This program targets UGI Electric residential low-income customers.

Customer Eligibility Parameters

<u>Customer type</u>	<u>Low-income</u>
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<u>Building Type</u>	<u>All</u>
<u>Building Vintage</u>	<u>All</u>
<u>Building ownership</u>	<u>Owner or tenant with owner approval</u>

Program Description

UGI Electric will launch a residential low-income program by June 1, 2020. At least 30 days prior to launching the residential low-income program, UGI Electric will provide a written notification to the Commission's Bureau of Technical Utility Services and the parties in the Phase III EE&C Plan proceeding. The notification will include a description of the proposed program, projections for customer participation, expenses, cost-effectiveness, and details on how the program will be evaluated and verified upon completion.

Implementation Strategy

If UGI Electric determines that this program cannot be managed internally, UGI Electric will utilize a CSP that will support and deliver this program.

Marketing Strategy

UGI Electric may work with the Low-Income CSP to develop and execute a marketing plan that captures and employs targeted outreach and participation.

Eligible Measures and Incentive Strategy

UGI Electric has not yet determined specific measures but anticipates offering measures at no cost to the customer.

Evaluation, Measurement, and Verification

UGI Electric will strive to continuously improve the success of its Plan to achieve program goals. UGI Electric and the CSP will enhance quality control, evaluate, measure and verify procedures to track program activities, monitor performance and progress toward targets, and take corrective action when warranted. The Company's annual reports will detail the implementation of the program, findings from the program, and the Company's evaluation and verification of the program's results.

Estimated Participation

Table 19: Program Savings and Costs¹⁰

<u>Benefit/Cost Component</u>	<u>PY 8</u>	<u>PY 9</u>	<u>PY 10</u>	<u>PY 11</u>	<u>PY 12</u>	<u>Total</u>
<u>Savings (MWh)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>Capacity Savings (MW)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

¹⁰ Savings projections, direct participant costs, and customer incentives are not available at this stage of program development.

Total Resource Cost	\$-	\$35,000	\$35,000	\$35,000	\$35,000	\$140,000
Direct Participant Cost	\$-	\$-	\$-	\$-	\$-	\$-
Direct Utility Costs	\$-	\$35,000	\$35,000	\$35,000	\$35,000	\$140,000
Customer Incentives	\$-	\$-	\$-	\$-	\$-	\$-
Administration	\$-	\$30,000	\$30,000	\$30,000	\$30,000	\$120,000
Marketing	\$-	\$5,000	\$5,000	\$5,000	\$5,000	\$20,000

Table 20: Program Cost Effectiveness

	<u>Value</u> <u>(\$1,000)</u>
TRC Test	
NPV Benefits	\$0
NPV Costs	\$106
Net Benefits	(\$106)
TRC Benefit/Cost Ratio	0.0

2.1.6 Community Based Organization (CBO) Marketing Program

Objectives

The Community Based Organization ("CBO") Marketing Program has several objectives:

1. Communicate and cross promote EE&C programs, such as the Appliance Recycling and Appliance Rebate Programs.
2. Communicate conservation programs and energy savings tips to UGI Electric customers.
3. Emphasize that there are many simple low-cost products to help customers' homes become more energy efficient.

Target Market

This program will be available to all UGI Electric residential customers.

Customer Eligibility Parameters

<u>Customer type</u>	<u>Residential/Low-income</u>
<u>Building Type</u>	<u>All</u>
<u>Building Vintage</u>	<u>All</u>
<u>Building ownership</u>	<u>Owner or tenant with owner approval</u>

Program Description

This program will be focused on marketing efforts facilitated by a CBO to cross-promote EE&C programs with the intent of driving increased customer awareness and participation. The marketing strategy may include, but not be limited to, the CBO developing and distributing specific UGI Electric EE&C marketing material and attending various community events and/or trade shows to further promote the availability of programs offered by UGI Electric.

Implementation Strategy

UGI Electric will utilize the services of the existing LIURP CBO(s) in the Electric Service territory to support and deliver the program.

Program Budget, Costs, and Cost-Effectiveness

Because this program is solely designed to act as a supplement to the remaining measures and does not provide an opportunity to discretely measure energy savings, the TRC value is assumed to be zero. The annual budget allocation is shown in the table below.

Table 20: Program Savings and Costs

Benefit/Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Savings (MWh)	-	-	-	-	-	-
Capacity Savings (MW)	-	-	-	-	-	-
Total Resource Cost	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
Direct Participant Cost	\$-	\$-	\$-	\$-	\$-	\$-
Direct Utility Costs	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
Customer Incentives	\$-	\$-	\$-	\$-	\$-	\$-
Administration	\$-	\$-	\$-	\$-	\$-	\$-
Marketing	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000

Funding will be allocated on an annual, per capita basis to LIURP administering agencies as referenced in the currently Commission-approved Universal Service and Energy Conservation Plan of the Company.

Table 21: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	\$0
NPV Costs	\$40
Net Benefits	(\$40)
TRC Benefit/Cost Ratio	0.0

2.2 Commercial and Industrial Sector Programs

2.2.1 Commercial and Industrial Custom Incentive Program

Objectives

The objectives of the Commercial and Industrial (“C&I”) Custom Incentive Program include:

1. Encourage the installation of high-efficiency equipment by UGI Electric’s C&I customers in new and existing facilities.
2. Encourage equipment repairs, optimization and operational or process changes that reduce electricity consumption.
3. Encourage a “whole facility” approach to energy-efficiency.
4. Increase customer awareness of the features and benefits of energy efficient equipment.
5. Increase the market penetration of high-efficiency equipment.
6. Support emerging technologies and non-typical efficiency solutions in cost-effective applications, including Combined Heat and Power applications.
7. Obtain approximately 189 projects through PY 12, with a total energy reduction of approximately 8,910 MWh.

Target Market

UGI Electric’s C&I Custom Incentive Program targets all new and existing commercial and industrial facilities, including government and municipal customers. The program will be available for any type of new or replacement energy-efficient equipment that is not eligible for a prescriptive rebate through UGI Electric’s other EE&C Programs. The program also covers retro-commissioning, repairs, optimization, and operational or process changes. All measures, packages of measures, and process changes must be cost-effective, as substantiated through a technical analysis.

The target market is the C&I sector, which includes governmental customers. UGI Electric expects to use a consistent implementation strategy, incentive mechanism, and administrative process to deliver the program across these market sectors. The table below outlines participant eligibility parameters for this measure.

Customer type	Commercial and Industrial
Building Type	Commercial and Industrial

Building Vintage	Existing and new construction
Building ownership	Owner or tenant with owner approval

Program Description

This Custom Incentive Program provides a delivery channel and financial incentives to customers installing a wide variety of custom measures suited to their business needs. To qualify for financial incentives, eligible customers will be required to provide documentation that their proposed efficiency upgrades pass UGI Electric’s cost-effectiveness threshold and technical criteria.

Implementation Strategy

The program CSP and UGI Electric Staff will work with customers to identify, evaluate and approve custom projects. UGI Electric will continue to build upon an outreach campaign to potential trade allies to promote the program.

Since the C&I Custom program is fluid by nature, the program CSP and UGI Electric will promote the program through a variety of marketing strategies. In addition, UGI Electric’s local area sales staff may reach out to C&I customers to inform them about program availability.

UGI Utilities, Inc. – Gas (North Rate District), which overlaps the UGI Electric service territory, also operates a custom retrofit program for commercial and industrial customers who wish to save natural gas through its subsidiary, UGI Penn Natural Gas, Inc. (“UGI-PNG”). For those UGI Electric commercial and industrial customers that are also UGI-Gas North Rate District-PNG customers, the Company will pursue an integration of the UGI Electric incentives with those offered for measures that save natural gas offered by UGI Gas North Rate District-PNG. This integration may include shared marketing materials, a common application process, single inspection for completed work, and/or a single rebate check.¹⁴

UGI Electric plans to retain its existing program CSP. The CSP will study the customer’s proposal and will provide an unbiased third-party opinion on feasibility, energy efficiency and savings, and the TRC project values. The CSP will operate on a performance basis, with compensation for program administration based on achieved kWh savings. Utilizing a qualified CSP with a performance contract ensures that projects meet TRC and QC standards.

The project development process for the Custom Incentive Program is more fluid than other programs and may not follow a precise work path. The following workflow is an example of a typical scenario through which an equipment-based custom efficiency project may proceed:

¹⁴ UGI Electric notes that subject to Commission approval of the proposed merger of UGI Utilities, Inc., UGI-PNG, and UGI Central Penn Gas, Inc. at Docket Nos. A-2018-000381, *et al.*, UGI-PNG will become the UGI North-rate zone of UGI Utilities, Inc.

1. Customers may be directed to the program through advertising efforts, or other UGI Electric EE&C programs.
2. A trade ally (e.g., energy services firms, engineering firms, providers of energy efficiency products and services, etc.) works with the customer to evaluate the facility's energy efficiency opportunities and develop potential project ideas.
3. A professional engineering firm or other qualified contractor, under contract with the customer, performs a detailed technical study of potential projects and evaluates their cost-effectiveness.
4. The program CSP will evaluate the customer's technical study report to qualify projects, which involves confirming project incremental cost, potential energy and capacity savings data, and evaluating cost-effectiveness.
5. Customers will schedule installation of eligible high-efficiency equipment upgrades, operational or process changes, or other eligible measures directly with an installation contractor of their choosing or the program CSP, if selected.
6. The CSP will verify equipment installation, operational, or process changes or other eligible work for all participants, which will be a part of the measurement and verification process.
7. The CSP will then process rebates for qualifying projects.
8. UGI Electric will require that rebate applications be submitted within 180 days of the measure's installation date.

Customer incremental costs (*i.e.*, the cost differential between standard and high-efficiency measures) will vary depending on the type of equipment and scope of project.

Marketing Strategy

UGI Electric will continue to work with the program CSP to find ways to increase customer awareness and participation during Phase III. UGI Electric and the program CSP will continue to refine and expand program outreach which may include, but not be limited to:

1. Communicating and providing access to program information on the Company's website.
2. Coordinating education opportunities with trade allies.
3. Utilizing program case studies in direct mail and/or email campaigns.

Eligible Measures and Incentive Strategy

UGI Electric will offer a custom incentive of up to \$0.18 per kWh saved and will maintain with an overall initial incentive level of \$0.10-2 per kWh, on average, over which continues the lifetime of levels used in the Plan current program design. UGI Electric will limit the rebate amount to the lesser of \$100,000 or 50% of the customer project cost. Projects must

save electricity and be cost-effective under the TRC Test (have a benefit-cost ratio of at least 1.0). Where possible, measure savings will be calculated using the current Act 129 TRM.¹²

UGI Electric will review the program and may adjust available measures or eligibility qualifications as warranted by changing market conditions or to manage program delivery, participation, and budgets.

Evaluation, Measurement, and Verification

UGI Electric will strive to continuously improve the success of its Plan to achieve program goals. UGI Electric and the CSP will enhance quality control, evaluate, measure and verify procedures to track program activities, monitor performance and progress toward targets, and take corrective action when warranted.

Quality control will be integral to the delivery of all programs in UGI Electric's Phase III EE&C Plan. QC measures will be deployed at various stages of program design and implementation to ensure the highest industry standards of operational efficiency. These measures will include, but will not be limited to, the following:

- Ongoing tracking of program activities and costs through dedicated UGI Electric Staff and various CSPs.
- Applying rigorous screening and qualifying protocols in engaging CSPs.
- Checking a significant percentage of custom projects to verify program compliance.

QC processes will strive to:

- Prevent errors from beginning to end in any given program process.
- Detect and correct errors as early as possible.
- Eliminate the causes of errors as well as the errors themselves.
- Establish a correction plan based on best practices and lessons learned.

The program CSP and UGI Electric Staff will track all the data necessary to verify program activities and outcomes. For the C&I Custom program, this data may include:

- Participant information: account number, rate class, copy of most recent electric bill, EE&C customer segment, and contact information.
- Project information: site (facility) location, project specifications, total project cost, project application date, project approval date, and project completion date.
- Measure information: make and model number of new appliances/appliance, type and quantity of measures installed, efficiency rating, and service rendered.

¹² UGI Electric will continue to use the Phase III Act 129 TRM until the Phase IV Act 129 TRM is made available and adopted.

- Expenditures and energy savings.
- Trade ally information, if available: contact information, dates of program involvement, and installation standards used.
- New construction information: developer contact information, builder contact information, and confirmation of new account activation.

Before issuing a customer rebate, UGI Electric will make a determination of cost-effectiveness based on the customer's invoiced costs and the savings derived from the Act 129 TRM.

UGI Electric will continue to track and evaluate actual project savings and calculate an analysis of realized savings at the end of each program year. Such tracking and evaluation of actual project savings will be performed in a manner that allows the Company to determine estimated annual pre-usage and estimated annual post-usage and then calculate the difference between pre- and post-usage and estimated annual post-usage and then calculate the difference between pre- and post-usage to get realized savings, with the realization rate calculated by dividing this value by the projected savings for the project. The three methods the Company may use to determine pre- and post-usage are raw usage comparison, baseload usage comparison, and adjusted usage comparison.

Estimated Participation

Participation levels were estimated based on experience with this program over the past two years.

Table 2219: Projected Participation

Project	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Small C&I Project	20	25	30	30	30	135
Large C&I Project	8	10	12	12	12	54
Total	28	35	42	42	42	189

Program Budget, Costs, and Cost-Effectiveness

Over the five-year Plan, the program is expected to achieve electricity consumption savings of approximately 8,910 MWh. Over the five-year term of the Phase III EE&C Plan, the overall incentive spending shall be limited to \$100 per first year MWh, and the overall non-incentive spending shall be limited to \$110 per first year MWh. UGI Electric's internal EE&C staff expenses are not assigned to the C&I Custom Incentive program and, therefore, are not included in the calculation of the annual non-incentive spending cost limit. The annual and Phase III to-date incentive and non-incentive spending values on a per first year MWh basis will be included in the Company's annual reports. The annual budget allocation, savings, and overall program cost-effectiveness for the program are shown below.

~~The annual budget allocation, savings, and overall program cost-effectiveness for the program are shown below.~~

Table 2320: Program Savings and Costs

Benefit/Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	Total
Savings (MWh)	1.320	1.650	1.980	1.980	1.980	8.910
Capacity Savings (MW)	0.157	0.196	0.235	0.235	0.235	1.059
Total Resource Cost	\$620,341 \$708,956	\$781,411,876,430	\$947,122,049,544	\$960,802,063,224	\$974,738,077,160	\$4,284,414,775,344
Direct Participant Cost	\$337,956 \$311,556	\$433,400,430	\$533,544,93,944	\$547,224,507,624	\$561,160,521,560	\$2,413,314,235,144
Direct Utility Costs	\$282,385 \$397,400	\$347,981,476,000	\$413,578,555,600	\$413,578,555,600	\$413,578,555,600	\$1,871,100,254,200
Customer Incentives	\$132,000 \$158,400	\$165,498,000	\$198,000,237,600	\$198,000,237,600	\$198,000,237,600	\$891,000,069,200
Administration	\$130,385 \$159,000	\$162,981,498,000	\$195,578,238,000	\$195,578,238,000	\$195,578,238,000	\$880,100,071,000
Marketing	\$2080,000	\$2080,000	\$2080,000	\$2080,000	\$2080,000	\$100400,000

Table 24: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	\$5.634
NPV Costs	\$3.311
Net Benefits	\$2.323
TRC Benefit/Cost Ratio	1.70

Table 21: Program Cost Effectiveness

TRC Test	Value (\$1,000)
NPV Benefits	-\$1.694
NPV Costs	-\$3.694
Net Benefits	-\$1.000
TRC Benefit/Cost Ratio	-1.27

Other Information

Customers who submit qualified and approved projects to UGI Electric will receive a budget commitment for their proposal. Receipt of the rebate is contingent on project completion during the life of the Plan and the availability of program funding. Customers submitting projects to UGI Electric will be placed on a waiting list for a potential Phase IV if funding runs out prior to the end of the Phase III EE&C Plan.

|

2.3—Crosscutting Programs

2.3.1—Emerging Technology and Outreach (ETO) Program

Objectives

The Emerging Technology and Outreach Program is designed to engage with customers across multiple programs and platforms and to promote new and emerging technologies and energy saving techniques. This program also will serve as a way for UGI Electric to test future program strategies and offerings that may eventually lead to additional stand-alone programs.

Target Market

The Emerging Technologies and Outreach program targets all of UGI Electric's residential (including low-income), small C&I, and large C&I customers. The program may specifically target some harder-to-reach customer groups, such as low-income customers, manufactured homes, small businesses, or government and non-profit entities.

Customer Eligibility Parameters

Customer type	All
Building Type	All
Building Vintage	All
Building ownership	Owner or tenant

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Program Description

The Emerging Technologies and Outreach Program will fund crosscutting marketing activities for existing programs and pilot projects for new and emerging technologies or saving techniques. Generally, the program offerings will come at no cost to participating customers.

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Implementation Strategy

The Emerging Technologies and Outreach Program is designed as a flexible option for UGI Electric to raise customer awareness of existing programs, as well as a way to explore new savings opportunities as they come up in the future. UGI Electric will conduct market research and monitor activity by other leading electric energy efficiency providers, both inside and outside Pennsylvania, to develop program initiatives. UGI Electric will develop new initiatives as opportunities arise and barriers to success for the portfolio and other programs are identified.

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Eligible Measures and Incentive Strategy

There are three main categories of initiatives that UGI Electric may pursue under the ETO Program, which are described in the table below:

Program Initiatives

Category	Description	Example Initiatives
Crosscutting Marketing	Marketing activities that cut across multiple existing programs and work to further UGI Electric's overall efficiency message.	<ul style="list-style-type: none"> ● Online audit through which customers can be steered to existing programs relevant to their needs. ● Neighborhood canvassing to drive participation in all programs. ● Energy efficiency kits and education for low income customers.
Behavioral Opportunities	Approaches to savings energy through changing customer behavior.	<ul style="list-style-type: none"> ● Targeted home energy reports to include high use and/or low income customers. ● Online rewards program for pursuing efficiency. ● Commercial building benchmarking assistance.
New and Emerging Technology	Direct installation of, or incentives for, new and emerging technologies that may not yet have fully vetted savings under Act 129's TRM.	<ul style="list-style-type: none"> ● Residential connected lighting controls. ● Direct install of solar water heaters for manufactured homes. ● Energy saving initiatives for farms and dairies.

UGI Electric will review results from this program and determine whether any adjustments are needed to maintain Plan cost effectiveness.

Evaluation, Measurement, and Verification

UGI Electric will conduct an internal audit and review of customer outreach materials. UGI will collect and maintain activity relating to all initiatives such as invoice amounts, participant data, activity dates, and descriptions.

For initiatives where savings may be claimed, UGI Electric will use pre/post billing analysis to determine any energy impacts.

Administrative Requirements

UGI Electric Staff will oversee this program and any CSP hired to implement specific pilot projects.

Program Budget, Costs, and Cost Effectiveness

The annual budget allocation is shown in the table below. UGI Electric is allocating approximately 80% of the five year budget to the residential customers and approximately 20% to commercial and industrial customers, based on anticipated activity.

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Table 22: Program Savings and Costs:

Benefit/Cost Component	Y-8	Y-9	Y-10	Y-11	Y-12	Total
Savings (MWh)	-	-	-	-	-	-
Capacity Savings (MW)	-	-	-	-	-	-
Total Resource Cost	-\$120,000	-\$120,000	-\$120,000	-\$120,000	-\$120,000	-\$600,000
Direct Participant Cost	-\$	-\$	-\$	-\$	-\$	-\$
Direct Utility Costs	-\$120,000	-\$120,000	-\$120,000	-\$120,000	-\$120,000	-\$600,000
Customer Incentives	-\$	-\$	-\$	-\$	-\$	-\$
Administration	-\$	-\$	-\$	-\$	-\$	-\$
Marketing	-\$120,000	-\$120,000	-\$120,000	-\$120,000	-\$120,000	-\$600,000

Table 23: Program Cost Effectiveness

	Value
TRC Cost	(\$1,000)
NPV Benefits	-\$
NPV Costs	\$171
Net Benefits	\$(171)
TRC Benefit/Cost Ratio	-

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Other Information

The Emerging Technology and Outreach Program is designed to act as a supplement to and enhancement of other existing programs. Accordingly, no savings or benefits are being projected for the program at this time. However, if program activity in the future has verifiable savings or benefits (such as a from a direct install or behavior pilot project), the Company will provide savings and cost effectiveness results in future annual reports.

3 Cost Effectiveness of Plan and Sector Summaries

UGI Electric designed its Phase III EE&C Plan to offer programs that, as a whole, meet the TRC Test. The overall Phase III EE&C Plan is cost-effective according to the TRC guidelines established by the Commission.

UGI Electric's analysis indicates a TRC benefit-to-cost ratio of 1.4848 for the overall Phase III portfolio. The analysis reveals that for the complement of Residential Programs, the TRC Benefit/Cost Ratio is 1.9052. The TRC Benefit/Cost Ratio for the Commercial and Industrial Programs is 1.7024. This benefit-to-cost ratio is more than the 1.0 minimum TRC Test parameter applied to the EE&C Plans in the Act 129 proceedings. The summary of the Plan's cost effectiveness is provided in the table below.

Table 2524: Cost Effectiveness/Net Benefits Summary

Customer Class	TRC PV Benefits	TRC PV Costs	TRC PV Net Benefits	TRC Benefit-Cost Ratio
Residential*	\$5,087,589.423,512	\$2,670,842,901.42	\$2,416,747.522,09	1.9052
C&I*	\$5,634,258.4693,978	\$3,310,764,788.25	\$2,323,494,905.725	1.7024
Portfolio-wide	\$0	\$1,241,206,059.67	(\$1,241,206,059.67)	N/A
Total	\$10,721,847.9117,49	\$7,222,812,749.34	\$3,499,035.1368,14	1.4848

*Includes Emerging Technology and Outreach Program allocation

The TRC Test methodology used follows the Act 129 Phase III TRC Test order. Present value figures are provided in 2018 dollars. Any participant costs shown are net of incentives. The analysis used a real discount rate ("RDR") of 5.56%. The RDR was calculated using an assumption of a nominal discount rate ("NDR") of 7.53%, based on UGI Electric's weighted average cost of capital ("WACC"), and an inflation rate of 1.87%. The avoided costs used for the analysis are those utilized by PPL Electric in its Act 129 Phase III EE&C Plan, and can be found in Appendix A.

To the extent that the Phase III EE&C Plan is set to continue for the full five-year term, UGI Electric will file an update to this Plan within the three months following the Commission's issuance of its Phase IV TRC Test Order. This update will include revised projections for PY 11 and PY 12 using the electric avoided costs established for PPL Electric for Phase IV of Act 129.

4 Implementation Strategy

UGI Electric anticipates that it will leverage a combination of internal staff and CSPs, to accomplish the goals of its Phase III EE&C Plan. For continuity purposes, UGI Electric intends to utilize its existing CSPs for Phase III; however, UGI the Company will utilize an RFP process to find and employ new CSPs as needed. UGI Electric has appropriately incorporated administrative costs into its Phase III EE&C Plan budget. The following table provides annual projections for portfolio-wide administration costs by category.

Table 2625: Portfolio-wide Costs by Category and Year

Cost Component	PY 8	PY 9	PY 10	PY 11	PY 12	PY 8 - 12
Internal Labor and Other Resources	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$750,000
Tracking, Planning and Reporting	\$100,000	\$100,000	\$100,000	\$250,000	\$100,000	\$750,000
Miscellaneous Admin	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$100,000
Total Cost	\$270,000	\$270,000	\$270,000	\$520,000	\$270,000	\$1,600,000

Administrative costs for UGI Electric's Phase III EE&C Plan constitute approximately \$1.6035 million over five years, or 25.148.7% of the total Plan budget. These costs were developed based on UGI Electric's best estimate and available information regarding the energy efficiency programs contained in its Plan, as well as \$250,000 for a full plan evaluation in PY 11 if the Phase III EE&C is set to continue for the full five-year term.

Reporting

UGI Electric will continue to submit an EE&C Plan Annual Report by August 31st, no later than three months after the close of each program year. The reports will follow the same format as previous reports and include information on activity for the previous year and progress towards five-year goals, including, but not limited to:

- Spending
- Savings
- Participation
- Cost-effectiveness
- Highlights of portfolio and program activity
- Updates to program delivery and design

To tie savings and costs together as effectively as possible, results will be reported based on commitments made. Any measures that have been verified as installed within a program year along with any costs committed to these measures, including administration costs, will be counted for that Plan year.

5 Phase III Energy Efficiency and Conservation Rider

For Phase III, UGI Electric proposes an annual average budget of approximately \$1.2844 million, which equates to a maximum of ~~\$6.397.22~~ million over the five years of the Plan. The budget includes the annual spending limits for the sectors, as well as the Company's annual administrative costs to implement and administer Phase III of the Plan each year. UGI Electric proposes to limit its absolute annual spending on the EE&C portfolio to 2% of its jurisdictional revenues for the twelve months ending May 31, 2008, or \$2.5 million, while maintaining a five-year spending cap of ~~\$6.397.22~~ million.

Consistent with the Commission's Secretarial Letter, UGI Electric proposes a Section 1307 mechanism to recover the budgeted costs for administration of Phase III of the Plan. Phase III EE&C Plan cost recovery will be accomplished utilizing the Phase III EEC Rider, described more fully below.

Act 129 requires larger EDCs to recover the costs of their EE&C plans through a reconcilable adjustment clause under Section 1307 of the Public Utility Code. See 66 Pa. C.S. § 2806.1(k)(1). In its *Phase III Implementation Order*, the Commission reemphasized this requirement and directed EDCs to implement "an annual cost recovery methodology based on the projected program costs that the EDC anticipates will be incurred over the surcharge application year to attain the energy reduction targets." *Phase III Implementation Order*, at p. 149. This Section 1307 surcharge would be annually reconciled annually based on the "actual expenses incurred" compared to "actual revenues received for the reconciliation period." *Id.*

Although UGI Electric is not subject to the Act 129 requirements and orders, the Company proposes to recover the costs of its Phase III EE&C Plan through a reconcilable Phase III EEC Rider established under Section 1307 of the Public Utility Code, consistent with Act 129 and the Commission's *Phase III Implementation Order*. The Phase III EEC Rider is reflected in the distribution charges for each customer class, rather than appearing as a separate line item on customers' bills.

The costs that will be recovered by the Phase III EEC Rider consist of all the costs of creating, designing, and implementing the Phase III EE&C programs included in the Plan, which include, but are not limited to: (1) labor costs incurred to manage and administer the programs on an ongoing basis; (2) the cost to measure and verify program results; and (3) the cost of incentives offered to customers to participate in the programs.

UGI Electric will recover the expenditures incurred under the Phase III EE&C Plan on a year-to-year basis. As a result, the Phase III EEC Rider was designed to track actual yearly expenditures. Act 129 and the Secretarial Letter require that EE&C programs be supported by the same customer classes that will receive the direct energy and conservation benefits of those programs. 66 Pa. C.S. § 2806.1(a)(11). Accordingly, under UGI Electric's Plan, the costs of Phase III EE&C programs that target specific customer classes are directly assigned to those classes for purposes of developing the recovery charges. UGI Electric will, therefore, continue to separately calculate the applicable EE&C costs and revenues for each

of the major customer classes on its system, including: (1) residential; (2) small non-residential; and (3) large non-residential including governmental customers.

The Company will adjust the Phase III EEC Rider for actual program expenses and revenues each year. UGI Electric also will submit a filing to reconcile previous revenues and expenses and will propose new rates effective for the subsequent year based on the projected budget and sales for that planning year, as well as to account for over and under collections incurred for the previous year. Any resulting over/under collections existing as of the last year of the Phase III EE&C Plan will be recovered/refunded over the one-year period following the end of the Final Reconciliation Year. If it is known that there will be a Phase IV EE&C Plan at the end of the Final Reconciliation Year related to Phase III, any remaining balance will be recovered/refunded through the Phase IV EEC Rider's E-Factor. If there will be no Phase IV EE&C Plan, any balance remaining for a customer class at the end of the Final Reconciliation Year will be trued up through a one-time bill credit issued to the applicable customers during the second full billing month following the end of the Final Reconciliation Year.

Appendix A – Program Costs and Savings by Year

Table 26: Utility Costs (Nominal \$)

Program	PY 8	PY 9	PY 10	PY 11	PY 12	PY 8 - PY 12
Appliance Recycling	\$140,400	\$140,400	\$140,400	\$140,400	\$140,400	\$702,000
Appliance Rebates	\$250,150	\$250,150	\$250,150	\$246,850	\$246,850	\$1,244,150
Energy Efficient Lighting	\$141,213	\$-	\$-	\$-	\$-	\$141,213
School Energy Program	\$139,031	\$124,850	\$124,850	\$124,850	\$124,850	\$638,431
Residential Low-Income Program C&I-Custom	\$- \$397,400	\$35476,000	\$35,000,555 .600	\$35,000,555 5.600	\$35,000,555 .600	\$140,000,2.54 0.200
CBO Marketing Program Emerging Technology and Outreach	\$10420,000	\$10420,000	\$10420,000	\$10420,000 0	\$10420,000	\$50600,000
C&I Custom	\$282,385	\$347,981	\$413,578	\$413,578	\$413,578	\$1,871,100
Portfolio-wide Administration	\$270,000	\$270,000	\$270,000	\$520270,0 00	\$270,000	\$1,600350,00 0
Total Portfolio	\$1,233,1794 58,194	\$1,178,381, 400	\$1,243,978 461,000	\$1,490,67 8457,700	\$1,240,678 457,700	\$6,386,8947, 215,994

Table 27: Incremental First Year Savings (kWh)

Program	PY 8	PY 9	PY 10	PY 11	PY 12	PY 8 - PY 12
Appliance Recycling	634,704	634,704	634,704	634,704	634,704	3,173,521
Appliance Rebates	656,183	656,183	656,183	644,911	644,911	3,258,371
Energy Efficient Lighting	1,423,302	-	-	-	-	1,423,302
School Energy Program	371,941	245,806	245,806	245,806	245,806	1,355,164

Residential Low-Income Program	-	-	-	-	-	-
CBO Marketing Program	-	-	-	-	-	-
C&I Custom	1,320,000	1,650,000	1,980,000	1,980,000	1,980,000	8,910,000
Emerging Technology and Outreach	-	-	-	-	-	-
Total Portfolio	4,406,131	3,186,693	3,516,693	3,505,421	3,505,421	18,120,358
<i>% of 2008 Sales</i>	<i>0.41%</i>	<i>0.30%</i>	<i>0.33%</i>	<i>0.33%</i>	<i>0.33%</i>	<i>1.69%</i>

Appendix B – Avoided Costs

Table 28: (2018\$)

Year	Electricity				Summer Gener. Capacity	Trans. Capacity	Dist. Capacity	Natural Gas			Other Water
	Summer Peak Energy	Summer Off-Peak Energy	Winter Peak Energy	Winter Off-Peak Energy				NG Base	NG Space Heat	NG DHW	
	\$/kWh	\$/kWh	\$/kWh	\$/kWh	\$/kW-yr.	\$/kW-yr.	\$/kW-yr.	\$/MMBtu	\$/MMBtu	\$/MMBtu	\$/gal
2019	-\$0.04240355	\$0.03240225	\$0.06830408	\$0.04870349	\$45.24	\$0.00	\$21.15	\$4.725	\$9.809	\$5.996	\$0.0083
2020	-\$0.04410328	\$0.03270244	\$0.06840390	\$0.04880294	\$45.24	\$0.00	\$21.16	\$5.024	\$10.105	\$6.294	\$0.0083
2021	-\$0.04460323	\$0.03300214	\$0.06850375	\$0.04870294	\$45.25	\$0.00	\$21.15	\$5.512	\$10.611	\$6.787	\$0.0083
2022	-\$0.04500348	\$0.03320209	\$0.06840372	\$0.04860294	\$45.25	\$0.00	\$21.15	\$6.042	\$11.164	\$7.323	\$0.0083
2023	-\$0.04500322	\$0.03310214	\$0.06800377	\$0.04830295	\$45.25	\$0.00	\$21.15	\$6.246	\$11.356	\$7.524	\$0.0083
2024	-\$0.04480364	\$0.03290239	\$0.06730427	\$0.04780334	\$45.25	\$0.00	\$21.16	\$6.602	\$11.715	\$7.880	\$0.0083
2025	-\$0.07200394	\$0.05050257	\$0.07580458	\$0.05290250	\$45.25	\$0.00	\$21.15	\$7.097	\$12.235	\$8.381	\$0.0083
2026	-\$0.07660448	\$0.05340274	\$0.08010490	\$0.05570384	\$45.25	\$0.00	\$21.15	\$7.823	\$13.017	\$9.122	\$0.0083
2027	-\$0.08070445	\$0.05600293	\$0.08310523	\$0.05760410	\$45.25	\$0.00	\$21.15	\$7.765	\$12.938	\$9.058	\$0.0083
2028	-\$0.08310472	\$0.05750340	\$0.08650554	\$0.05970424	\$45.25	\$0.00	\$21.15	\$7.810	\$12.973	\$9.101	\$0.0083
2029	-\$0.08690504	\$0.05990234	\$0.09080595	\$0.06250466	\$45.25	\$0.00	\$21.15	\$7.860	\$13.014	\$9.149	\$0.0083
2030	-\$0.09150525	\$0.06290254	\$0.09450630	\$0.06480494	\$45.25	\$0.00	\$21.15	\$7.856	\$12.994	\$9.140	\$0.0083
2031	-\$0.09460548	\$0.06480260	\$0.09580646	\$0.06560506	\$45.25	\$0.00	\$21.16	\$7.796	\$12.914	\$9.075	\$0.0083
2032	-\$0.09470554	\$0.06480262	\$0.09150649	\$0.06280508	\$45.24	\$0.00	\$21.15	\$7.825	\$12.932	\$9.101	\$0.0083
2033	-\$0.08800552	\$0.06040363	\$0.08990650	\$0.06170509	\$45.24	\$0.00	\$21.15	\$7.751	\$12.837	\$9.022	\$0.0083

2034	-\$0.08940554	\$0.06130364	\$0.09080653	\$0.06220511	\$45.25	\$0.00	\$21.16	\$7.725	\$12.795	\$8.992	\$0.0083
					\$56.213	\$27.549	\$78.431				
2035	-\$0.08990559	\$0.06150367	\$0.09220659	\$0.06300516	\$45.25	\$0.00	\$21.15	\$7.673	\$12.726	\$8.937	\$0.0083
					\$56.213	\$27.549	\$78.431				
2036	-\$0.09180574	\$0.06270377	\$0.09440676	\$0.06440529	\$45.25	\$0.00	\$21.16	\$7.656	\$12.694	\$8.916	\$0.0083
					\$56.213	\$27.549	\$78.431				
2037	-\$0.09420576	\$0.06420378	\$0.09640678	\$0.06570531	\$45.25	\$0.00	\$21.15	\$7.575	\$12.592	\$8.829	\$0.0083
					\$56.213	\$27.549	\$78.431				
2038	-\$0.09600586	\$0.06540385	\$0.09860690	\$0.06700540	\$45.25	\$0.00	\$21.15	\$7.499	\$12.496	\$8.748	\$0.0083
					\$56.213	\$27.549	\$78.431				
2039	-\$0.09830593	\$0.06680389	\$0.10330698	\$0.07000547	\$45.25	\$0.00	\$21.15	\$7.584	\$12.577	\$8.832	\$0.0083
					\$56.213	\$27.549	\$78.431				
2040	-\$0.09830597	\$0.06680392	\$0.10330703	\$0.07000551	\$45.25	\$0.00	\$21.16	\$7.593	\$12.575	\$8.838	\$0.0083
					\$56.213	\$27.549	\$78.431				

Electric avoided costs from the Pennsylvania Act 129 Statewide Evaluator's 2015 Statewide Potential Study values for PPL developed by Resource Insights Inc.

Natural gas and water avoided costs from UGI Penn Natural Gas, Inc "Five Year Energy Efficiency and Conservation Plan (January 19, 2017) - Appendix 3.1, inflated to 2018 dollars

Appendix C – Key Measure Assumptions

Table 29: Measure Characterizations

Program	Measure Name	Measure Life (Yr.)	Measure Cost	First Year Savings		Fossil Fuels (MMBtus)	Water (Gallons)
				Energy (kWh)	Demand (kW)		
Appliance Recycling	Fridge	8	\$50.00	1,146	0.13	-	-
Appliance Recycling	Freezer	8	\$50.00	1,015	0.11	-	-
Appliance Recycling	Room AC	4	\$20.00	112	0.26	-	-
Appliance Recycling	Dehumidifier	4	\$20.00	735	0.18	-	-
Appliance Rebates	CAC - 16 SEER	14	\$571.93	205	0.37	-	-
Appliance Rebates	ENERGY STAR Room AC	9	\$20.00	9	0.02	-	-
Appliance Rebates	Ductless Mini split Heat Pump	15	\$480.08	743	0.23	-	-
Appliance Rebates	ENERGY STAR Fridge	12	\$13.24	51	0.01	-	-
Appliance Rebates	ENERGY STAR Clothes Washer	11	\$19.19	60	0.01	0.22	1,659
Appliance Rebates	ENERGY STAR Dishwasher	10	\$10.00	41	0.00	0.05	490
Appliance Rebates	ENERGY STAR Dehumidifier	12	\$5.00	147	0.04	-	-
Appliance Rebates	Pool Pump w/ VFD	10	\$549.00	1,409	0.34	-	-
Appliance Rebates	ENERGY STAR Thermostat (Electric Heating)	11	\$154.00	1,010	-	-	-
Appliance Rebates	ENERGY STAR Thermostat (Gas Heating)	11	\$154.00	98	-	4.19	-
Appliance Rebates	Electric Heating to Gas Heat	20	\$4,850.00	23,706	-	(60.95)	-
School Energy Program	Middle School Kit (w/ LEDs)	11.1	\$62.78	220	0.03	3.72	1,722
School Energy Program	Middle School Kit (w/o LEDs)	8.6	\$53.00	133.27	0.02	3.72	1,722
School Energy Program	High School Kit (w/ LEDs)	9.0	\$102.78	337	0.04	3.72	1,722
School Energy Program	High School Kit (w/o LEDs)	6.9	\$93.00	250	0.03	3.72	1,722
Energy Efficient Lighting	ENERGY STAR LED	15	\$2.54	38	0.00	-	-
Energy Efficient Lighting	ENERGY STAR LED - Giveaway	15	\$3.26	32	0.00	-	-
C&I Custom	Small C&I Custom Project	15	\$12,427.28	38,000	3.38	-	-
C&I Custom	Large C&I Custom Project	15	\$26,152.05	70,000	11.16	-	-

Table 30: Measure Cost Effectiveness

TRC Test

Program	Measure Name	PV Benefits	PV Cost	PV Net	BCR
				\$777,952,634.6	
Appliance Recycling	Fridge	\$863,314,719.978	\$85,362	46	10.11-8.43
Appliance Recycling	Freezer	\$191,505,160.188	\$21,586	02	8.87-7.42
Appliance Recycling	Room AC	\$18,419,372.297	\$4,317	\$14,132,32,980	4.27-8.64
Appliance Recycling	Dehumidifier	\$17,082,18,925	\$1,962	\$15,120,16,962	8.70-9.64
				=	
				\$29,970\$12,41	
Appliance Rebates	CAC - 16 SEER	\$53,507,95,895	\$83,477	8	0.64-1.15
Appliance Rebates	ENERGY STAR Room AC	\$10,532,20,393	\$15,013	-\$1,481\$5,380	0.70-1.36
Appliance Rebates	Ductless Mini split Heat Pump	229,793,251,683	172,175	\$57,618,79,508	-1.33-46
Appliance Rebates	ENERGY STAR Fridge	\$32,184,26,740	\$13,806	\$18,379,12,935	2.33-1.94
				\$113,104,11.6	
Appliance Rebates	ENERGY STAR Clothes Washer	\$127,505,126,038	\$14,402	36	-8.85-75
Appliance Rebates	ENERGY STAR Dishwasher	\$44,984,42,023	\$7,197	\$37,787,34,826	6.25-5.84
Appliance Rebates	ENERGY STAR Dehumidifier	\$32,234,805	\$1,668	\$30,566,31,137	-19.32-67
Appliance Rebates	Pool Pump w/ VFD	\$16,181,624	\$11,577	\$4,604,5,046	-1.40-44
Appliance Rebates	ENERGY STAR Thermostat (Electric Heating)	\$106,080,63,983	\$32,111	\$73,969,31,873	3.30-1.99
Appliance Rebates	ENERGY STAR Thermostat (Gas Heating)	\$130,654,126,750	\$32,111	\$98,544,94,640	4.07-3.95
				\$217,664-	
Appliance Rebates	Electric Heating to Gas Heat	\$622,175,170,191	\$404,511	\$234,320	1.54-0.42
				\$292,847,285.1	
School Energy Program	Middle School Kit (w/ LEDs)	\$335,226,327,523	\$42,379	44	-7.91-73
School Energy Program	Middle School Kit (w/o LEDs)	\$1,302,087,276,378	\$166,408	.970	-7.82-67
				\$128,851,123.5	
School Energy Program	High School Kit (w/ LEDs)	\$162,050,156,743	\$33,199	44	-4.88-72
School Energy Program	High School Kit (w/o LEDs)	\$630,734,611,802	\$131,399	02	-4.80-66
				\$163,991,145.5	
Energy Efficient Lighting	ENERGY STAR LED+	\$150,357,131,943	-\$13,633	76	(9.68)
Energy Efficient Lighting	ENERGY STAR LED - Giveaway	\$20,220,18,878	\$10,143	\$10,077,8,735	-1.99-86
				\$1,772,499,107	
C&I Custom	Small C&I Custom Project	\$3,157,537,2,492,055	\$1,385,038	.017	2.28-1.80

C&I Custom	Large C&I Custom Project	\$2,476,721	201,923	\$1,165,873	\$1,310,848	036	2,124.89
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+ Deferral credit for shifting baseline leads to negative cost and BCR. Measure is still cost-effective, given positive net benefits.